

DOCKETED

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Description:	2025 Burrowing Owl and Crotch's Bumble Bee Survey Results
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MEMORANDUM

To: Renee Robin, Compass Energy Storage LLC
From: Kimberly Narel, Biologist, Dudek
Subject: Compass BESS Project – 2025 Burrowing Owl and Crotch’s Bumble Bee Survey Results
Date: August 8, 2025
cc: Tommy Molioo, Senior Biologist, Dudek
Erin Phillips, Project Manager, Dudek
Attachments: Figures 1 and 2
A – Species Compendium
B – Photo Log
C – Resumes

This memorandum documents the methods and results of focused surveys for burrowing owl (*Athene cunicularia*) and Crotch’s bumble bee (*Bombus crotchii*) in support of the Compass Battery Energy Storage System Project (project). Although focused surveys for both species were conducted for the project in 2024 and the results were negative, per the California Energy Commission (CEC) Post Scoping Biological Resources Data Requests received June 27, 2025, additional surveys were conducted in the summer of 2025 in order to conduct the surveys according to full protocol.

Site Description

The project is located on the grounds of the Saddleback Church in San Juan Capistrano, within a valley between the Santa Ana Mountains to the northeast and the Laguna Woods to the west, at an elevation of approximately 185 to 210 feet above mean sea level (Figure 1, Project Location). The project site contains existing development associated with the church grounds, including agricultural land and a pollinator garden, and undeveloped lands including non-native grassland and upland coastal sage scrub. The eastern boundary of the project is bordered by Oso Creek, which supports mature riparian woodland and flowing water. Vegetation communities and land covers on the project include Fremont cottonwood (*Populus fremontii*)–arroyo willow (*Salix lasiolepis*) riparian woodland, mulefat thickets, ornamental vegetation, upland mustards, urban/developed, and agricultural lands. Suitable habitat for burrowing owl and Crotch’s bumble bee occurs primarily within the agricultural lands, non-native grassland, and surrounding scrub habitats.

Species Accounts

Burrowing Owl

Burrowing owl is a California Species of Special Concern and is currently under consideration by the California Fish and Wildlife Commission to be a candidate species for listing as endangered or threatened under the California Endangered Species Act (CESA). Candidate species are given the same protections as listed species until the final decision is made.

In California, burrowing owls are year-round residents of open, dry grassland and desert habitats and grass, forb, and open shrub stages of pinyon–juniper and ponderosa pine habitats (Zeiner et al. 1990). Their preferred habitat is generally typified by short, sparse vegetation with few shrubs, level to gentle topography, and well-drained soils (Poulin et al. 2011).

The presence of burrows is the most essential component of burrowing owl habitat because burrows (typically 11 centimeters or larger) are required for nesting, roosting, cover, and catching prey. In California, burrowing owl most commonly lives in burrows created by California ground squirrels (*Otospermophilus beecheyi*). Burrowing owls may occur in human-altered landscapes such as agricultural areas, ruderal grassy fields, vacant lots, and pastures if the vegetation structure is suitable (i.e., open and sparse), usable burrows are available, and foraging habitat occurs in close proximity (Gervais et al. 2008). In addition, debris piles, riprap, culverts, and pipes can be used for nesting and roosting, and burrowing owls may take up residence in these areas at any time of the year.

Crotch's Bumble Bee

Crotch's bumble bee is not listed as threatened or endangered in California; however, it is a candidate species for listing under CESA and therefore is afforded the same protection status as fully listed species. This invertebrate species occurs almost exclusively in California, where it inhabits open grassland and scrub habitats from southern to central California. Most bumble bees, including Crotch's bumble bee, nest in the ground in cavities such as abandoned rodent burrows, holes in building foundations, or stacks of woody debris. Bumble bees, including Crotch's bumble bee, are generalist foragers and have been reported visiting a wide variety of flowering plants. Crotch's bumble bee has a very short tongue and is therefore best suited to forage at open flowers with short corollas. Nectar plants known to be visited by Crotch's bumble bee include the genera *Acmispon*, *Asclepias*, *Chaenactis*, *Lupinus*, *Medicago*, *Phacelia*, and *Salvia* (Xerces 2023; Williams et al. 2014), but it is assumed flowering plants in other genera could also support foraging by this species.

Mated gynes (future founding queens) overwinter in soil cavities and emerge in the early spring to begin new colonies, provisioning their young with pollen and nectar (Xerces 2023; CDFW 2023). As the spring season progresses, workers (small female nonreproductive bees) are produced in increasing numbers and escalate the provisioning of the colony. The colony continues to grow until early to mid-summer, when new males (from unfertilized eggs) are produced along with the new generation of future queens. Workers and males live for only a few weeks. Thus, overall Crotch's bumble bee numbers are highest (include workers and males) in late spring through mid-summer seasons, very low in fall and early spring (gynes only), and virtually undetectable during the overwintering season (when dormant underground).

Methods

Literature Review

Prior to beginning the focused surveys, a literature review was conducted to identify special-status biological resources present or potentially present in the vicinity of the project using the California Natural Diversity Database (CDFW 2025) including the U.S. Geological Survey 7.5-minute San Juan Capistrano quadrangle, in which the project resides, and the five surrounding 7.5-minute U.S. Geological Survey quadrangles. According to the California Natural Diversity Database, there are no on-site occurrence records of burrowing owl or Crotch's bumble bee.

Burrowing Owl Surveys

Additional late-breeding-season burrowing owl surveys were conducted in 2025 to determine if any owls are currently occupying the project and surrounding 500-meter buffer and to identify any suitable burrows to support nesting activity. Suitable habitat for burrowing owl on the project includes portions of rock riprap along Oso Creek, non-native grassland, agricultural land, and coastal sage scrub habitats. The burrowing owl surveys were conducted in accordance with the Staff Report on Burrowing Owl Mitigation (CDFG 2012). Per CEC recommendation, three passes were conducted in July 2025, spaced 2 weeks apart. Surveys were conducted by Dudek biologist Kimberly Narel during the burrowing owl breeding season (February 1–August 31). The surveys were conducted when conditions were suitable for detecting owls (no rain, high winds [greater than 20 miles per hour], dense fog, or temperatures over 90 °F). Survey dates and conditions are listed in Table 1. Per CEC's June 27, 2025 request, three focused burrowing owl survey passes spaced at least 2 weeks apart were conducted before July 31 in suitable habitat within the project plus a 500-meter buffer.

Table 1. Survey Conditions

Date	Hours	Survey	Biologist	Conditions (temperature, cloud cover, wind speed)
07/03/2025	0700–1000	BUOW Pass 1	KN	61°F–67°F, 100%–50% cc, 1–7 mph
07/17/2025	0700–1000	BUOW Pass 2	KN	63°F–73°F, 0%–10% cc, 0–3 mph
07/31/2025	0700–1000	BUOW Pass 3	KN	62°F–71°F, 100%–0% cc, 1–4 mph
07/03/2025	1000–1300	CBB Pass 1	KN	67°F–76°F, 50%–0% cc, 7–8 mph
07/17/2025	1000–1300	CBB Pass 2	KN	73°F–77°F, 20%–0% cc, 3–8 mph
07/31/2025	1000–1300	CBB Pass 3	KN	71°F–76°F, 0% cc, 4–8 mph

Notes: BUOW = burrowing owl; CBB = Crotch's bumble bee; KN= Kimberly Narel; °F = degrees Fahrenheit; cc = cloud cover.

Crotch's Bumble Bee Surveys

Dudek conducted additional protocol-level photograph surveys for Crotch's bumble bee, consisting of three passes within suitable habitat on site and a surrounding 100-foot buffer (Table 1). Survey areas were determined by walking the project site to find plants in bloom, specifically areas with suitable floral habitat. Surveys occurred after sunrise and were not conducted during wet conditions (e.g., foggy, raining, or drizzling) or windy conditions (i.e., sustained winds greater than 8 miles per hour). The surveys were conducted during optimal conditions when there were sunny

to partly sunny skies and temperatures greater than 60°F. Focused surveys were conducted according to CDFW's Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species (CDFW 2023), spaced 2 weeks apart during the Crotch's bumble bee colony active period (April–August).

A moderate number of on-site nectar resources were observed during the surveys, but most were past their bloom periods, so methods consisted of finding existing blooming nectar/pollen resources. The Dudek biologist walked wandering transects through these resources with the goal of observing bumble bees in passing and looking for bumble bee nest sites associated with small mammal burrows or other appropriate cavities. Surveys specifically included habitat adjacent to Oso Creek, the existing pollinator garden and nursery, non-native grassland, agricultural land, ornamental vegetation, upland mustards, and coastal sage scrub. When a bumble bee was observed, photos were collected of the bumble bee for identification. Every bumble bee observed during the surveys was identified to species and caste (whenever feasible). Floral species visited by each bumble bee observed were recorded during the foraging bumble bee surveys.

Results

Burrowing Owl Focused Survey Results

Suitable habitat for burrowing owl was detected on the project during the focused burrowing owl surveys. Specifically, two suitably sized burrows (approximately 4 inches in diameter) were detected within ruderal non-native grassland that had been recently mowed in an area immediately outside the project boundary in the northern portion of the project site. Multiple ground squirrels were detected during the focused survey effort and were observed using the burrows for shelter. Riprap within Oso Creek was surveyed, and no evidence of burrowing owl sign or activity was detected. Attachment A, Species Compendium, details the wildlife observed in the survey area (project site plus 500-meter buffer) during the focused surveys.

Suitable habitat for burrowing owl in the survey area consisted of non-native grassland, agricultural land, coastal sage scrub, and disturbed land. Non-native grassland on site was dominated by dense and tall upland mustards and was found to be unsuitable for burrowing owls because it lacked burrows and because burrowing owls prefer open areas with dry habitats and low vegetation. Agricultural lands on the survey area are actively tilled and maintained with a nursery and row crops and so are not suitable for burrowing owl activity.

No burrowing owl or signs of burrowing owl activity (including feathers, whitewash, or pellets) were observed within the survey area. Figure 2, Biological Resources, depicts the potentially suitable burrows detected within the non-native grassland on the project. Attachment B, Photo Log, depicts the potentially suitable burrows observed on site during the focused survey effort. Resumes of the Dudek biologists who conducted the surveys and prepared the memorandum are included in Attachment C.

Crotch's Bumble Bee Focused Survey Results

During the additional focused Crotch's bumble bee surveys conducted by Dudek in 2025, suitable habitat and floral resources were detected on site. No Crotch's bumble bees were observed during the focused survey effort, which consisted of three surveys spaced 2 weeks apart in July, during the colony active period. Multiple bumble bee species were detected foraging in the project site during the focused survey effort. Table 2 includes a summary of the bumble bees observed, their caste, and the plant species they were foraging on.

The bumble bee species observed on site include yellow-faced bumble bee (*Bombus vosnesenskii*) and yellow bumble bee (*Bombus fervidus* spp. *californicus*). Both species of bumble bee were found foraging within the pollinator garden in the southern portion of the project site and within non-native grassland on annual yellow sweetclover (*Melilotus indicus*) in the project site. Attachment A details the plant species identified in bloom within the survey area during the focused Crotch's bumblebee surveys. Approximately 10% of the project site was observed to support floral resources during the focused surveys for Crotch's bumble bee and consisted of a mixture of non-native and native forbs and shrubs. Yellow-faced bumble bee and yellow bumble bee workers were observed foraging on the planted floral resources within the pollinator garden, including lantana (*Lantana* spp.) and Cleveland sage (*Salvia clevelandii*).

The project site supports rodent burrows, bare soil, leaf litter, and rock piles, which can support bumble bee nesting activity. No bumble bee nesting activity was observed during the focused surveys. Attachment B includes photos of the pollinator garden and non-native grassland on site where the bumble bee species were observed, as well as photos of both bumble bee species detected.

Table 2. Focused Bumble Bee Survey Results Summary

Date	Species	Number/Caste	Behavior/Plant Species
07/03/2025	None Observed	N/A	N/A
07/17/2025	yellow bumble bee (<i>Bombus fervidus</i> spp. <i>californicus</i>)	2/Worker	Foraging in pollinator garden on various planted floral resources; foraging on annual yellow sweetclover (<i>Melilotus indicus</i>) in non-native grassland
07/31/2025	Yellow-faced bumble bee (<i>Bombus vosnesenskii</i>)	2/Worker	Foraging in pollinator garden on various planted floral resources

Note: N/A = not applicable.

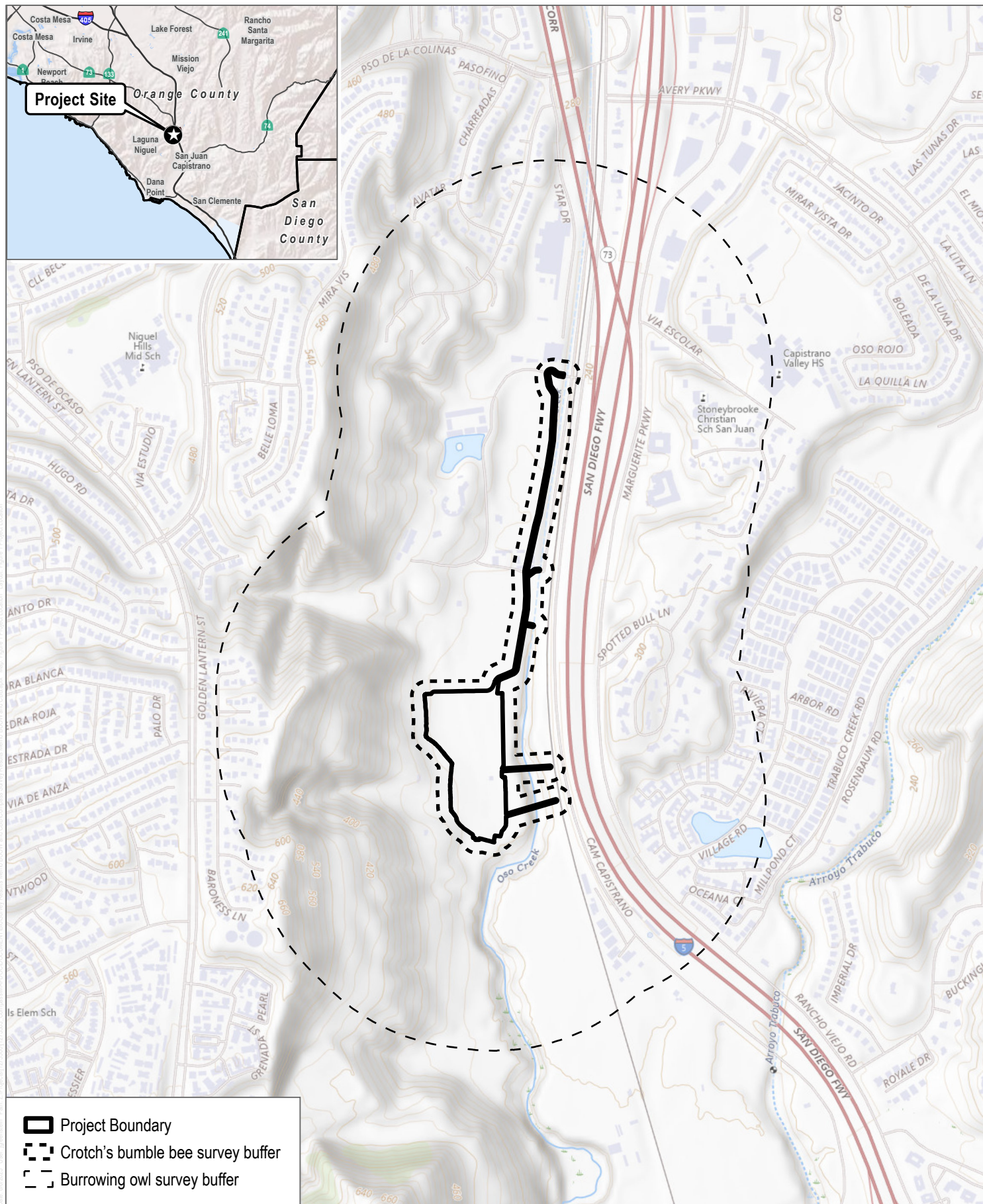
Conclusion

The results of the 2025 focused surveys for burrowing owl and Crotch's bumble bee are negative. No burrowing owl, burrowing owl sign, or burrowing owl activity was observed on the project site and associated 500-meter buffer during the 2025 additional focused breeding season surveys. Although two potentially suitable burrowing owl burrows were detected on site during the surveys, no sign or activity was detected. Ground squirrels occupy the site and were observed using these burrows during the focused surveys.

Additionally, no Crotch's bumble bee were observed on the project site and associated 100-foot buffer during the 2025 focused photograph surveys. Although two bumble bee species were observed foraging in the pollinator garden and non-native grassland on the project site, and suitable nesting habitat is present (rodent burrows, bare soil, rock piles, and leaf litter), no nesting activity was detected during the focused Crotch's bumble bee surveys. Therefore, both species are considered absent from the project site.

References

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SOURCE: USGS National Map 2025

DUDEK



0 500 1,000
Feet

FIGURE 1

Project Location

Compass Energy Storage Project

Attachment A

Species Compendium

Plant Species in Bloom

Angiosperms (Dicots)

APIACEAE—CARROT FAMILY

- * *Conium maculatum*—poison hemlock

APOCYNACEAE—DOGBANE FAMILY

Asclepias eriocarpa—woolypod milkweed

Asclepias fascicularis—narrowleaf milkweed

ASTERACEAE—SUNFLOWER FAMILY

Baccharis salicifolia—mulefat

- * *Calendula officinalis*—pot marigold
- Corethrogyne filaginifolia*—common sandaster
- * *Cosmos bipinnatus*—garden cosmos
- * *Cynara cardunculus*—cardoon
- * *Erigeron bonariensis*—flax-leaved horseweed
- Helminotheca echioides*—bristly oxtongue
- * *Lactuca serriola*—prickly lettuce
- Pseudoghaphalium californicum*—ladies' tobacco
- * *Sonchus asper*—spiny sowthistle

BRASSICACEAE—MUSTARD FAMILY

- * *Brassica nigra*—black mustard
- * *Hirschfeldia incana*—short-pod mustard
- * *Lepidium latifolium*—broadleaved pepperweed

CONVULVULACEAE—MORNING-GLORY FAMILY

- * *Convolvulus arvensis*—field bindweed

FABACEAE—LEGUME FAMILY

- * *Melilotus indicus*—annual yellow sweetclover
- * *Parkinsonia aculeata*—Mexican palo verde, Jerusalem thorn

HELIOTROPIACEAE—HELIOTROPE FAMILY

Heliotropium currasavicum—salt heliotrope

GERANIACEAE—GERANIUM FAMILY

- * *Erodium cicutareum*—redstem stork's bill

LAMIACEAE – MINT FAMILY

- * *Lavandula stoechas* – French lavender
- Salvia clevelandii* – Cleveland sage
- * *Salvia leucantha* – Mexican bush sage

MALVACEAE – MALLOW FAMILY

- * *Malva arborea* – sea mallow

NYCTAGINACEAE – FOUR O’CLOCKS

- * *Bougainvillea spectabilis* – great bougainvillea

ONAGRACEAE – EVENING PRIMROSE FAMILY

- * *Oenothera berlandieri* – Berlandier’s sundrops

PLANTAGINACEAE – PLANTAIN FAMILY

- * *Plantago lanceolata* – ribwort plantain

PLUMBAGINACEAE – LEADWORT FAMILY

- * *Plumbago auriculata* – cape leadwort

POLYGONACEAE – BUCKWHEAT FAMILY

Eriogonum fasciculatum – California buckwheat

SCROPHULARIACEAE – FIGWORTS

- * *Buddleja davidii* – butterfly bush

SOLANACEAE – NIGHTSHADE FAMILY

- Datura wrightii* – jimsonweed
- * *Nicotiana glauca* – tree tobacco
- Solanum douglassii* – Douglas’s nightshade

TAMARICACEAE – TAMARISK FAMILY

- * *Tamarix ramosissima* – salt cedar

VERBENACEAE – VERBANE FAMILY

- * *Lantana camara* – Lantana

VIBURNACEAE – MOSCHATEL FAMILY

Sambucus mexicanus – blue elderberry

Wildlife Species

Vertebrates

Birds

ACCIPITRIDAE—HAWKS

Accipiter cooperii—Cooper's hawk

Buteo jamaicensis—red-tailed hawk

Buteo lineatus—red-shouldered hawk

AEGITHALIDAE—LONG-TAILED TITS

Psaltiriparus minimus - bushtit

ANATIDAE- DUCKS

Anas platyrhynchos - mallard

ARDEIDAE—HERONS

Egretta thula—snowy egret

COLUMBIDAE—PIGEONS AND DOVES

Zenaida macroura—mourning dove

CORVIDAE—JAYS AND CROWS

Aphelocoma californica—California scrub jay

Corvus brachyrhynchos—American crow

Corvus corax—common raven

CHARADRIIDAE—PLOVERS

Charadrius vociferus—killdeer

ESTRILDIDAE—ESTRILDID FINCHES

* *Lonchura punctulata*—scaly-breasted munia

FRINGILLIDAE—FINCHES

Carpodacus mexicanus—house finch

Carduelis psaltria—lesser goldfinch

HIRUNDINIDAE—SWALLOWS

Hirundo rustica—barn swallow

Stelgidopteryx serripennis—northern rough-winged swallow

ICTERIDAE–NEW WORLD ORIOLES

Icterus cucullatus–hooded oriole

Molothrus ater– brown-headed cowbird

MIMIDAE–MIMIDS

Mimus polyglottos–northern mockingbird

PARULIDAE–NEW WORLD WARBLERS

Geothlypis trichas–common yellowthroat

PASSERELLIDAE–NEW WORLD SPARROWS

Melospiza melodia–song sparrow

Melospiza crissalis–California towhee

Pipilo maculatus–spotted towhee

PASSERIDAE–OLD WORLD SPARROWS

Passer domesticus–house sparrow

STURNIDAE–STARLINGS

* *Sturnus vulgaris*–European starling

TROCHILIDAE–HUMMINGBIRDS

Calypte anna–Anna’s hummingbird

Selasphorus sasin–Allen’s hummingbird

TURDIDAE–THRUSHES

Turdus migratorius–American robin

TYRANNIDAE–TYRANT FLYCATCHERS

Sayornis nigricans–black phoebe

Tyrannus vociferans–California towhee

Mammals

CANIDAE–CANIDS

Canis latrans - coyote

DIDELPHIDAE–OPOSSUMS

* *Didelphis virginiana*–Virginia opossum

LEPORIDAE–HAREES AND RABBITS

Sylvilagus audubonii–desert cottontail

SCIURIDAE–SQUIRRELS

Otospermophilus beecheyi–California ground squirrel

Reptiles

IGUANIDAE–IGUANID LIZARDS

Uta stansburiana–common side-blotched lizard

Invertebrates

Insects

Hymenoptera–Sawflies, Wasps, Bees & Ants

APIDAE–BEES

Anthophora californica–California digger bee

Anthophora urbana–urban digger bee

* *Apis mellifera*–European honeybee

Bombus fervidus–yellow bumblebee

Bombus vosnesenskii–yellow-faced bumblebee

Lepidoptera–Butterflies

HESPERIIDAE–SKIPPERS

Hylepheta phyleus–fiery skipper

LYCAENIDAE–GOSSAMER-WINGED BUTTERFLIES

Icaricia acmon–acmon blue

Strymon melinus–grey hairstreak

NYMPHALIDAE–BRUSH-FOOTED BUTTERFLIES

Danaus plexippus–monarch butterfly

Dione vanilla–gulf fritillary

Vanessa cardui–painted lady

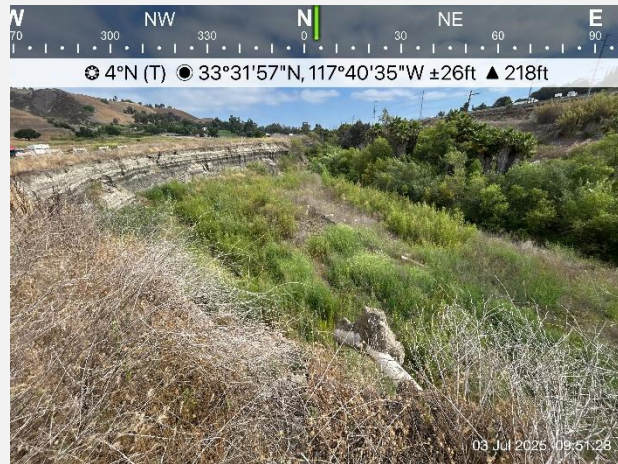
PIERIDAE–WHITES AND YELLOWS

Pieris rapae–cabbage white

* signifies introduced (non-native) species

Attachment B

Photo Log



1. Overview of Oso Creek within the survey area



2. Overview of non-native grassland and agricultural land



3. Burrow approximately 4 inches in diameter within non-native grassland on site



4. Overview of pollinator garden in the center of the project site



5. Worker yellow bumble bee (*Bombus fervidus*) foraging in pollinator garden on site



6. Worker yellow-faced bumble bee (*Bombus vosnesenskii*) foraging in pollinator garden on site

Attachment C

Resumes

Tommy Molioo

SENIOR BIOLOGIST

Tommy Molioo is a senior biologist with 16 years' professional experience as a biologist and project manager specializing in technical surveys and reporting for projects requiring California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) compliance. Mr. Molioo's experience includes conducting habitat assessments, biological resources impact analyses, bat surveys, year-long biodiversity studies, avian and raptor surveys, habitat mitigation monitoring, and local and regional habitat conservation plan compliance and strategic planning.

Mr. Molioo has prepared biological technical reports for projects requiring compliance with local and regional habitat conservation plans, natural community conservation plans, and local coastal programs throughout Southern California. He has also prepared biological resources analyses sections for project and programmatic-level environmental impact reports (EIRs)/EISs, as well as initial studies (ISs), environmental assessments, and biological assessments, to support U.S. Fish and Wildlife Service (USFWS) Section 7 permitting. Mr. Molioo has also conducted focused protocol surveys for a variety of sensitive plant and wildlife species including, but not limited to, coastal California gnatcatcher, burrowing owl, desert tortoise, and Coachella Valley milkvetch.

Mr. Molioo specializes in conducting non-invasive acoustic monitoring surveys for bats for species identification, roost assessments, and preparing and implementing exclusion plans. He is well versed in full-spectrum bat-call data analysis and preparing bat exclusion plans for CDFW approval. He also conducts formal wetland delineations for state and federally regulated waters and wetlands, and preparing regulatory permitting applications for local, state, and federal agencies. Mr. Molioo has also prepared and implemented mitigation monitoring plans for restoration projects.



Education

*University of Denver
MAS, Environmental
Policy and Management,
2017*

*Minot State University
BA, Biology, 2008*

Certifications

*CDFW, Scientific
Collecting Permit,
No. SC-10395*

Professional Affiliations

*North American Society of
Bat Research*

*Western Bat
Working Group*

*Western Section of the
Wildlife Society*

Project Experience

Development

The Creek at Dominguez Hills, Shopoff Group, Carson, California. Served as phase manager/project biologist. The project proposes to redevelop the southern portion of the exiting Victoria Links Golf Course into a multi-use sports complex. Conducted a biological reconnaissance of the project site, as well as a late season botanical survey, jurisdictional delineation, and focused California gnatcatcher surveys. Prepared a biological technical report to document the existing conditions and analyze impacts. Also prepared the Biological Resources section for the project's EIR, which prescribed mitigation to reduce potential impacts to a less than significant level. Project is currently in progress.

Carol Kimmelman Sports and Academic Campus, County of Los Angeles, Carson, California. Served as phase manager/project biologist. The project proposes to redevelop the northern portion of the Victoria Links Golf Course with new recreation uses including a new sports and academic campus. Conducted a biological reconnaissance of the project site, as well as a jurisdictional delineation, and focused California gnatcatcher surveys. Prepared the Biological Resources section for the project's EIR, which prescribed mitigation to reduce potential impacts to a less than significant level. Project is currently in progress.

Bakersfield Synagro South Kern Compost Manufacturing Facility Project, Tilden-Coil Constructors, Bakersfield, California. Served as project manager. Oversaw the biological reconnaissance and preparation of the biological technical report for a 50-acre composting facility project in southwestern Bakersfield. Also conducted preconstruction burrowing owl surveys for the project. Reviewed and provided edits for both reports and coordinated with the client regarding project updates and billing.

Murrieta Greenberg Apartment Technical Studies and Mitigated Negative Declaration, Murrieta Whitewood Multifamily, Murrieta, California. Served as biological technical lead. Conducted the biological reconnaissance of the 10-acre site proposed for the construction of a 162-unit apartment project. Oversaw the preparation of the biological technical report and biological resources section of the project's mitigated negative declaration (MND). Provided review and comment edits to both documents.

San Bernardino Patriot Valley View and Santa Fe Warehouse Studies, Patriot Development Partners, San Bernardino, California. Served as biological technical lead. Conducted the biological reconnaissance and prepared the biological technical report for the 121,900-square-foot warehouses project that involves demolishing and constructing two new warehouses. Also prepared the biological resources section of the project's IS/MND.

11776 Sheep Creek Road, Phelan, California. Served as project manager/biologist. Conducted a biological reconnaissance of the 2-acre property to document existing conditions on the study area. Prepared a biological technical letter report describing the biological resources and providing mitigation to reduce any potential project-related impacts to a less than significant level.

Energy and Water

San Joaquin Field Division Habitat Conservation Plan, California Department of Water Resources, Central Valley, California. Served as lead bat biologist. Developed the survey plan for bat surveys along approximately 100 linear miles of the California Aqueduct, from Kettleman City south to Tejon Ranch. Conducted a daytime roost assessment of the entire 100-mile alignment to determine potentially suitable roost locations and deployed passive acoustic bat detectors along the aqueduct at suitable roosting locations and flyways. Eight detectors were deployed for a week at each location to detect the echolocation calls of bats flying through the area. After each week's deployment, the detectors were moved south to eight new locations for another week's deployment. The detector deployment took place over a 28-week period to survey the entire alignment of the project. At the end of the bat acoustic surveys, all recorded echolocation calls were analyzed using SonoBat 4 software with automated classification. The results were included in the biological report for the project.

Delta Field Division Habitat Conservation Plan, California Department of Water Resources, Central Valley, California. Served as lead bat biologist. Developed the survey plan for bat surveys along approximately 100 linear miles of the California Aqueduct, from the San Luis Rey Reservoir north to the Bethany Reservoir. Conducted a daytime roost assessment of the entire 100-mile alignment to determine potentially suitable roost locations and deployed passive acoustic bat detectors along the aqueduct at suitable roosting locations and flyways. Eight detectors were deployed for a week at each location to detect the echolocation calls of bats flying through the area. After each week's deployment, the detectors were moved south to eight new locations for another week's

deployment. The detector deployment took place over a 28-week period to survey the entire alignment of the project. At the end of the bat acoustic surveys, all recorded echolocation calls were analyzed using SonoBat 4 software with automated classification. The results were included in the biological report for the project.

Facilities Master Plan EIR, Orange County Sanitation District, California. Served as project biologist. Prepared the biological resources chapter of the project's hybrid project/program EIR for the District's proposed Facilities Master Plan. The approximately 83 capital improvement projects addressed in the project/program EIR would be located at various sites throughout the District's service area, which covers an approximately 479-square-mile area within the northwestern and central portions of Orange County. Developed project-level and program-level mitigation to address project impacts to biological resources for the duration of the Facilities Master Plan implementation for the next 20 years.

Sandpiper Battery Energy Storage System Project, Confidential Client, San Clemente, California. Served as the lead biologist for the proposed project. Conducted due diligence and consulted with the client directly on project design on the initial project site. Due to potential impacts and a change in the lead agency, the project was moved to a secondary location. Conducted the biological reconnaissance, prepared a biological technical report, and conducted focused surveys for coastal California gnatcatcher. Also prepared the biological resources proposal and managed the billing for the biological phases.

Compass Battery Energy Storage System Project, Confidential Client, Mission Viejo, California. Served as the lead biologist for the proposed project. Conducted the biological reconnaissance, prepared a biological technical report, conducted focused surveys for coastal California gnatcatcher and least Bell's vireo, and oversaw rare-plant surveys. Also reviewed the preparation of the jurisdictional delineation survey and aquatic resources delineation report. Due to changes in funding, the final document delivered was an application from the California Energy Commission. Prepared the biological resources section of the application.

Newport Bay Crossings Project, City of Newport Beach, California. Served as the field biologist and author for the terrestrial portion of the pipeline replacement project crossing below Newport Bay. Conducted the biological reconnaissance for all six pipeline replacement locations and prepared two biological technical reports for the terrestrial portion of the project. The aquatic environment was addressed in a separate report. Also conducted a focused rare-plant survey for target species.

Cristianitos Road Improvement Project, Santa Margarita Water District, Orange County, California. Served as the project manager and lead biologist on a project to repair the South Coast Pipeline located beneath Cristianitos Road in unincorporated Orange County. Dudek assisted with conducting and preparing biological and aquatic resources surveys and reports and prepared the regulatory permit applications for state and federal permitting. Due to the project's location within a Special Area Management Plan, a Letter of Permission was obtained from the U.S. Army Corps of Engineers.

De Soto Tanks Project, LA Department of Water and Power (LADWP), Chatsworth, California. Served as phase manager/project biologist. The project proposes to replace the existing 3-million-gallon (MG) De Soto Reservoir located at 11200 De Soto Avenue (APN: 2706-007-901), with two buried, pre-stressed circular concrete storage tanks immediately north of the existing reservoir site (APN: 2701-003-907). Conducted a late season botanical survey and summarized the results of the biological reconnaissance, and California gnatcatcher surveys into a biological technical letter report. Also prepared the Biological Resources section for the project's EIR. Project is currently in progress.

Transportation

Old Road Bridge Over Castaic Creek, County of Los Angeles, California. Served as lead biologist. Conducted the biological reconnaissance for the 27-acre project site for the replacement of the existing Old Road Bridge that crosses over Castaic Creek. Prepared a Natural Environment Study for California Department of Transportation (Caltrans) approval that documented the biological resources and impacts to federally listed species for NEPA compliance. Also scheduled and participated in focused species surveys conducted on the site, including least Bell's vireo, arroyo toad, rare plants, and bats. Also prepared the biological resources section of the project's MND.

Bridge Preventative Maintenance Program Group 21, County of Los Angeles, California. Served as lead biologist. Conducted the biological reconnaissance for 17 bridges in the southeast Los Angeles County area and prepared a Natural Environment Study for Minimal Impact for Caltrans's approval to analyze project effects to NEPA. Also prepared the biological resources section of the MND.

Focused Species Surveys

Environmental Services for Beaumont-Cherry Valley Recycled Water Pipeline Extension Project, Yucaipa Valley Water District, Riverside, California. Served as field biologist. Conducted focused coastal California gnatcatcher surveys according to USFWS protocol for the federally threatened species.

Reservoir 2B Replacement Project, South Coast Water District, Orange, California. Served as field biologist. Conducted focused coastal California gnatcatcher surveys according to USFWS protocol for the federally threatened species.

Bedford Canyon Channel Preliminary Environmental Assessment Technical Reports, Riverside County Flood Control and Water Conservation District, Corona, California. Served as bat biologist. Conducted a focused bat survey for the 10-acre project site. Survey methods included a daytime roost assessment, a nighttime emergence survey, and passive acoustic monitoring. Recorded echolocation calls were analyzed off site using SonoBat software with automated classification and manual vetting of ambiguous calls.

Resource Management

Fairview Regional Park, City of Costa Mesa, California. Served as project biologist. Dudek conducted an evaluation of the water quality of ponds and channels that were previously installed at the northern portion of the 195-acre Fairview Regional Park. Assisted in an assessment of the existing biological resources on the site and prepared an analysis of how the proposed project improvements could result in impacts to biological resources. The biological analysis was conducted in conjunction with Dudek's Restoration and Engineering teams to provide the client with one comprehensive document.

Talbert Regional Park, City of Costa Mesa, California. Served as project biologist. Led a team of biologists in conducting and preparing a biological resources technical report, a jurisdictional delineation, and various focused special-status species surveys. Focused surveys included the following species: coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, burrowing owl, fairy shrimp, nesting birds, and rare plants. The results of the surveys were used by the County of Orange to prepare a master plan for the restoration of the approximately 180-acre park, which was divided into two portions referred to as "North Talbert" and "South Talbert." Developed avoidance measures for discovered sensitive biological resources.

Relevant Previous Experience

Bats and Other Sensitive Species Surveys

Seismic Bridge Retrofit Project, Department of Water Resources, Central Valley, California. Served as project manager and bat biologist. Conducted bat emergent surveys, pre-construction surveys, and acoustic monitoring surveys for five bridges spanning the California Aqueduct within several cities and counties throughout California's Central Valley. The results of the surveys were included in a Bat Mitigation Plan for the project. Programmatic avoidance/mitigation measures were provided in the event bats were discovered on any of the bridges included in the project. The Mitigation Plan was approved by the California Department of Fish and Wildlife (CDFW) in the event of any potential impacts to state-listed species.

Los Robles Road Bridge Retrofit Project, Department of Water Resources, Central Valley, California. Served as project manager and bat biologist. Conducted a roost assessment, bat emergent surveys, and acoustic monitoring surveys for the Los Robles Road Bridge that spans the portion of the California Aqueduct located to the east of Quail Lake in the Gorman area of Los Angeles County. The results of the survey were analyzed using Sonobat 4 software and included in a letter report of findings, including any minimization measures to reduce potential project-related impacts.

Leo Carrillo Ranch Historic Stables Renovation Project, City of Carlsbad, San Diego County, California. Served as project manager and bat biologist. Consulted with the City of Carlsbad Parks and Recreation Department regarding the potential impacts to a known bat roost within the historic stables on the Leo Carrillo Ranch Park. Conducted a presence/absence survey of the stables to determine if bats are roosting on site and identify the species present. Prepared a letter report of findings as well as a Bat Exclusion Plan due to the presence of a colony of Mexican free-tailed bats. Advised the City on purchasing and installing 2 bat boxes adjacent to the stables, and the methodology to protect bats during the proposed project. Prepared and implemented a Bat Exclusion Plan which consisted of excluding bats with one-way doors and verifying bats have left the stables at the end of the exclusion period.

Topock Soil Remediation Project, Pacific Gas and Electric (PG&E), Topock, California. Served as bat biologist. Conducted multiple bat habitat assessment surveys and focused bat surveys for the soil remediation and groundwater remedy project site associated with the PG&E Compressor Station in Topock California. The various surveys were conducted in 2015 with bat experts Dr. Pat Brown, Bill Rainey, and Dave Johnston within all suitable habitat areas on the project site. Assisted in developing mitigation and avoidance measures to reduce potential impacts to bats, including Townsend's big-eared bat.

668 Alameda, City of Los Angeles, California. Served as bat biologist. Conducted a presence/absence survey of an existing cold storage building in the Arts District of Downtown Los Angeles. Determined the presence of a colony of approximately 60 Mexican free-tailed bats roosting on the building. Determination was made by conducting an emergence survey, and both active and passive acoustic monitoring.

SR 57 NB Bat Surveys, Anaheim, Orange County, California. Served as project manager and bat biologist. Conducted pre-construction presence/absence surveys of an approximately 1-mile section of the 57 Freeway in the City of Anaheim, where the Freeway crosses over the Santa Ana River near Angels Stadium. Conducted three nights of exclusion surveys with simultaneous active acoustic monitoring to visually and acoustically determine bat presence/absence.

Meredith International Centre Bat Roosting Habitat Suitability Assessment, Ontario, San Bernardino County, California. Served as project manager and bat biologist. Conducted an assessment of the project to support roosting and foraging bats. The assessment was conducted during daytime hours and searched for any bat activity or presence of sign (i.e., guano, staining, etc.) within the two concrete-lined creeks that pass through the project site.

Ballona Wetlands Restoration Project, City of Marina Del Rey, Los Angeles County, California. Served as bat biologist. Conducted fall season bat acoustic monitoring surveys at three locations within the Ballona Wetlands to determine if any bat species are currently utilizing the project site. The surveys were conducted to obtain general bat species information of the site.

Big Canyon Habitat Restoration and Water Quality Improvement Project, Newport Beach, Orange County, California. Served as bat biologist. Conducted pre-construction presence/absence surveys for Phase I of the project. Surveys consisted of a roost assessment, emergence survey at dusk, and passive acoustic monitoring at a culvert and riparian woodland area. Prepared letter report of findings with recommended avoidance measures.

Saddle Crest Project, Orange County, California. Served as bat biologist. Conducted a pre-construction presence/absence surveys within the 62-acre development footprint for the approximately 114-acre project site. Surveys consisted of a roost assessment, emergence survey at dusk, and passive acoustic monitoring at two locations. Prepared a letter report of findings with recommended avoidance measures.

Ice Blocks Project, Sacramento, Sacramento County, California. Served as bat biologist. Designed the survey effort for bat acoustic monitoring surveys for two abandoned warehouses that were scheduled for demolition. Coordinated with Northern California bat biology team on the methodology to be implemented during the week-long survey effort for conducting visual emergence surveys and non-invasive passive monitoring. Also analyzed collected data and identified potential sensitive species recorded.

Canyon Heights Residential Development, City of Canyon Lake, Riverside County, California. Served as field biologist. Conducted focused surveys for coastal California gnatcatcher over two survey seasons, as well as avian surveys for all bird species occurring within the restoration site.

LADWP Pine Canyon Wind Farm, Tehachapi Area, Kern County, California. Served as bat biologist. Conducted bat inventory surveys during the summer and fall seasons at LADWP's Pine Canyon wind farm facility. The survey was conducted using acoustic monitoring detectors set up for a month at a time with the use of solar panels. Collected data was analyzed off site with the use of Sonobat software and results were included in the Bird and Bat Monitoring Plan for the project with recommendations to reduce potential impacts to bats from the existing wind farm facility.

Barstow Walmart Distribution Center, California. Served as field biologist. Conducted focused protocol surveys for burrowing owl on a 143-acre project site. The surveys were conducted in accordance with the accepted protocol outlined in the Burrowing Owl Consortium guidelines. All suitable habitat and a 500-foot buffer were surveyed for the presence/absence of burrowing, and/or sign of burrowing owl. No burrowing owl was observed on site or within the survey area.

Pick-A-Part Recycling Center, Unincorporated Riverside County, California. Served as field biologist. Conducted a focused protocol burrowing owl survey for 150 acres in unincorporated Riverside County as part of a multiple species habitat conservation plan (MSHCP) consistency analysis. The survey was conducted in accordance with the Burrowing Owl Consortium, CDFW, and MSHCP focused survey guidelines for burrowing owl. The burrowing owl surveys were conducted concurrently with a general habitat assessment, jurisdictional delineation, focused plant survey, and Los Angeles pocket mouse trapping. The results of the focused burrowing owl survey was prepared into a written report and included as an appendix to the MSHCP consistency analysis report.

Cogentrix Quail Brush Generation Project, San Diego County, California. Served as field biologist. Assisted permitted biologist Scott Crawford with conducting focused protocol surveys for the federally threatened coastal California gnatcatcher. One individual was observed within coastal sage scrub habitat on 4 different survey occasions. The focused gnatcatcher surveys were recommended as part of the biological resources assessment due to suitable habitat on site.

Burrowing Owl Focused Surveys, Southern California. Conducted and assisted in conducting dozens of focused surveys, following CDFW and MSHCP protocol for burrowing owls, during numerous projects in Los Angeles, San Bernardino, and Riverside Counties. Surveys involved data collection on burrowing owl numbers, behavior, locations, occupied burrows, and sign. Reports were prepared to document findings.

Sensitive Species Surveys, Southern California. Assisted and independently conducted habitat assessments, monitoring surveys, and focused protocol surveys for Coachella Valley milk-vetch, Arroyo toad, desert tortoise, Los Angeles pocket mouse, San Bernardino kangaroo rat, least Bell's vireo, coastal California gnatcatcher and burrowing owl, for projects in Los Angeles, Orange, Riverside, and San Bernardino Counties. The surveys involve overall species accounts, including monitoring behavior and nest locations, and also consisted of an inventory of all plant and wildlife species observed on the sites, vegetation mapping, and habitat assessment.

Development

Fresno General Plan Update, City of Fresno, California. Served as project biologist. Prepared the Biological Resources Section, which included documenting existing biological conditions for the City of Fresno and preparing a programmatic-level impact analysis, for the City of Fresno 2035 General Plan Master EIR. The biological resources within the entire City of Fresno zone of influence were documented and analyzed for potential impacts related to future projects within the City.

Downtown Fresno Specific Plan, City of Fresno, California. Served as project biologist. Prepared the Biological Resources Section for the City of Fresno Downtown Specific Plan Project. The Project involved the revitalization of the Downtown Fresno Area including upgrading buildings and roads, and planning for new development. The report included an analysis of potentially sensitive biological resources that may be impacted and preparation of mitigation.

Walker Basin, De Luz and Sandia Vineyards, Riverside County, California. Served as project biologist. Tommy assisted with general reconnaissance surveys, vegetation mapping, and oak tree mapping on approximately 140 acres in Western Riverside County. Tommy also conducted a jurisdictional delineation on a portion of the project site, as well as mapped potential restoration areas in support of preparation of a Determination of Biological Equivalent or Superior Preservation report. The work was conducted in compliance with the Western Riverside County MSHCP, with direct consultation between the Applicant, the Riverside County Environmental Program Division, CDFW, and USFWS. The biological county documents were prepared in order to support a Criteria Area Refinement by the MSHCP.

Bonsall Unified School District, Bonsall, San Diego County, California. Served as project biologist. Prepared the Biological Resources Section for the project's EIR to address the potential biological impacts from constructing a new high school on 48.9 acres of designated public agency land.

5801 Foxview – Biological Resources Assessment, City of Malibu, Los Angeles County, California. Served as project biologist. Conducted a habitat assessment on the approximately 1-acre project site to determine if the proposed single-family residence project would result in any impacts to biological resources protected by the City of Malibu Local Coastal Plan. Resources evaluated included the presence of any Environmentally Sensitive Habitat Areas. Prepared a Biological Resources Report of the findings.

Betz Mulholland Hwy – Biological Resources Assessment, Los Angeles County, California. Served as project biologist. Conducted a habitat assessment on the approximately 1-acre project site to determine if the proposed single-family residence project would result in any impacts to biological resources protected by the County of Los Angeles. Resources evaluated included the presence of any Significant Ecological Areas and identifying H1, H2, and H3 habitats. Prepared a Biological Resources Report of the findings.

Olive Ciernia Project, City of San Jacinto, Soboba Indian Reservation, California. Served as field biologist. Conducted a reconnaissance-level survey to determine the existing conditions on an approximately 100-acre project site. The project involves the acquisition of private parcels by the Soboba Band of Luiseno Indians as part of the fee-to-trust project carried out by the BIA. A biological assessment was prepared for the project to determine potential impacts to any federally listed species.

Pixley Biogas Anaerobic Digester Project, Pixley, Tulare County, California. Served as field biologist. Conducted a biological resources assessment on the approximately 2.75-acre project site. Plant and wildlife species, and associated habitats, were documented during a one day reconnaissance-level survey. The results of the survey were included in a Biological Resources Assessment report including impact analysis and mitigation measures.

Cabazon Outlet Mall Expansion Project IS/MND, Riverside County, California. Served as field biologist. Prepared the biological resources section for an IS/MND for the proposed Cabazon Outlets II Project in the community of Cabazon, Riverside County, California. The project was analyzed for consistency with the Coachella Valley MSHCP.

San Clemente Target, City of San Clemente, California. Served as field biologist. Conducted a reconnaissance-level field survey to assess the existing conditions on site and identify sensitive biological resources within the 15-acre project site. The survey focused on assessing suitable habitat for sensitive plant species including thread-leaved brodiaea and sensitive wildlife species including burrowing owl and coastal California gnatcatcher. The findings of the survey were prepared into a biological resources assessment report, which included correspondence with City personnel to address impacts and mitigation.

Foxglove Shopping Center, City of Madera, California. Served as field biologist. Conducted a reconnaissance-level field survey to assess the existing conditions on site and identify sensitive biological resources within the 19.51-acre project site. The survey included documenting all plant and wildlife species, assessing the presence of potentially jurisdictional waters, and determining the project's potential to impact sensitive biological resources. The results of the survey were included in a letter report of findings including recommendations for avoiding potentially significant impacts to biological resources.

Trabuco Canyon Oak Woodland Assessment. Orange County, California. Served as project manager and field biologist. Conducted an assessment of the oak woodland habitat on a half-acre parcel proposed for a single family residence in the Trabuco Canyon area of Orange County. The assessment included an investigation of previously removed vegetation to determine species and survey of existing vegetation on the property. A letter report of findings was prepared to refute a County Courtesy Notice.

6185 Kimball Avenue Project, San Bernardino County, California. Served as field biologist. Conducted a biological resources survey and habitat assessment for a 16.3-acre project site located in the City of Chino. The project site is proposed for development into a 300,000 square foot warehouse/industrial building. The entire project site and a 500-foot buffer were surveyed to document existing conditions and determine if suitable habitat occurs for sensitive species. Focused surveys for burrowing owl were recommended and surveys were conducted subsequent to the habitat assessment. No burrowing owls were observed during the protocol surveys.

Lamont Walmart, City of Lamont, California. Served as project biologist. Conducted a general biological survey and habitat assessment on a 21.5-acre property proposed for development into a Walmart retail store with associated parking and three fast-food restaurants. The survey involved documenting the habitat and biological resources on site, and an evaluation of potential sensitive biological resources that could occur on the project site. The results of the survey were included in a Biological Resources Assessment Report for the client to obtain necessary building permits.

Los Baños Walmart, City of Los Baños, California. Served as project biologist. Conducted a general biological survey and habitat assessment on a 21.5-acre property proposed for development into a Walmart retail store with associated parking and three fast-food restaurants. The survey involved documenting the habitat and biological resources on site, and an evaluation of potential sensitive biological resources that could occur on the project site. The results of the survey were included in a Biological Resources Assessment Report for the client to obtain necessary building permits.

Olive 99 Walmart Store No. 3091-00, City of Bakersfield, California. Served as project biologist. Conducted a general biological survey and habitat assessment on an approximately 21.54-acre property proposed for development into a 128,143-square-foot Walmart retail store with associated parking and a retention basin. The survey involved documenting the habitat and biological resources on site, and an evaluation of potential sensitive biological resources that could occur on the project site. The results of the survey were included in a Biological Resources Assessment Report for the client to obtain necessary building permits.

Bakersfield Oswell Walmart, City of Bakersfield, California. Served as project biologist. Conducted a pre-construction clearance survey of the project site to determine the presence/absence of special-status species, including but not limited to San Joaquin kit fox, burrowing owl and nesting birds. The results of the survey were included in a letter report of findings.

Walmart Market, City of Oildale, California. Served as project biologist. Conducted pre-construction clearance survey of the proposed 41,000-square-foot Walmart Market project site to determine the presence/absence of special-status species, including San Joaquin kit fox, burrowing owl and nesting birds. An initial and follow-up survey were conducted at the site. The results of the survey were included in a letter report of findings.

Kerman Walmart, City of Kerman, California. Served as project biologist. Conducted a pre-construction clearance survey of the 20-acre project site to determine the presence/absence of special-status species, including but not limited to San Joaquin kit fox, burrowing owl and nesting birds. An initial and follow-up survey were conducted at the site. The results of the survey were included in a letter report of findings.

Kings Canyon Walmart, City of Fresno, California. Served as field biologist. Conducted a pre-construction clearance survey of the proposed 0.95-acre project site to determine the presence/absence of special-status species, including but not limited to burrowing owl, loggerhead shrike and nesting raptors. An initial and follow-up survey were conducted at the site. The results of the survey were included in a letter report of findings.

Tentative Tract 33642, City of Moreno Valley, California. Served as field biologist. Conducted a Riverside MSHCP Consistency Analysis for a 17-acre residential development property in Moreno Valley, CA. Assessed the site for burrowing owl, and riverine/riparian areas as described by the MSHCP, and prepared a written Habitat Assessment and MSHCP Consistency report, and Burrowing Owl Focused Survey report.

Remediation

Topock Compressor Station Soil Investigation EIR, Department of Toxic Substances Control (DTSC) and PG&E, Topock, Arizona and Needles, California. Served as author/bat biologist. DTSC provides oversight of the site investigation and cleanup activities for the PG&E Topock Compressor Station located in San Bernardino County, 15 miles southeast of Needles, California, and one half mile west of the Colorado River. Soil samples were to be taken from the soils under and near the PG&E Topock Compressor Station to determine the presence of hexavalent chromium, a known carcinogen, and other chemicals of concern. Assisted in preparation of the Biological Resources Section for the Soils Investigation EIR for the proposed soil remediation activities at the Topock Compressor Station. Also assisted in conducting two bat surveys on the project site, which focused on identification of species and potential roosts using a variety of methods including mist-netting, acoustic monitoring, radio-telemetry, and emergence surveys with night-vision binoculars. Served as general biological oversight for the California DTSC.

Topock Compressor Station Final Groundwater Remedy Project, Subsequent EIR, DTSC and PG&E, Topock, Arizona and Needles, California. Served as author/bat biologist. DTSC provides oversight of the site investigation and cleanup activities for the PG&E Topock Compressor Station. Groundwater samples taken from the groundwater under and near the PG&E Topock Compressor Station were found to be contaminated with hexavalent chromium, a known carcinogen, and other chemicals of concern. In addition, soil contamination is present at the site, requiring investigation and cleanup. Prepared the biological resources section for the Subsequent EIR for the final groundwater remedy project.

Energy and Water

Pine Canyon Wind Farm Development in the Tehachapi Mountains, Los Angeles Department of Water and Power (LADWP) Pine, Kern County, California. Served as biologist. Conducted a yearlong avian study to document all avian species, specifically raptors, which occur within a 7-mile area of the Tehachapi Mountains for a proposed wind farm. The surveys were conducted on foot from eight different vantage points throughout the canyon with the use of a helicopter for transportation between each vantage point. The studies utilized binoculars, spotting scopes, and audible detection to determine the different species in the area. Bat sonar recording, protocol raptor surveys and vegetation mapping were also conducted along with the general avian surveys. The study will be used to determine if the construction of a new wind farm in the Tehachapi Mountain range will adversely affect resident, migratory and sensitive avian species.

Eastern Recycled Water System, City of Escondido, California. Served as project biologist and author. Coordinated the field reconnaissance survey for the project site and prepared the biological resources section of the MND. Conducted field surveys for general biological resources and focused surveys for rare plants and coastal California gnatcatcher. Also conducted and prepared a jurisdictional delineation and assisted the project manager with addressing public comments.

Dry Lake Solar Project, Playa Solar, Clark County, Nevada. Served as field biologist. Prepared a Biological Assessment and the Biological Resources Section of an Environmental Assessment for a 1,700-acre solar power generating facility in southern Nevada. The Biological Assessment was prepared to address potential project impacts to federally listed species, including desert tortoise, Moapa dace, and federally listed birds. The environmental assessment was prepared to address environmental impacts under NEPA. The analysis tiered to the programmatic environmental impact statement for the Bureau of Land Management's Solar Energy Zones.

Soboba Solar Project, Riverside County, California. Served as field biologist. Prepared a biological assessment and the biological resources section of an environmental assessment for a 1-megawatt solar power generating facility on the Soboba Indian Reservation in Riverside County. The biological assessment was prepared to address potential impacts to sensitive biological resources, evaluated at a NEPA level to comply with a federal action.

Artesian Substation Project, California Public Utilities Commission, San Diego County, California. Served as field biologist. Conducted a field survey to ground-truth the results of previously prepared biological resources reports for a proposed new substation and power line route. Met on site with San Diego Gas and Electric biologist to discuss the findings of biological surveys and determine any potential project constraints. Prepared the Biological Resources section of the project's MND for submittal to the California Public Utilities Commission.

Gaskell West Solar Project, Recurrent Energy, Kern County, California. Served as biologist. The project will develop a 125-megawatt photovoltaic solar facility on approximately 1,400 acres of privately owned land. Prepared the Biological Resources section for the project's EIR according to an established Kern County format. Developed mitigation measures to reduce potential impacts to desert tortoise and Joshua tree habitat.

San Juan Watershed Project, EIR, Santa Margarita Water District, Orange County, California. Served as field biologist. The Santa Margarita Water District, in conjunction with South Coast Water District, is proposing to implement the San Juan Watershed Project that would develop facilities to manage surface water resources to enhance groundwater resources of the San Juan Basin. The Project would increase the capture and storage of urban runoff and stormwater, optimize the use of recycled water for beneficial reuse, minimize the potential for undesirable impacts, and augment local water supplies to reduce the region's dependence on imported water. Tommy conducted the site reconnaissance for biological resources and prepared the Biological Resources Technical Report for the project.

Microfiltration/Reverse Osmosis Facility, City of Escondido, San Diego County, California. Served as biologist. Coordinated the field reconnaissance survey for the project site and reviewed the prepared biological letter report. Prepared the biological resources section for the IS/MND and assisted the Project Manager with addressing public comments.

San Jacinto Valley Enhanced Recharge and Recovery Program, Eastern Municipal Water District, City of San Jacinto, Riverside County, California. Served as project biologist. Conducted a habitat assessment survey of the project site which included 3 recharge basins and 44,000 linear feet of proposed pipelines within the City of San Jacinto and Hemet. Prepared a BTR of the proposed program and the Biological Resources Section of the EIR which analyzed both program-level and project-level impacts.

Sterling Natural Resource Center, City of Highland, San Bernardino County, California. Served as project biologist. Assisted the San Bernardino Valley Municipal Water District in preparing the Biological Resources section for the project's EIR. The proposed SNRC would provide tertiary treatment to wastewater generated within East Valley Water District's service area, modify East Valley Water District's wastewater collection facilities, and construct treated water conveyance systems to beneficially use treated water in the upper Santa Ana River watershed.

Lift Station No. 2 Project, South Coast Water District, City of Laguna Beach, Orange County, California. Served as project biologist. Conducted a habitat assessment survey and prepared the Biological Resources section for the Initial Study for the Phase 1 portion of the project. The South Coast Water District currently operates Lift Station 2 which is a reinforced concrete wet well and dry well sewage lift station. The lift station is located at 31104 Country Club Drive and conveys raw sewage to the South Orange County Wastewater Authority Coastal Treatment Plant via a 20-inch diameter ductile iron force main that is over a mile in length to the east and runs generally parallel to Aliso Creek.

On-Call Environmental Services, Los Angeles County Department of Public Works, Los Angeles County, California. Served as field biologist. Supporting the Los Angeles County Department of Public Works, including the Flood Maintenance Division (Los Angeles County Flood Control District) by providing a full array of environmental services under an on-call services contract. Providing a wide range of planning, permitting, and compliance needs for routine and emergency operations and maintenance projects, and services have included preparation of regulatory permits (404, 401, and 1602), biological and cultural resources surveys and reports, focused surveys for federally –listed species, wetland delineations, mitigation monitoring and reporting, air and water quality sampling, and preparation of CEQA documents. A few notable projects include the Big Dalton Dam, Big Tujunga Dam, Cattle Canyon, and Los Angeles Greenway Project, which all required preparation of permit applications and/or technical studies to support permitting and CEQA.

Annexation Project Orange County Water District, California. Served as biologist. Prepared biological resources section, which includes documenting existing conditions and impact analysis, for Orange County Water District's Annexation Project as part of a project-level and programmatic-level EIR. The project proposed to allow additional municipalities to pump additional water from Orange County Water District wells. A portion of the project involved constructing new pump stations and other portions involved no additional construction. The proposed project was evaluated for potential impacts to biological resources within the Orange County basin. Mitigation measures were prescribed in the impact analysis to minimize impacts to potential sensitive biological resources.

Henrietta Solar Project, SunPower, Kings County, California. Served as biologist. Prepared the Biological Resources Section for an IS/MND, which includes documenting existing conditions and impact analysis, for the 836-acre SunPower Henrietta Solar Project. The project proposed to construct and operate a 136-megawatt alternating current photovoltaic electricity generating facility and associated infrastructure. Mitigation measures were prescribed in the impact analysis to minimize impacts to potential sensitive biological resources.

Jurisdictional Delineations and Regulatory Permitting

Noyes Street Vector Habitat Remediation Project, City of San Diego, California. Served as field biologist. Conducted a jurisdictional delineation survey of the Kendall Frost Marsh Reserve and areas that would be affected by the project. The survey involved identifying potential waters of the U.S., State, and local jurisdiction to identify potential impacts to jurisdictional waters by the project.

Big Dalton Dam Sluiceway Rehabilitation Project, City of Glendora, Los Angeles County, California. Served as field biologist. Conducted a jurisdictional delineation, and prepared a report, for the LA Department of Public Works for their Sluiceway Rehabilitation Project on the Big Dalton Dam. The survey involved identifying potential waters of the U.S. and State to identify potential impacts to jurisdictional waters by the project.

Cattle Canyon Project, Glendora, Los Angeles County, California. Served as field biologist. Conducted a jurisdictional assessment of the Cattle Canyon Project which occurs along a portion of the East Fork of the San Gabriel River. Delineated the limits of jurisdiction within the floodplain of the River to determine if projects activities will result in any impacts to jurisdictional waters.

Pigeon Pass 37.8 Acre Property, City of Moreno Valley, Riverside County, California. Served as field biologist. Updated the jurisdictional delineation report for the project based on new definitions of limits of waters from CDFW. Based on the updated delineation report, regulatory agency permits were prepared for the proposed project. Permit applications were submitted to ACOE for a Nationwide Permit, Regional Water Quality Control Board for a 401 Certification, and CDFW for a streambed alteration agreement. Coordination with the resource agencies to provide updates and obtain the permits was also conducted.

Ascension Cemetery 60-Inch Storm Drain, City of Lake Forest, Orange County, California. Served as field biologist. Conducted a formal wetland delineation of potential waters of the U.S. for the Ascension Cemetery 60" Storm Drain Project which converted an existing drainage feature into an underground pipe to reduce erosion. A preliminary jurisdictional delineation report was prepared and permit applications were completed and filed with the regulatory agencies. A letter of permission application was submitted to ACOE, along with a 404(b)(1) Analysis, due to the site's location within a Special Area Management Plan area within the San Diego Creek Watershed. Also assisted the client with formulating an appropriate mitigation strategy to reduce project impacts.

Sand Canyon Mobile Home Bank Stabilization Project, City of Canyon Country, California. Served as field biologist. Prepared a 401 Certification Application on behalf of the client to the Los Angeles Regional Water Quality Control Board under the Clean Water Act. The Application was prepared for the client for emergency repairs to a severely eroded slope that threatened to damage existing homes. The repair was conducted to the bank of the Santa Clara River which is under the jurisdiction of the Regional Board.

SR 91 and SR 71 Interchange Improvement Project, City of Corona, California. Served as field biologist. Assisted in conducting a jurisdictional delineation for a 35-acre project site and surrounding 652-acre study area for areas potentially under the jurisdiction of the ACOE, Regional Water Quality Control Board, and CDFW. Prepared a written Habitat Assessment and MSHCP Consistency report, and Determination of Biologically Equivalent or Superior Preservation analysis.

Green Park Ranch Wetlands Delineation, City of Simi Valley, California. Served as field biologist. Assisted in conducting a wetland delineation on a 1,600-acre site in the City of Simi Valley. The survey was conducted to delineate the jurisdictional limits of ACOE Waters of the U.S. and CDFW Waters of the state. The wetland delineation was conducted as an update to previous wetland delineations conducted as part of preparation of the Runkle Canyon Specific Plan.

Hamner Avenue, City of Corona, California. Served as field biologist. Conducted a delineation of potentially jurisdictional waters for several drainages located adjacent to Hamner Avenue. The delineation involved taking measurements and mapping of all drainages and roadside ditches. The on-site drainages were determined to demonstrate connectivity with the nearby Santa Ana River.

Mitigation, Habitat Restoration, and Enhancement

LADWP Hollywood Water Quality Improvement Project, City of Los Angeles, California. Served as field biologist. Assisted in the monitoring of an ongoing restoration effort for the LADWP's Hollywood Water Quality Improvement Project at the Hollywood Reservoir in Southern California. The restoration effort was implemented in order to mitigate for impacts resulting from the project, specifically the loss of coastal sage scrub habitat.

Big Dalton Dam Sluiceway Rehabilitation Project, County of Los Angeles, California. Served as deputy project manager and project biologist. Managed the implementation of the Avoidance and Minimization Measures prescribed in the project's Streambed Alteration Agreement issued by CDFW. Surveys conducted included habitat assessments for southwestern willow flycatcher and least Bell's vireo, western pond turtle and aquatic species, bat surveys, nesting birds, rare plants, baseline water quality sampling, fish species, and downstream aquatic resources. Progress reports were prepared for submittal to CDFW.

Sierra Business Center, City of Fontana, California. Served as assistant project manager and field biologist. Coordinated the implementation of a 1-acre bioswale consisting of native riparian scrub species to provide first-flush water quality treatment of local water runoff. The bioswale was designed and implemented for mitigation for the construction of the adjacent business park. A report of as-built conditions was prepared

following the installation of native plants, followed by a monitoring period. The restoration site will be monitored for a minimum of 5 years with annual monitoring reports prepared to document progress and success of the restoration effort.

Morgan Valley Residential Development, City of Temecula, California. Served as assistant project manager. Coordinated the implementation of a Habitat Mitigation and Monitoring Plan, involving site preparation, irrigation installation, container and cutting planting, and seeding. The restoration site is mitigation for impacts made to riparian scrub vegetation along an unnamed creek as a result of construction of the Morgan Valley residential development. Conducted monthly and annual monitoring surveys and prepared annual monitoring reports to document performance.

Blackmore Restoration Project, Murrieta, County of Riverside, California. Served as assistant project manager. Conducted three years of quarterly and annual monitoring surveys for the Shea Homes – Blackmore restoration project. The mitigation for the restoration project involved the creation of riparian scrub habitat within a tributary to Murrieta Creek. Annual monitoring surveys involved qualitative and quantitative transect surveys to determine native and non-native species density. Quarterly monitoring involved assessing the site for any potential maintenance issues and removing exotic and invasive species. The project also involves an off-site mitigation area located within the same watershed further to the east. Agency correspondence and coordination was required to address the off-site mitigation and any on site issues.

Mosaic Development Project (Tract Map No. 28206), Menifee Area, County of Riverside, California. Served as project biologist. Conducted various monitoring surveys and maintenance visits for components of the Mosaic residential development restoration project. The project involves the creation of wetland habitat and preservation of on-site willow habitat. Surveys include a nesting bird survey and written report, and quarterly and annual monitoring surveys. Monitoring surveys focused on native vs. non-native species coverage, wetland determination, and recommendations for remedial measures for erosion and/or supplemental seeding. Surveys involved the subsequent preparation of a Notice of Completion of Installation (As-built) report and an Annual Mitigation Monitoring Report.

Adeline's Farm (Tract 29214) Project, French Valley, County of Riverside, California. Served as assistant project manager. Conducted quarterly and annual monitoring surveys for the Adeline's Farm development, Shea Homes, Murrieta Area, Riverside County. The mitigation for the restoration project involves the creation of bioswale habitat on site. Monitoring surveys also involve the preparation of an As-built report and Annual Mitigation Monitoring Report. Worked as the Project Manager with the client to recommend and formulate strategies for continued maintenance and increasing species coverage and diversity. Assisted in conducting a jurisdictional delineation of the site and downstream portion used for off-site mitigation credit for another project. Prepared augment for additional years of monitoring and coordinated with regulatory agencies for project sign-off at the completion of monitoring.

Canyon Heights Residential Development, Canyon Lake Area, County of Riverside, California. Served as field biologist. Conducted quarterly and annual monitoring surveys for the mitigation site associated with the Canyon Heights residential development. The mitigation site consists of a conservation area and a restoration area focused on restoring and improving coastal sage scrub and grassland habitat. Two water quality ponds are included in the mitigation site to provide first-flush water quality treatment of local water runoff. The main tasks for this project involved routine maintenance monitoring to ensure non-native species cover and invasive species remain at a minimum. Also conducted spring and fall avian surveys, as well as focused surveys for coastal California gnatcatcher as part of the perpetual mitigation monitoring plan.

Three Arch Bay Residential Development, Debris Basin Restoration, Monarch Beach, County of Orange, California. Served as field biologist. Conducted Participated in the clean-up, weed removal, slope stabilization, planting, monitoring and reporting for a 25-foot by 40-foot debris basin. The debris basin associated with the north portion

of the Three Arch Bay Residential Development was widened to allow additional nuisance flows to enter the basin without overflowing or causing erosion damage. The debris basin was recontoured and revegetated to recreate a native habitat area within native coastal sage scrub and chaparral. The slope was revegetated at the request of the property owner in an effort to increase the aesthetic value of the bare slope, aid in slope stabilization and add native habitat to the area.

Preserve and Land Management

Mt. Olympus Preserve, San Diego County, California. Served as field biologist. Conducted a complete flora and fauna inventory of species within the 707-acre Mt. Olympus Preserve, as part of a biodiversity study for the County of San Diego. Inventory techniques included small mammal trapping, pit-fall trapping, avian spot counts, motion-activated photography, scent station detection and acoustic monitoring for bats. The surveys were conducted between the late spring to early fall to observe the migration and blooming periods of various species in the region. The findings of the biodiversity study were prepared into a baseline biodiversity report, to be included as part of the finalized North County Multiple Species Conservation Plan. Tommy also assisted in preparation of a Public Access Plan for the Preserve.

Wilderness Gardens Preserve, San Diego County, California. Served as field biologist. Conducted a complete flora and fauna inventory of species within the Wilderness Gardens Preserve as part of a biodiversity study for the County of San Diego. Inventory techniques included small mammal trapping, pit-fall trapping, avian spot counts, motion-activated photography, scent station detection and acoustic monitoring for bats. The surveys were conducted between the late spring to early fall to observe the migration and blooming periods of different species in the region. The findings of the biodiversity study were prepared into a baseline biodiversity report, to be included as part of the finalized North County Multiple Species Conservation Plan.

Carlsbad Preserve, City of Carlsbad, San Diego County, California. Served as field biologist. Assisted with establishing monitoring plots for coastal sage scrub habitat within the Preserve for long-term monitoring. Field surveys were also conducted to determine post-fire conditions of the CSS habitat within the Preserve.

Tonner Canyon, City of Industry, California. Served as field biologist. Assisted as staff ecologist in collecting data for a Wildlife Corridor Study through the Tonner Canyon corridor. Data collection methods included avian spot counts, scent station detection, and motion-capture cameras. Avian spot counts recorded species flying over and under the State Route 57 overpass located over the canyon. The studies were conducted for a 1-year period for five consecutive days a month. The collected data was incorporated into a Wildlife Corridor Study Report.

Biological and Cultural Resources Monitoring

Tehachapi Renewable Transmission Project (TRTP) Construction Monitoring, Los Angeles, San Bernardino, and Riverside Counties, California. Served as field biologist. Conducted on-site construction monitoring for sensitive species during a portion of the Southern California Edison Tehachapi Renewable Transmission project. Construction monitoring entailed supervising various construction crews during transmission tower construction at various locations in Los Angeles, San Bernardino, and Riverside Counties. Monitoring activities also involved conducting pre-construction clearance surveys, monitoring plan compliance, daily and nightly spot checks, and routine reporting.

Pine Canyon Second Barrel Maintenance Monitoring, LADWP, California. Served as field biologist. Conducted a pre-construction clearance survey, worker training program, and construction monitoring during road maintenance of a small segment of the existing Second Aqueduct access north of California City, to protect Desert tortoise (*Gopherus agassizii*), Mohave ground squirrel (*Xerospermophilus mohavensis*), Le Conte's thrasher (*Toxostoma lecontei*), and Charlotte's phacelia (*Phacelia nashiana*).

Desert Hot Springs Wind Fence Installation Monitoring, California. Served as field biologist. Conducted on-site monitoring of the federally endangered Coachella Valley milk vetch during installation of a wind fence adjacent to Interstate 10. The monitoring effort included identifying all specimens of Coachella Valley milk vetch on-site and creating a buffer around each plant to ensure direct take of this species did not occur during project activities.

Construction Monitoring for Silverlake Reservoir, LADWP, Los Angeles, California. Served as field biologist. Conducted on-site construction monitoring of pit drilling at 3 locations within the Silverlake Reservoir facility. The monitoring effort included identifying all nesting birds within the project site and determining the extent of impacts that may occur to actively nesting birds. Monitored the effects of drilling on an active rookery of nesting great blue herons.

Disneyland Resort Parking Expansion Study Construction Monitoring, Anaheim, California. Conducted on-site construction monitoring of excavation and earth-moving activities for the construction of a parking lot structure for the Disneyland Resort. The monitoring effort focused on archeological/cultural resources that may be uncovered during excavating and earth-moving activities.

Construction of South Region High School No. 12, Los Angeles Unified School District, California. Conducted on-site construction monitoring of excavation and grading activities for the school site. The monitoring effort focused on archeological/cultural resources that may be uncovered during excavating and earth-moving activities.

Telecommunications

SAN-251 A, Cricket Wireless Telecommunications Facility, City of Escondido, San Diego County, California. Served as field biologist. Conducted a general habitat assessment and reconnaissance-level field survey to document existing biological resources and sensitive species on site. The survey involved assessing the surrounding area for sensitive wildlife species including coastal California gnatcatcher and habitat mapping. The results of the survey were prepared into a written biological resources letter report in accordance with the County of San Diego Multiple Species Conservation Program and draft Escondido Multiple Habitat Conservation Program guidelines. Monitored installation of an impact area fence prior to construction and conducted a nesting bird survey.

NEPA Compliance/Telecommunication Facilities, Southern and Central California. Conducted over 100 biological resource assessments for a variety of telecommunication providers throughout Southern and Central California in complying with NEPA for the implementation of cellular communication facilities. These projects includes the preparation of NEPA compliance documents in accordance with the Federal Communication Commission's regulations pertaining to telecommunication facilities, in particular, biological surveys, including focused sensitive species surveys, permitting, construction monitoring, and arborist surveys. The projects were also assessed for consistency with local relevant policies and habitat conservation plans.

Transportation

SR 91 and SR 71 Interchange Improvement Project, City of Corona, California. Served as field biologist. Conducted a general habitat assessment and MSHCP Consistency Analysis for the 35-acre project site and surrounding 652-acre study area. Surveys focused on assessing suitable conditions for burrowing owl, narrow endemic plant species, riparian/riverine areas, as well as sensitive species not covered under the MSHCP. Assisted in conducting a jurisdictional delineation for areas potentially under the jurisdiction of the U.S. Army Corps of Engineers (ACOE), Regional Water Quality Control Board, and CDFW. Prepared a written Habitat Assessment and MSHCP Consistency report, and Determination of Biological Equivalent or Superior Preservation analysis. Assisted in preparation of a Natural Environment Study for Caltrans and the Riverside County Transportation Commission.

Schnoor Avenue Bridge Undercrossing, City of Madera, California. Served as field biologist. Conducted a biological assessment survey for a proposed bridge undercrossing project involving the expansion of an existing pedestrian and bike trail beneath the existing Schnoor Avenue Bridge. The biological assessment was requested by Caltrans and the results of the survey were prepared in a Natural Environment Study (Minimal Impacts) report. The project also required a field visit with City and Caltrans staff to discuss impacts and potential issues, as well as conference calls to address reporting requirements.

Fulton Mall Project, City of Fresno, California. Served as biologist. Prepared the Biological Resources Section for an Initial Study for the Fulton Mall Project which involves the conversion of vehicle streets to pedestrian use for revitalization of the Mall and Downtown Area. Also, prepared a Natural Environment Study (Minimal Impacts) report to address potential impacts of the project on federally protected biological resources on the site due to a change in the use of existing roads and rights-of-way.

Baxter Road Project, Merced County, California. Served as biologist. Prepared the CDFW Streambed Alteration Agreement and RWQCB 401 Certification for replacement of the Baxter Road Bridge which spanned over Deadman Creek. An NES was used for the permit applications which documented the potential impacts of the proposed project, which included significant impact to California tiger salamander.

Specialized Training

- California Rapid Assessment Method (CRAM) Training. CRAM Wetlands. 2018
- Wetland Delineation Training. Wetland Training Institute. Certified Wetland Delineator. 2015.
- Noninvasive Acoustic Monitoring of Bats, Field Techniques Workshop. The Wildlife Society. Instructor Joe Szewczak, 2012.
- Bat Ecology and Field Techniques Workshop. The Wildlife Society. Instructors Joe Szewczak and David Johnston, 2010.
- 20 Plant Families Workshop. Rancho Santa Ana Botanical Gardens. Instructor, Bob Allen, 2009.

Publications

Moloo, Tommy. 2013. How Proper Planning and a General Understanding of Bats Help Reduce Impacts. Wind Power Engineering & Development Magazine. June 2013.

Presentations

“The Elusive Burrowing Owl,” 2011. Presented at Friends of the Newport Back Bay Symposium. Newport Beach, California.

Kimberly Narel

BIOLOGIST I

Kimberly Narel (*KIM-ber-lee na-REL*; *she/her*) is a biologist with 8 years' professional experience in biological environmental consulting. She conducts avian nest surveys, habitat assessments, biological monitoring, and protocol-level special-status species surveys. Ms. Narel has experience coordinating with state and federal agencies throughout the United States on behalf of the Federal Communications Commission and in support of Section 7 Endangered Species Act consultation pursuant to the National Environmental Policy Act (NEPA). She prepares various biological resources technical reports and documents in accordance with California Environmental Quality Act (CEQA) and NEPA processes.

Ms. Narel has strong field skills, with experience conducting habitat assessments and avian nesting surveys throughout the Pacific Northwest and the Southwest. She specializes in marine and terrestrial wildlife with a concentration on Southern California species. She has professional training and volunteer experience with special-status species, including Mojave desert tortoise (*Gopherus agassizii*), burrowing owl (*Athene cunicularia*), arroyo toad (*Anaxyrus californicus*), blunt-nosed leopard lizard (*Gambelia sila*), California red-legged frog (*Rana draytonii*), marine mammals, rare plants, and least Bell's vireo (*Vireo bellii pusillus*), as well as trapping for southwestern pond turtle (*Actinemys pallida*) and Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), throughout California.

Ms. Narel is also experienced with Habitat Conservation Plan (HCP) processes. She has worked under the Western Riverside Multiple Species HCP on Joint Project Reviews, the County of Orange Central/Coastal Natural Community Conservation Plan and Southern Subregion HCP, the County of San Diego (South County) Subarea Plan, and the City of San Diego Multiple Species Conservation Subarea Plan.

Project Experience

Municipal

Bedford Canyon Channel Project, Riverside County Flood Control District, Corona, California. Conducted focused burrowing owl surveys per Western Riverside County Multiple Species HCP protocols and drafted the California Department of Fish and Wildlife (CDFW) burrowing owl survey report. Assisted in conducting a bat presence/absence survey using visual and acoustic (sonar) analysis. Prepared the Determination of Biologically Equivalent or Superior Preservation Report. (2022-2024)



Education

University of California, San Diego
BS, Biology: Ecology, Behavior and Evolution; Minor, Environmental Systems; 2014

Certifications

Wetland Delineator
SCUBA Autonomous Diver
Occupational Safety and Health Administration (OSHA) 40-Hour
HAZWOPER

Cetacean Naturalist

Marine Corps Base
Camp Pendleton
Range Safety Officer

Professional Affiliations

The Wildlife Society
American Cetacean Society

Ben Clark Training Center Modernization Project, Riverside County Sheriff's Department, Riverside, California. Conducted a biological reconnaissance and focused burrowing owl surveys following Western Riverside County Multiple Species HCP protocols. Prepared the CDFW burrowing owl focused survey results report and a biological technical report with CEQA-level impact analysis. (2022)

Big Dalton Dam and San Dimas Dam Helipad and Access Road Improvement Projects, Los Angeles County Department of Power and Water, Los Angeles, California. Conducted a biological reconnaissance and prepared a biological constraints due diligence memorandum detailing existing biological resources, recommended focused species surveys, mitigation measures, and applicable local, regional, state, and federal policies. (2021)

CALTRANS Highway 79 Extension Project, CALTRANS, San Diego, California. Conducted an arroyo toad habitat assessment and assisted in preparing the habitat assessment report. (2024)

Effluent Transmission Main Air Valve Replacement Project, South Orange County Wastewater Authority, Orange County, California. Conducted a biological reconnaissance and prepared the biological technical report. (2024)

El Toro Water District Filter Plant Project, El Toro Water District, Mission Viejo, California. Drafted a biological due diligence memorandum detailing existing site conditions, potential biological constraints, and recommended mitigation measures to reduce project impacts to biological resources. (2022)

El Toro Water District Pump Station and Joint Transmission Main Project, El Toro Water District, Laguna Woods, California. Completed a biological reconnaissance and prepared the biological resources section of the initial study (IS)/mitigated negative declaration (MND) to incorporate survey results and analyze proposed project impacts under Appendix G of CEQA Guidelines. Recommended focused species surveys and mitigation measures to reduce project impacts to biological resources to a less-than-significant level under CEQA. (2022)

Fairmount Avenue Fire Station Project, City of San Diego, San Diego, California. Conducted a biological reconnaissance, an updated jurisdictional delineation, and assisted in preparing the biological letter report and biological resources section of the EIR. (2024)

Fuel Modification Project, Emerald Bay Service District, Laguna Beach, California. Prepared a nesting bird survey proposal prior to vegetation clearing and fuel modification activities. Met with Emerald Bay Service District staff, maintenance crew, and Orange County Parks staff during a pre-construction kickoff meeting to answer questions regarding nesting bird mitigation measures. (2022, 2023)

Moulton Niguel Water District Salinity Management Project, Laguna Niguel, California. Conducted a biological reconnaissance and prepared the biological resources section of the Initial Study/Mitigated Negative Declaration. (2024)

North Coast Interceptor Reach 5 Replacement Project, City of Laguna Beach, Laguna Beach, California. Conducted a biological reconnaissance, focused least Bell's vireo surveys, and assisted in preparing the biological letter report and biological resources section of the Initial Study/Mitigated Negative Declaration. (2024)

Wildlife Resources Center Project, Orange County Fire Authority, San Clemente, California. Conducted a biological reconnaissance and prepared the biological technical memorandum. (2024)

Otay and Alta San Diego County Communication Tower Project, AJM Ecological Solutions, San Diego, California. Conducted a biological reconnaissance and prepared the biological constraints analysis memorandum per San Diego County Resource Protection Ordinance. (2024)

Peters Canyon Wash Maintenance Project, Orange County Public Works, Irvine, California. Conducted biological monitoring, active acoustic bat presence/absence surveys, and trapping for western pond turtles. Conducted biological monitoring during vegetation maintenance and sediment removal activities. Prepared biological survey and monitoring results reports. (2022-2024)

Regional Treatment Plant Salinity Management System, Moulton Niguel Water District, California. Conducted the biological reconnaissance and prepared the biological resources section of an IS/MND pursuant to CEQA Appendix G Guidelines. (2023–2024)

San Timoteo Canyon Road Traffic Signal Project, Riverside County Transportation District, Riverside County, California. Conducted a Western Riverside MSHCP habitat assessment and prepared the accompanying biological technical report and Determination of Biologically Equivalent or Superior Preservation Report. (2024)

Wastewater Treatment Facility and Utility Infrastructure Project, Sycuan Band of the Kumeyaay Nation, San Diego, California. Assisted in conducting focused diurnal and nocturnal arroyo toad surveys in Sweetwater River in support of a proposed utility corridor and sewer collection system in the Sycuan Reservation. (2023)

Well 25 Treatment Site Project, Western Municipal Water District, Riverside, California. Conducted a biological reconnaissance and prepared a NEPA-compliant biological technical memorandum to analyze biological constraints for municipal groundwater well and treatment plant improvements. (2023)

Planning

Regional Conservation Authority, Western Riverside County Multiple Species HCP–Joint Project Review, Riverside, California. Assisted in reviewing projects located within a Criteria Area of the Western Riverside County Multiple Species HCP for project consistency on behalf of the Regional Conservation Authority. (2023–2024)

Talbert Regional Park Master Plan Project, Orange County Public Works, Costa Mesa, California. Conducted a revised biological reconnaissance of Talbert Regional Park to map any changed vegetation communities. Updated the biological technical report with focused species survey results and CEQA-level impact analysis. (2022)

Yucaipa Freeway Corridor Specific Plan Project, City of Yucaipa, California. Conducted a biological reconnaissance and focused surveys for least Bell's vireo. Assisted in conducting a jurisdictional wetland delineation of potential aquatic resources on site. (2022)

Industrial

6th Street and Del Rosa Warehouse Project, Patriot Development Partners, Highland, California. Conducted a biological reconnaissance, and prepared a biological technical report and the biological resources section of the IS/MND, to analyze project impacts under Appendix G of CEQA Guidelines. (2022)

4th Street and Hermosa Avenue Warehouse Project, Patriot Development Partners, Rancho Cucamonga, California. Conducted a general biological reconnaissance and prepared a due diligence memorandum to detail existing conditions and analyze proposed project impacts to biological resources on the project site in support of a Class 32 Categorical Exemption. (2022)

Apple Valley Warehouse Project, Uncommon Developers, Hesperia, California. Conducted protocol-level focused rare and desert native plant surveys and focused Mojave desert tortoise presence/absence surveys. (2022)

Cemax Warehouse Project, Covington Development Partners, Victorville, California. Conducted a biological reconnaissance survey and prepared an accompanying due diligence memorandum to document the results of existing biological resources and potential biological constraints to future site development as well as recommend focused species presence/absence surveys. (2022)

Nance Street Warehouse Project, Oakmont Industrial Group, Perris, California. Conducted a biological reconnaissance and prepared the biological resources section of the IS/MND to detail existing conditions on site and analyze potential impacts to biological resources under Appendix G of CEQA Guidelines. (2022)

North Stoddard Warehouse Project, Covington Development Partners, Victorville, California. Conducted a biological reconnaissance survey and prepared an accompanying due diligence memorandum to document the results of existing biological resources and potential biological constraints to future site development as well as recommend focused species presence/absence surveys. (2022)

North Victorville Warehouse Project, Covington Development Partners, Hesperia, California. Conducted a biological reconnaissance survey of the project site to map vegetation communities, compiled a list of observed species, and determined potential biological constraints to future site development. (2022)

NWC Santa Ana and Almond Warehouse Project, Patriot Development Partners, Fontana, California. Conducted a biological reconnaissance of the project site to map vegetation communities, compiled a list of observed species, and determined potential biological constraints to future site development. (2022)

Poplar 8 Warehouse Project, Covington Development Partners, Hesperia, California. Conducted a general biological resources assessment concurrently with habitat assessments for burrowing owl and Mohave ground squirrel (*Xerospermophilus mohavensis*). Prepared a biological technical report to detail the results of the surveys with a CEQA-level project impact analysis. Prepared the accompanying burrowing owl translocation plan. (2022)

San Jacinto and McLaughlin Warehouse Project, Patriot Development Partners, Menifee, California. Conducted a biological reconnaissance, focused burrowing owl surveys, formal aquatic resources jurisdictional delineation, and prepared the accompanying biological resources section of the IS/MND, biological technical report, aquatic resources delineation report, and focused burrowing owl survey results report. (2023)

Santa Ana and Almond Warehouse Project, Patriot Development Partners, Fontana, California. Prepared a biological resources letter report detailing the results of existing biological resources on site and potential biological constraints. Incorporated results into the biological resources section of the IS/MND to analyze project impacts under Appendix G of CEQA Guidelines. (2022)

Santa Fe and Valley View Warehouse Project, Patriot Development Partners, San Bernardino, California. Conducted a biological reconnaissance and prepared a biological resources letter report to detail the existing conditions on site, analyze potential project impacts to biological resources, and recommend mitigation measures to reduce project impacts to biological resources to a less-than-significant level under CEQA. (2022)

Stoddard Wells Distribution Center Project, Covington Development Partners, Indio, California. Conducted a biological reconnaissance and prepared a biological constraints due diligence memorandum detailing existing conditions on site and focused survey recommendations. Conducted a focused Mojave desert tortoise presence/absence survey. (2021)

Willow and Valley Warehouse Project, International Business Group, Rialto, California. Conducted a biological reconnaissance and prepared the biological resources section of the IS/MND to incorporate survey results and analyze project impacts under Appendix G of CEQA Guidelines. Prepared a focused burrowing owl survey proposal and conducted the subsequent focused burrowing owl surveys following CDFW protocols to determine presence/absence on site. (2022)

Development

2 Via Terracaleta Property, Gordon Barienbrock, San Clemente, California. Conducted an updated biological reconnaissance and prepared the revised biological resources memorandum. (2024)

31180 and 31164 Ceanothus Drive Properties, Horst Architecture, Laguna Beach, California. Conducted biological reconnaissance surveys for two proposed residential developments and prepared the biological letter reports pursuant to City of Laguna Beach Local Coastal Program and California Coastal Commission Coastal Development Permit requirements. (2022)

328 Avenida Gaviota Renovation Project, The Gasparini Family, San Clemente, California. Conducted a biological reconnaissance survey and prepared a biological letter report to discuss the results of the biological reconnaissance and analyze potential project impacts to Environmentally Sensitive Habitat Areas, as directed by the California Coastal Commission, for a Coastal Development Permit application. (2022)

Baxter and Whitewood Apartments Project, Murrieta Whitewood Multifamily LLC, Murrieta, California. Conducted focused burrowing owl surveys per Western Riverside County Multiple Species HCP protocol. Prepared the accompanying CDFW burrowing owl focused survey results report. (2022)

Boutique Hotel Project, Dadashi Developments, Dana Point, California. Conducted a biological reconnaissance and prepared a biological letter report to describe the results of the biological reconnaissance, determine whether Environmentally Sensitive Habitat Areas occur on site, and analyze project impacts to biological resources under the City of Dana Point Local Coastal Program's Biological Resources Policy for a Coastal Development Permit. (2022)

Bureau of Indian Affairs Fee to Trust Pechanga Northern Boundary Property Project, Pechanga Band of Indians, Temecula, California. Conducted a biological reconnaissance and prepared a biological resources technical memorandum detailing the survey results and recommended focused species presence/absence surveys. (2022)

Canyon Crest Development Project, Lennar, Escondido, California. Conducted a biological reconnaissance and prepared the biological constraints letter report. (2024)

Corona Affordable Housing Project, 2nd St. Family LP, Corona, California. Conducted a biological reconnaissance and prepared the NEPA biological technical memorandum for Housing and Urban Development. (2024)

Fallahzadeh Residence Project, Dana Point, California. Conducted a biological reconnaissance and prepared a biological letter report to describe the results of the biological reconnaissance, determine whether Environmentally Sensitive Habitat Areas occur on site, and analyze project impacts to biological resources under the California Coastal Commission for a Coastal Development Permit. (2023)

Golden Way Development Project, City Ventures, Poway, California. Conducted a biological reconnaissance and prepared the biological constraints letter report. (2024)

Greenberg Apartments Project, Murrieta Whitewood Multifamily LLC, Murrieta, California. Conducted focused burrowing owl surveys per Western Riverside County Multiple Species HCP protocol. Prepared the accompanying CDFW burrowing owl focused survey results report. (2022)

Jefferson Murrieta Apartments Project, JPI Companies, Murrieta, California. Conducted focused burrowing owl surveys and assisted in conducting a jurisdictional delineation on the project site. Prepared a biological technical report to detail existing conditions, share the results of focused species surveys, and analyze project impacts to biological resources under CEQA. Assisted in drafting an aquatic resources delineation report. (2022–2023)

Juniper Avenue and Valley Boulevard Apartment Project, JPI Companies, Fontana, California. Conducted a due diligence site visit to determine existing conditions and prepared a biological constraints memorandum detailing the results and potential on-site biological constraints. Prepared a biological technical report with CEQA-level project impact analysis. (2022)

La Paz Senior Village Housing Project, Aliso Viejo, California. Conducted a biological reconnaissance and prepared the biological resources section of the Initial Study/Mitigated Negative Declaration. (2024)

Menifee Business Park Project, Patriot Development Partners, Menifee, California. Conducted a biological reconnaissance, jurisdictional delineation, and focused burrowing owl surveys. Prepared the biological technical report with a CEQA-level project impact analysis, burrowing owl survey report, aquatic resources delineation report, and Determination of Biologically Equivalent or Superior Preservation Report(2022–2024)

Nirvana Project, OnPoint, San Diego, California. Assisted in preparing the NEPA biological assessment for USACE to address unavoidable impacts to least Bell's vireo, coastal California gnatcatcher, wetlands, and San Diego ambrosia. (2024)

Oceanside Blocks 5 & 20 Project, City of Oceanside, Oceanside, California. Conducted a biological reconnaissance and prepared the biological conformance review memorandum for the EIR addendum. (2024)

Paseo Adelanto Permanent Supportive Housing Project, Jamboree Housing Corporation, San Juan Capistrano, California. Conducted a biological reconnaissance and prepared a biological resources technical memorandum detailing the results of the biological reconnaissance and recommended mitigation measures for project implementation in support of obtaining a Federal Emergency Management Agency Conditional Letter of Map Revision. (2022)

Tampico Motel Permanent Supportive Housing Project, City of Anaheim, California. Conducted a biological assessment for federally protected resources and prepared a NEPA-complaint biological technical memorandum. (2023)

Energy

Compass Battery Energy Storage Systems Project, Broad Reach Power, San Juan Capistrano, California. Conducted focused least Bell's vireo surveys and prepared the biological resources analysis for the California Energy Commission Assembly Bill 205 Filing application package. (2023)

Charger and Seguro Battery Energy Storage Systems Project, AES Clean Energy, Escondido, California. Assisted in conducting a jurisdictional wetland delineation for revised project boundaries and updated the accompanying aquatic resources delineation with the survey results. (2022)

Double Butte Battery Energy Storage System Project, AES Clean Energy, Menifee, California. Prepared a Determination of Biologically Equivalent or Superior Preservation Report (DBESP) per the Western Riverside County Multiple Species Habitat Conservation Plan to address unavoidable impacts to Section 6.1.2 Riparian/Riverine Resources. (2024)

Nighthawk Energy Storage Project, Nighthawk Energy LLC, Poway, California. Assisted in preparing a biological technical report to assess existing site conditions, detail the results of focused species surveys, and analyze impacts to on-site biological resources within the City of San Diego Multiple Species Conservation Program Subarea Plan. (2022)

Resource Management

County Wildlife Damage Management Program, California Department of Food and Agriculture, Wildlife Services, and U.S. Department of Agriculture Animal Plant and Health Inspection Service, California. Assisted in drafting a biological technical report in support of a joint environmental impact report/environmental impact statement, as required by CEQA and NEPA, to provide a biological analysis of current and proposed future wildlife damage management activities, which prevent damage to agricultural resources and infrastructure throughout California. (2022)

Whittier Narrows Restoration Project, HRS and Eco Inc., Los Angeles, California. Conducted a pre-construction avian nesting survey, focusing on least Bell's vireo, prior to herbicide application and invasive vegetation removal on site. (2022)

Rancho Mission Viejo Habitat Reserve Management Action Plan, Rancho Mission Viejo Land Trust, Orange County, California. Conducted biological monitoring activities in the Rancho Mission Viejo Habitat Reserve, including riparian bird monitoring protocol point count surveys, long-term oak woodland vegetation monitoring, ruderal dry matter grazing removal analysis, and vegetation community mapping updates. (2022–2024)

Relevant Previous Experience

Natural Resource Reviews and NEPA Technical Reports, EBI Consulting, Various Locations. Prepared and reviewed hundreds of Natural Resource Reviews in compliance with NEPA for telecommunication tower construction projects throughout the United States. Conducted desktop review of federal lands, flood hazards, wetlands, critical habitats, wild and scenic rivers, and federally and state-listed species that may occur within the project area. Consulted on behalf of the Federal Communications Commission for projects requiring concurrence with the U.S. Fish and Wildlife Service, CDFW, and other state regulatory agencies. Assisted in compiling final NEPA Finding of No Significant Impact reports, which incorporate Natural Resource Reviews with the federal tribal and historic/ cultural resource impact reviews. (2019–2021)

Pre-construction Presence/Absence Special-Status Species Surveys, Biological Assessments, and Avian Nest Surveys, EBI Consulting, Various Locations. Completed biological assessments for telecommunication facility projects throughout California, Oregon, Washington, Nevada, and Arizona for NEPA Natural Resource Reviews and other technical reports. (2019–2021)

Specialized Training

- **Introduction to Plant Identification Professional Workshop, California Native Plant Society, Big Bear, California.** Completed a three-day course covering basic plant morphology with a focus on the structures necessary for plant identification. Classroom and fieldtrips covering the basic characteristic of the 15 most common plant families in California. (2024)
- **Marine Corps Base Camp Pendleton Range Safety Officer, San Diego, California.** Certified as an Administrative Range Safety Officer to conduct habitat assessments unescorted throughout base range and training areas. (2023)
- **Introduction to the Mojave Desert Tortoise, Mojave Desert Tortoise Council, Ridgecrest, California.** Completed two 5-hour online lectures and one 8-hour field workshop reviewing Mojave desert tortoise life history, survey methods, data collection, health and disease, and current regulations and permitting. (2023)
- **Wetland Delineation Training, Wetland Training Institute, Orange County, California.** Completed two 8-hour wetland delineation field days and a 40-hour online training course on jurisdictional delineations and U.S. Army Corps of Engineers wetland delineation field methods for the Arid West Region. (2022)
- **California Red-Legged Frog Level I Professional Workshop, The Wildlife Project, Sonoma Mountain Preservation, California.** Workshop included four continuing education hours and eight direct observable hours in the field, identifying, collecting, and learning about the life histories of special-status amphibians found in Northern California. (2020)
- **Cetacean Naturalist Training Program, American Cetacean Society, Orange County Chapter, California.** Continuing education course consisting of lectures, mentoring, and whale-watching offshore. Learned about the life histories, habitat requirements, and identification of marine mammals observed in Southern California. Assisted as a whale-watcher on board vessels off of Newport and Dana Point Harbors. (2019)