

MEMORANDUM

To: Patrick Brown, Soitec
From: Brock Ortega, Principal, Senior Wildlife Biologist
Subject: Review of Bat Data Related to Soitec Boulevard Portfolio
Date: September 9, 2014
cc: Josh Saunders, Dudek
Asha Bleier, Dudek
Attachment(s): Figures 1 and 2, Resume

Due to the special-status elevation of Townsend's big-eared bat (*Corynorhinus townsendii*; Townsend's) to state Candidate Species on December 11, 2013, Dudek has prepared the following memorandum to address the species' potential to occur within the Soitec Solar Development Project (Proposed Project) project area.¹ A state Candidate Species is one that the California Fish and Game Commission (FGC) has formally declared a Candidate Species and generally receives the same protections as listed species. Little is known about the distribution of this species in Southern California; however, Dudek recently performed long-term bat sampling within the project area for another project in the vicinity. The data cache from recent long-term bat sampling was analyzed by Dudek to characterize the potential for Townsend's big-eared bat to occur within the Proposed Project area. Data collection and analysis methods are described below and results of the analysis are provided at the end of this memorandum.

DATA COLLECTION

Townsend's big-eared bat is distributed throughout California, but is most common in mesic habitats (Zeiner et al. 1990). Townsend's big-eared bat roosts in caves, tunnels, or mines, and the maternity roosts usually consist of small groups of less than 100 individuals (Zeiner et al 1990). Townsend's big-eared bat feeds mainly on moths and sometimes soft bodied insects that they find at night by using echolocation (Zeiner et al. 1990). Mating occurs between November and February, and one offspring is born between May and June (Zeiner et al 1990). Hibernation occurs from October through April (Zeiner et al 1990).

¹ The Proposed Project consists of the Tierra del Sol, Rugged, LanEast, and LanWest solar farms. The Tierra del Sol and Rugged solar farms are analyzed at a project-level; however, the LanEast and LanWest solar farms are analyzed as a programmatic level of detail.

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While little information exists and no specific data regarding Townsend's big-eared bat was collected on the Proposed Project site, Dudek performed long-term bat sampling within the Proposed Project area at the Jewel Valley Wind North and South sites (see Figure 1). As shown on Figure 1, the south site occurs almost directly adjacent to the Tierra del Sol solar farm site and includes areas that may be included as mitigation for the Soitec project. The north site is situated in the McCain Valley and is located northwest of the Rugged, LanEast, and LanWest solar farm sites.

Dudek conducted passive acoustic bat surveys to determine general bat presence, activity levels, and species composition in the area. Dudek utilized broadband acoustic detectors (Anabat SD2) that were programmed to record bat calls each day from one half-hour before sunset to one half-hour after sunrise each day of the study. These surveys occurred from September 2011 through September 2012. Dudek attached two bat echolocation microphones to three meteorological (MET) towers on the Jewel Valley sites. The MET tower locations are depicted on Figure 1. On each MET tower one microphone was mounted approximately 15 feet from the ground (low mic), and the second microphone was mounted near the top, approximately 200 feet from the ground. The microphone enclosures were fitted with Plexiglas sound reflector plates positioned at 45° below horizontal so that the angle of the call reception was pointed upward at 45°. The Anabat detector was powered by a 12-volt battery that was recharged daily by a 10-watt solar panel attached to the tower. The active microphones were rotated between the two heights on a bi-weekly basis to ensure bat calls were recorded at different heights.

Dudek retrieved and downloaded data on a bi-weekly basis throughout the sampling period. The amount of data collected provides a relative comparison of the number of potential calls gathered and attendant peaks. At the conclusion of the effort, Dudek had amassed 22,056 MB of data that had to be analyzed. Because the Jewel Valley Wind Project was never carried forward, the amassed data has not been analyzed until now.

It should be noted that while surveys occurred from September 2011 through September 2012, there have been few (if any) appreciable changes in the vicinity of the survey area that would suggest a potentially substantial difference in bat presence, activity levels, and species composition. It is standard practice to use any and all existing information to build an assessment of the resources present at a site or area (e.g., the use of California Natural Diversity Database (CNDDDB) data). Furthermore, from a biological information standpoint, the passage of time since the September 2012 cessation of surveys is inconsequential. As such, it is reasonable to assume the survey data collected are still accurate and representative of current conditions.

DATA ANALYSIS

The acoustic data were analyzed for species identification. Dudek made the species-level identifications using the methods of O’Farrell et al. (1999) based on frequency characteristics, call shape, and comparison with a comprehensive library of vocal signatures developed by Dr. O’Farrell and his colleagues. Species richness (number of species verified as present) was obtained for each MET tower location. An index of abundance, or the magnitude of each species’ contribution to spatial use, was obtained using the sum of 1-minute time increments for which a species was detected as present, divided by the number of nights of sampling (Miller 2001). This metric is useful when determining how much comparative use a site is receiving.

RESULTS AND DISCUSSION

The analysis of the data found that 16 species were identified during the year-long study. These species are listed in Table 1, Bat Data Results by Location (Index of Abundance), below. An Index of Abundance is a statistical tool that measures the relative size of a population or sub-unit of a population when incomplete counts are utilized. The Index of Abundance is assumed to be proportional to the true abundance of targeted species and is therefore used below to characterize the abundance of bat species in the Proposed Project area. The benefit of using this technique is that proper weight is applied to the data independent of the number of survey days. This data may also be paired with other regional data to provide a more robust characterization of abundance. [Overall, the Index of Abundance was only 19 for Townsend’s at all three MET towers combined, with 11 detected at the northern MET tower and 4 at both the southeastern and southwestern MET towers respectively. This compares to 2,088 total detections combined, with 604 at the northern MET tower, 749 at the southeast MET tower, and 728 at the southwest MET tower. Townsend’s represented 0.9% (19/2,088) of the total bat abundance. Townsend’s was most frequently detected at the northern MET tower, where it accounted for 1.8% of the detections (11/604). Table 1 provides specific bat data results by location.

Table 1
Bat Data Results by Location (Index of Abundance)

Species	North MET Tower	Southeast MET Tower	Southwest MET Tower	Total
<i>Antrozous pallidus</i>	3	4	4	11
<i>Corynorhinus townsendii</i>	11	4	4	19
<i>Eptesicus fuscus</i>	26	8	8	42
<i>Eumops perotis</i>	7	16	16	39
<i>Lasiurus cinereus</i>	12	11	11	34
<i>Lasiurus xanthinus</i>	2	2	2	6
<i>Myotis californicus</i>	10	3	2	15
<i>Myotis ciliolabrum</i>	74	97	95	266

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Table 1
Bat Data Results by Location (Index of Abundance)

Species	North MET Tower	Southeast MET Tower	Southwest MET Tower	Total
<i>Myotis evotis</i>	0	6	0	6
<i>Myotis thysanodes</i>	0	3	3	6
<i>Myotis volans</i>	62	388	379	829
<i>Myotis yumanensis</i>	6	14	14	34
<i>Nyctinomops femorosaccus</i>	54	20	20	94
<i>Nyctinomops macrotis</i>	0	1	1	2
<i>Parastrellus hesperus</i>	287	113	111	511
<i>Tadarida brasiliensis</i>	50	59	58	167
Grand Total	604	749	728	2,088

With regard to timing of activity, Table 2 shows that Townsend's maintained a low-level of activity nearly year-round with the exception of November and January. The bat population in general was greater during the spring and summer periods with much reduced activity during the fall and winter. The abundance patterns between Townsend's and the other bat species appear to be similar, although Townsend's occurs at a much reduced level. This increased abundance occurs when we would expect Townsend's, and likely other bat species, to be pup rearing. Low abundance is when we would expect hibernation to occur.

Table 2
Townsend's Index of Abundance (IA) by Month and Location
Compared to All Other Species

Location	2011				2012									
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	TOT
North MET Tower-Monthly IA ¹	0	0	0	0	3	17	26	13	16	17	10	3	7	11
Southeast MET Tower-Monthly IA ¹	17	6	0	0	0	0	3	3	0	10	3	0	11	4
Southwest MET Tower – Monthly IA ¹	11	20	0	0	6	0	0	3	0	0	0	0	30	4
Total Monthly IA – Townsend's	28	26	0	0	9	17	29	19	16	27	13	3	48	19

Table 2
Townsend’s Index of Abundance (IA) by Month and Location
Compared to All Other Species

Location	2011				2012									
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	TOT
All Other Bat Species														
Total Monthly IA ²	2289	665	606	77	122	376	1500	2483	2929	2253	2791	646	2159	2088

Notes:

- ¹ Monthly IA calculations are independent of the Total (TOT) column. The TOT column represent the total study period IA. This is roughly the average of the monthly IAs however; slight differences occur due to the varying number of days within each month and the corresponding differences in calculating IA.
- ² This data row represents the total IA for all other bat species detected during the study period for each month. The methods are similar to that discussed above under Note 1.

A review of CNDDDB data indicates that there are three known locations of Townsend’s big-eared bat occurrences within a 10-mile radius of the Proposed Project sites. These are all located in the La Posta Creek watershed (see Figure 2). The nearest recorded occurrence of Townsend’s big-eared bat is located approximately 9.75 miles northwest of the Tierra del Sol solar farm site and approximately 7.75 miles northwest of the Rugged solar farm site (see Figure 2). A review of U.S. Geologic Survey (USGS) topographic maps indicates that there are clusters of mine shafts, prospects, and caves located in and around McCain Valley, approximately 5.2 miles west of the Proposed Project area, and in the Jacumba and In-Ko-Pah Mountains, approximately 3.8 miles east of the Proposed Project area. Also, there are a few isolated mines or prospects located approximately 3.3 miles northeast of the Tierra Del Sol solar farm site and 1.4 miles south of the LanEast solar farm site.

CONCLUSION

Based on the data analyzed and information presented above, there appear to be low levels of Townsend’s that occur in the vicinity of the Proposed Project. Furthermore, the abundance of Townsend’s appears to be comparatively low, and not only are mine and cave resources not prevalent in the area, but also they are not present within the Proposed Project. This species does not have a potential to roost or establish nurseries within the Proposed Project site due to the lack of cave or mine resources or structures which might mimic those resources. Concentrations of mine and cave resources only appear to be east and west of the Proposed Project.

It is expected that the limited occurrence of Townsend’s in the vicinity, combined with no known detections on site, and lack of known mine or cave resources on the Proposed Project area, would limit the potential for Townsend’s to be either directly or indirectly impacted by


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the Proposed Project during construction and operations. If foraging over the any of the Proposed Project sites, Townsend's would not be expected to collide with the equipment, including concentrator photovoltaic (CPV) trackers, transmission lines, operations and maintenance facilities, and substations, since the bat would be able to "see" these project features using echolocation. In essence, the bats would be able to see and avoid any stationary obstacles much like they would be able to see and avoid other structures in their environment including cave openings, boulders, hills, trees, and buildings. Lastly, Townsend's would not be expected to roost or raise pups on or near the Proposed Project sites due to their lack of cave or mine resources, or structures which might mimic those resources.

CERTIFICATION

This memorandum has been prepared by Mr. Brock Ortega. Mr. Ortega is a County of San Diego-approved CEQA Consultant for Biological Resources.



Brock Ortega
Principal, Senior Wildlife Biologist

*Att: Figure 1
Figure 2
Resumes*

REFERENCES

- O, Farrell, Michael J., B.W. Miller, and W.L. Gannon. 1999. "Qualitative Identification of Free-Flying Bats Using the Anabat Detector." *Journal of Mammology* 80(1): 11–23.
- Zeiner, D.C., W.F. Laudenslayer Jr., K.E. Mayer, and M. White, eds. 1990. *California's Wildlife: Volume III. Mammals*. Sacramento, California: California Department of Fish and Game.

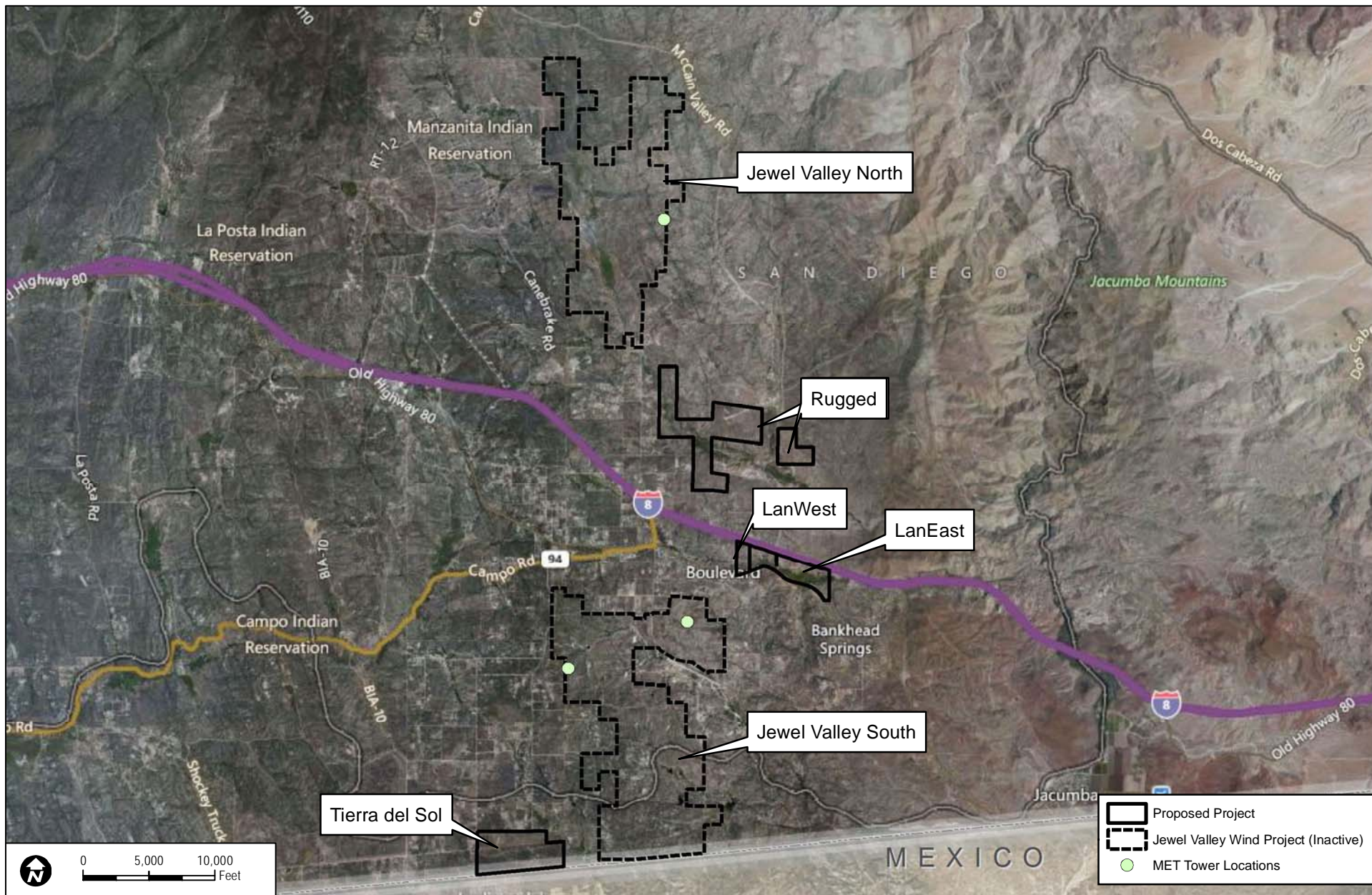
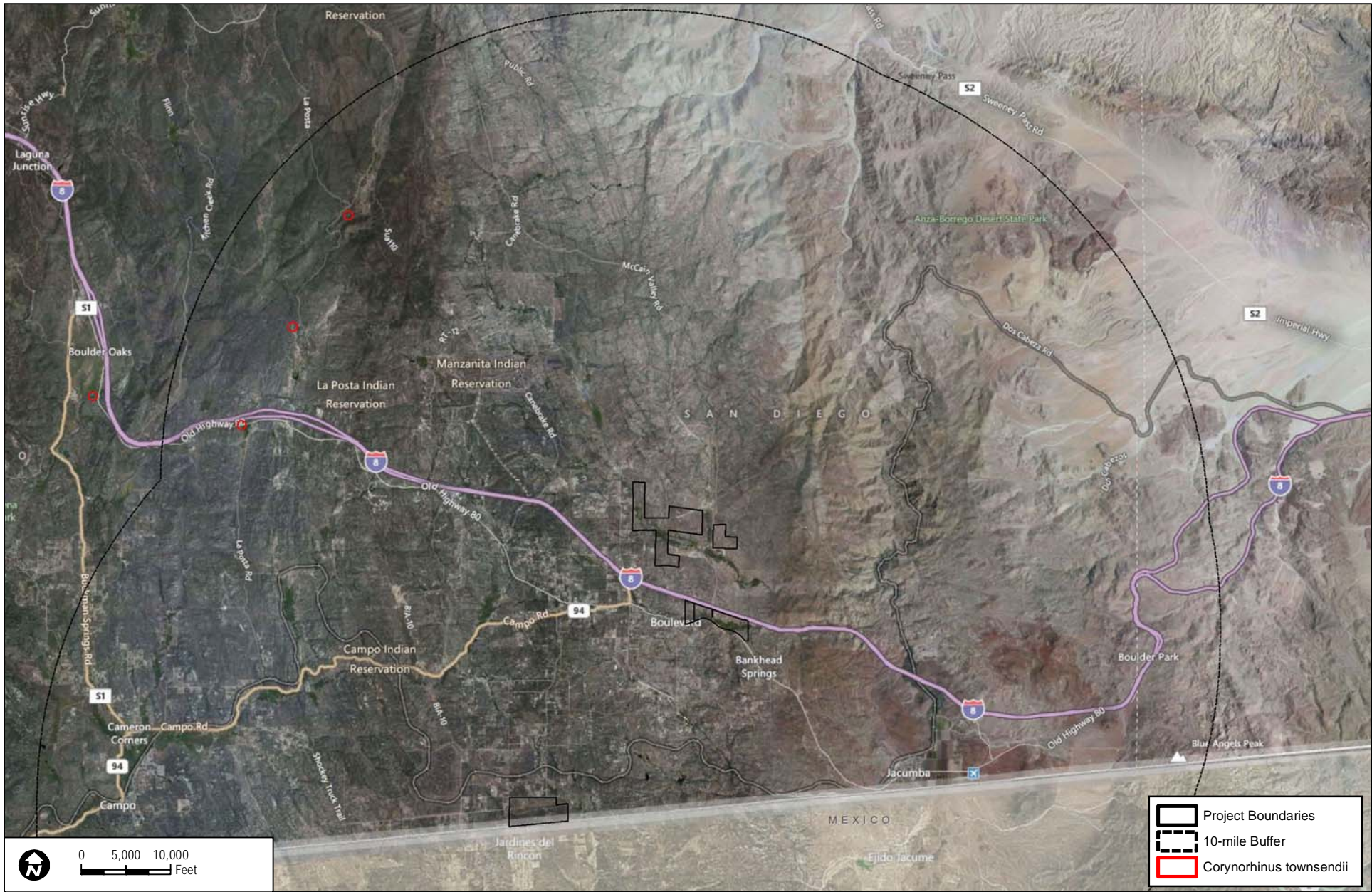


FIGURE 1
MET Tower Locations



DUDEK

SOURCE: Bing Maps 2014; CNDDDB 2014

7345

SOITEC SOLAR DEVELOPMENT PROGRAM

FIGURE 2
CNDDDB Occurrences - Townsend's big-eared bat

ATTACHMENT A
Resume

ATTACHMENT A

Resumes

Brock Ortega – Principal, Senior Wildlife Biologist

Brock Ortega has over 22 years' experience as a wildlife biologist. He brings extensive expertise to his project teams in many areas, including mitigation monitoring, permitting issues related to wetland resources and threatened or endangered species, wildlife biology and management, ecological assessment, environmental impact assessment and mitigation, habitat remediation, endangered species management plan authorship, and project management. Mr. Ortega has conducted over 30,000 hours of focused and general wildlife surveys during his professional career.

Mr. Ortega has pioneered several applied wildlife study techniques at Dudek, including acquisition of 6 passive and active bat detection devices and software, implementation of a training program for staff, and acquisition of thermal imaging equipment for bat study. He has also pioneered wildlife movement and corridor studies, reptile trapping arrays, wildlife modeling, and helicopter mapping of vernal pools for Dudek.

Mr. Ortega is a recognized qualified surveyor for a number of listed and rare amphibian and mammal species and has federal permits for several species. He is U.S. Fish and Wildlife Service (USFWS)–authorized as an arroyo toad (*Bufo californicus*) emergency handler; USFWS and California Department of Fish and Game (CDFG)–qualified to survey San Joaquin kit fox (*Vulpes macrotis mutica*) throughout its range; and USFWS and U.S. Forest Service (USFS)–qualified to survey arroyo toad, California red-legged frog (*Rana draytonii*), mountain yellow-legged frog (*Rana muscosa*), and Coachella Valley fringe-toed lizard (*Uma inornata*) throughout their ranges.

PROJECT EXPERIENCE

Development

Tejon Mountain Village, Tejon Mountain Village LLC, Kern County, California. Lead biologist and phase manager for wildlife corridor, ringtail cat (*Bassariscus astutus*), sensitive reptile and amphibian, and small mammal studies. Designed and implemented study design for wildlife corridor and ringtail cat studies.

EDUCATION

Humboldt State University
BS, Wildlife Biology and Management, 1991

CERTIFICATIONS

USFWS Federal 10a Survey Permit No. TE-813545-5 (exp. 03/15/2016):

- California gnatcatcher surveys
- Least Bell's vireo surveys/nest monitoring
- Southwestern willow flycatcher surveys
- Quino checkerspot butterfly surveys
- Fairy shrimp surveys

Mohave Ground Squirrel Chief
Survey Permit

PROFESSIONAL AFFILIATIONS

American Ornithologists' Union
Association of Field Ornithologists
Cooper Ornithological Society
Wilson Ornithological Society
The Wildlife Society

PROFESSIONAL REPRESENTATION

Board member of the Southern
California Chapter of The Wildlife Society

ATTACHMENT A (Continued)

For the wildlife corridor study, reviewed 20 crossing locations under and in the vicinity of Interstate 5 along a 10-mile stretch of highway; directed review and analysis of over 16,000 camera station photographs from undercrossings; directed game trail field work; directed implementation of a project-wide geographic information systems (GIS)-based permeability modeling effort to determine preferred wildlife usage and movement across the site and estimate post-project wildlife usage and movement across the site.

For the ringtail cat study, designed, sited, and directed implementation of a baited-station camera study that used a rotating group of 20 digital infrared/motion-sensing game cameras to determine the presence/absence of ringtail cat. Over 200 stations were run across the project area for a period of 16 days each. These camera stations were successful at capturing a variety of large, medium, and small mammals, along with a variety of avian species. Performed habitat assessments for sensitive amphibian and reptile species. Was responsible for designing and implementing both studies. Performed as a project biologist for this project, conducting focused surveys for arroyo toad, California red-legged frog, southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), yellow-billed cuckoo (*Coccyzus americanus*), sensitive butterflies, raptors, and general wildlife.

Master-Planned Community, Santa Barbara County, California. Supervisory biologist for environmental surveys. Conducted initial habitat assessments for vernal pools and special-status wildlife species, including California red-legged frog and tiger salamander (*Ambystoma tigrinum*). Developed strategy for conducting vegetation mapping, jurisdictional wetland delineation, and focused surveys for special-status plants and animals on approximately 4,000 acres of land. The master-planned community project consists of a large development with several thousand homes with associated schools, professional offices, shopping areas, and safety facilities. Dudek is assisting with multiple environmental planning services to prepare an environmentally sensitive development.

Landmark Village Project, Newhall Land and Farming Company, Los Angeles County, California. Supervisory biologist for habitat assessments and focused surveys in 2007 for California gnatcatcher (*Polioptila californica*) and vernal pool surveys on 145 acres of land. Assisted in study design, focused surveys, and analysis.

Mission Village Project, Newhall Land and Farming Company, Los Angeles County, California. Supervisory biologist for habitat assessments and focused surveys in 2007 for vernal pool species and California gnatcatcher on 520 acres of land. Assisted in study design, focused surveys, and analysis.

ATTACHMENT A (Continued)

High Country Project, Newhall Land and Farming Company, Los Angeles and Ventura Counties, California. Lead biologist for habitat assessments and focused wildlife surveys in 2005 for vernal pool species, large mammal usage, California gnatcatcher, southwestern pond turtle (*Actinemys marmorata*), arroyo toad, owls, and special-status birds and reptiles on 23,000 acres of land. Determined species survey methods and biologist coverage areas, and performed analysis on the data collected.

4S Kelwood/4S Ranch, Newland Communities, San Diego County, California. Served as primary wildlife biologist for this project. Conducted habitat assessments and surveys for least Bell's vireo, California gnatcatcher, clapper rail (*Rallus longirostris*), southwestern pond turtle, and Quino checkerspot butterfly (*Euphydryas editha quino*). In addition, conducted a wildlife movement analysis across the property and monitored construction and removal of vegetation.

Trabuco Canyon, The Planning Center, Orange County, California. Lead wildlife biologist for preparation of biological technical reports for California Environmental Quality Act (CEQA) documentation for the Trabuco Canyon Project, which encompasses over 1,110 acres. Managing and conducting a 2.5-year wildlife corridor study program, focused surveys for least Bell's vireo and southwestern willow flycatcher, focused surveys for arroyo toad, habitat assessments and focused surveys for burrowing owl (*Athene cunicularia*), focused California gnatcatcher surveys, nesting raptor surveys, California red-legged frog surveys, and fairy shrimp surveys.

Retrofit Project, Palm Springs Aerial Tramway, Riverside County, California. Managed the biological resources portion of this project, which proposed to install new larger trams. The new tram cars required rock and tree removal adjacent to the tram alignment to ensure safe usage. Initial tasks included conducting focused surveys for mountain yellow-legged frog and golden eagle (*Aquila chrysaetos*), vegetation mapping, reporting, and coordination with the resource agencies. Was later responsible for determining the best way to convey peninsular bighorn sheep (*Ovis canadensis cremnobates*) across the Tram Road and onto the adjacent alluvial fan. This required interviewing numerous state, federal, academic, and field bighorn sheep biologists, devising alternative methods to avoid impacts to sheep, determining likely sheep crossing points, determining potential habitat bridge locations, and submitting a synopsis report.

Yokohl Ranch, Yokohl Ranch LLC, Tulare County, California. Served as a lead wildlife biologist for the project to perform initial habitat assessments for pond turtles, ringtail cats, wildlife movement, and mammals. Dudek is preparing biological resources reports and an environmental impact report (EIR) for an approximately 4,800-acre site that will be developed within the 36,000-acre Yokohl Ranch located in Tulare County. The planned development area lies within valley, foothill, and Sierra Nevada mountain habitats.

ATTACHMENT A (Continued)

Energy

Hazard Tree Removal Project, Southern California Edison (SCE), San Bernardino and San Jacinto Mountains, Riverside and San Bernardino Counties, California. Project manager responsible for SCE's Hazard Tree Removal Project in the San Bernardino National Forest and surroundings. Responsible for conducting biological surveys along all SCE circuits within the San Bernardino and San Jacinto Mountains prior to removal of bark beetle-infested trees, drought-stressed trees, and other damaged trees from the vicinity of its poles, lines, and other facilities. The project area encompasses 106 square miles, an estimated 62,000 acres of tree removal, 22,000+ power poles, and 538 linear miles of utility lines. Responsibilities include serving as project manager, obtaining weekly survey priorities, devising work schedules, coordinating with SCE personnel and USFS biologists regarding site-specific sensitivities, conducting biological surveys of all lines within San Bernardino National Forest, and writing biological assessments for the USFS.

Pole and Utilities Replacement Project, SCE, Riverside and San Bernardino Counties, California. Served as project manager and primary wildlife biologist. Responsibilities included conducting habitat assessments for sensitive wildlife species at multiple locations in Riverside and San Bernardino counties. These locations range from the Santa Ana Mountains and western valleys of Riverside County to San Jacinto Mountain, Palm Springs, Coachella Valley, the southern slopes of San Bernardino County, San Bernardino Mountains, and Apple Valley region of San Bernardino County.

Daggett Ridge Wind Farm EIR/EIS, AES Wind Generation (Daggett Ridge Wind Farm LLC), San Bernardino, California. Served as the lead biologist for the Daggett Ridge Wind Farm project responsible for coordination with the Bureau of Land Management (BLM) and survey design and reporting. Dudek was contracted by Daggett Ridge Wind Farm LLC, a subsidiary company of AES Wind Generation, to prepare required CEQA and National Environmental Policy Act (NEPA) documentation associated with the proposed Daggett Ridge Wind Farm located on public (BLM) and private land in San Bernardino County, California. Dudek initially worked with the County of San Bernardino (California lead agency) staff and the BLM (federal lead agency) to prepare a project management plan to produce a detailed project task schedule, detailed outline of the draft environmental impact report/environmental impact statement (EIR/EIS), a public outreach plan, and a mechanism for regular project updates. Dudek then prepared a combined Environmental Assessment/Initial Study (EA/IS) to focus the environmental analysis required for the EIR/EIS to critical resource areas.

Desert Renewables Energy Conservation Plan, California Energy Commission, Southern California. Served as a project biologist, providing analysis and coordination with species experts. Dudek was selected by the California Energy Commission and the California Natural Resources Agency (California Department of Fish and Game) to prepare the Natural Community Conservation Plan (NCCP) for the Desert Renewables Energy Conservation Plan (DRECP).

ATTACHMENT A (Continued)

The DRECP was established by Governor Schwarzenegger's Executive Order S-14-08, which identifies targets for increasing California's renewable energy portfolio. The DRECP, when completed, is expected to further these objectives and accelerate the processing of renewable projects in the California desert (Mojave and Colorado deserts), encompassing parts of six counties.

The DRECP is an NCCP that will help provide for effective protection and conservation of desert ecosystems while allowing for the appropriate development of renewable energy projects. It will provide long-term endangered species permit assurances to renewable energy developers and provide a process for conservation funding to implement the DRECP. It will also serve as the basis for one or more habitat conservation plans under the federal Endangered Species Act.

San Diego Gas & Electric Cleveland National Forest Electric Safety and Reliability Project, California Public Utilities Commission, San Diego County, California. Serves as the lead biologist for the project. Responsible for coordination with the USFS, determination of species impacts, study design, and monitor management. Dudek was contracted by the California Public Utilities Commission (CPUC) to prepare environmental documents pursuant to CEQA and NEPA for the San Diego Gas & Electric (SDG&E) Cleveland National Forest Electric Safety and Reliability Project. SDG&E proposed to submit an application to the USFS for a Master Special Use Permit, which combined approximately 70 special-use permits and other approvals for various electric transmission and distribution facilities located throughout the Cleveland National Forest (CNF) into one master permit under one 20-year authorization. The project also proposed activities on non-CNF lands, including private lands that are near the CNF and fall under the jurisdiction of the CPUC and other federal lands not under the jurisdiction of the USFS. For activities on private lands, SDG&E submitted an application for a Permit to Construct in accordance with CPUC General Order 131-D.

The project will also include maintenance, replacement or relocation, and operation of existing, active 69-kilovolt (kV) transmission and 12 kV distribution lines; installation or removal of 12 kV distribution lines; maintenance, relocation, or construction of access roads; and maintenance or widening of existing rights-of-way (ROWs) or acquisition of ROWs. The power lines included in the project traverse CNF land, BLM land, California State Parks land, County of San Diego land, tribal land, and private land holdings.

Mountain View IV Wind Energy EIR/EIS Project, City of Palm Springs/Bureau of Land Management, Riverside, California. Served as lead project biologist for the project. Dudek prepared a joint EIR/EIS for the City of Palm Springs and the BLM. The project consists of two development options for a 1,659-acre site. The first development option consists of 49 1,000-kilowatt (kW) turbines. The second includes 58 850 kW turbines. Both alternatives involve the installation of support facilities, including gravel-surfaced access roads, an electrical substation, and an electrical transmission line to connect the turbines to the substation. The project also included a compatibility analysis with the recently adopted Coachella Valley Multi-Species Conservation Plan.

ATTACHMENT A (Continued)

The project site is within the City of Palm Springs corporate boundaries; however, the western half of the project site is composed of BLM land, and the eastern half is private land under the management of the Coachella Valley Water District (CVWD). Consultation and coordination with both lead agencies (City of Palm Springs and BLM) and CVWD played a vital role in the planning process and ultimate certification of the EIR/EIS. The Final EIR/EIS was ultimately certified and adopted by the lead agencies in December 2008.

Borrego Solar Project Characterization Study, Confidential Client, San Diego, California. Served as lead project biologist for analysis. Dudek was contracted to provide environmental services for the 187-acre Borrego Springs Solar Project in San Diego County, California. Located on former agricultural lands, the project would include an interconnection to a 69 kV Borrego Substation located 1.3 miles away, along Borrego Valley Road.

The characterization study will be used to determine site constraints, affecting schedule and possible delays associated with development and environmental permitting. The study was presented showing methods used to determine site constraints, findings that discuss both engineering and environmental constraints, and a site constraints map using geographic information systems (GIS) mapping.

Solar Siting Studies and As-Needed Extension of Staff Services, Confidential Client, San Diego County, California. Lead project biologist for analysis. A solar developer contracted with Dudek to provide as-needed environmental services to assist in identifying sites for solar energy development throughout Southern California. An interactive process with the solar developer staff, the goal was to ensure that all potential environmental constraints were identified when selecting potential development sites based on siting parameters developed by the solar developer. Dudek's studies targeted identifying sites that met the selection criteria to secure options for solar development.

Solar Farm Initial Site Constraints and Fatal Flaw Analysis, Concentrix Solar Inc., San Diego County, California. Serves as lead project biologist for analysis. Dudek was contracted by Concentrix Solar Inc. to conduct an initial site constraints analysis for a proposed solar renewable energy development within the County of San Diego, near the unincorporated community of Boulevard. In addition to conducting a regulatory/environmental constraints survey for this project, Dudek's environmental scientists provided a comprehensive "fatal-flaw" environmental analysis that will allow Concentrix Solar to better make key decisions about developing other solar energy sites within the County of San Diego. To date, these projects include nearly 1,000 acres in San Diego County and involve a variety of resource issues.

ATTACHMENT A (Continued)

Southern California Edison Demolition of Mohave Generating Station, Destrier Inc., Laughlin, Nevada. Served as project manager and lead biologist for project. Dudek subcontracted to Destrier Inc., of Irvine, California, to assist in the demolition process (i.e., providing quality assurance and technical support) for the demolition of Southern California Edison's (SCE's) Mohave Generating Station, located in Laughlin, Nevada, near the Colorado River. Dudek initially assisted Destrier Inc. in the Demolition Bid Review process, reviewing contractor bids regarding responsiveness, completeness, and technical approach. The review included bid compliance with state, federal, and local permits and regulations related to asbestos abatement, hazardous materials waste transportation and disposal, soil and samplings. Later, Dudek provided biological coordination regarding a variety of federally listed threatened and endangered species and other special-status species issues including desert tortoise (*Gopherus agassizii*), Yuma clapper rail, bald eagle (*Haliaeetus leucocephalus*), golden eagle, burrowing owl, relict leopard frog (*Lithobates onca*), gila monster (*Heloderma suspectum*), razorback sucker (*Xyrauchen texanus*), and bonytail chub (*Gila elegans*). Dudek was requested to provide recommendations to avoid attractive nuisance habitat on site, to identify potential nesting issues related to the structure, and to coordinate with the USFWS regarding listed species – obtaining a Section 10 concurrence letter from the local USFWS office in less than 2 months.

Tule Wind Project As-Needed Environmental Services, Iberdrola Renewables Inc; San Diego County, California. Serves as lead biologist and task manager. Dudek was initially contracted to conduct a habitat assessment for Quino checkerspot butterfly at the Tule project site in McCain Valley, in southeastern San Diego County. According to USFWS guidelines, habitat assessments are required to identify suitable vegetation structure and determine the presence/absence of suitable host and nectar plant species used by the Quino. Areas identified as suitable habitat then required focused surveys, according to USFWS protocol, by Dudek's USFWS-permitted biologists. Dudek conducted Quino surveys within the Cuyapaipe, BLM, and state lands along approximately a 10-mile, 1,000-foot-wide corridor of proposed wind turbines and access roads, as well as two, 10-acre substation sites and a 100-foot-wide corridor for 10 miles in McCain Valley, proposed for overhead transmission lines. The survey results mapped and characterized the vegetation communities using GIS technology, and all suitable Quino habitat was mapped, identified, and described in a project report. The Quino survey work was later expanded to include approximately 400 additional acres located on Rough Acres Ranch north of McCain Road, and an additional 1,000-foot-wide corridor designated as an anticipated "action area" for wind turbine projects.

ATTACHMENT A (Continued)

Tierra del Sol Project Biological Surveys, Invenergy Wind Development LLC, San Diego County, California. Serves as lead biologist and task manager. Dudek was contracted to conduct a biological constraints-level survey of the 150-acre Tierra del Sol parcel located in San Diego County. Vegetation communities were mapped in accordance to Holland nomenclature and County of San Diego requirements. A general inventory of plant and animal species was compiled as well as a determination of potential special-status species that could occur on the site. All data were compiled in GIS digital format and added to a Biological Resources Map. Also, specifically, a Quino checkerspot butterfly survey was conducted on the site, and Dudek biologists assessed the suitability of the site as habitat for this protected species. In general, Dudek's initial work on the project identified potential biological issues before the client submits any applications to proceed on the project to the County of San Diego.

Solar Power at Santee Lakes Recreational Preserve, Padre Dam Municipal Water District, San Diego County, California. Served as lead project biologist. The Padre Dam Municipal Water District (District) used an innovative approach to incorporate solar paneling into their Santee Lakes Recreational Preserve park. The District proposed to construct recreation vehicle (RV) ports over three RV parking areas to support solar paneling.

A feasibility study was conducted that indicated that solar panels would be cost effective through a "Power Purchase Agreement" and would benefit the District, park users, and the surrounding community by providing clean energy to the power grid. Dudek prepared an IS that determined that a negative declaration would be the appropriate environmental document for this project. A key factor of the project was that it would provide the District with renewable, clean energy into the power grid, which would help reduce the District's overall carbon emissions at the preserve. A key issue analyzed and determined to be less than significant was the visual character and light and glare for the neighboring residences from the structures and solar paneling.

Municipal

As-Needed Biological and Cultural Resources Surveys and Monitoring, Department of Parks and Recreation, County of San Diego, California. Served as project manager, providing as-needed consulting services for biological and cultural resources. Services included conducting Phase I cultural resources surveys; baseline biological surveys; habitat, wildlife corridor, and sensitive plant and animal species monitoring; and habitat restoration. Prepared technical reports, developed vegetation management plans, and developed public access plans providing analysis and recommendations for potential multiple-use trails and staging areas. Responsible for oversight, wildlife survey design, and staffing for the following projects:

- Baseline Biodiversity and Cultural Survey for the Pascoe, Helix-Lambron, and Cielo Azul Parcel Additions to the Del Dios Highlands Preserve. This project included preparation of a vegetation management plan for the approximately 313-acre area in Escondido, California.

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- Baseline Biodiversity and Cultural Survey for the Escondido Creek Preserve. This project included preparation of a vegetation management plan for the approximately 346-acre site in the Elfin Forest.
- Baseline Biodiversity and Cultural Survey for the San Luis Rey River Park. This project included preparation of a trails assessment and vegetation management plan for the approximately 460-acre site in the northern San Diego County area.
- Tijuana River Valley Regional Park Habitat Restoration Project. This 33-acre site is located in southern San Diego County.
- Lusardi Creek Perennial Invasive Vegetation Control and Coastal Sage Scrub Seed Imprinting Project. This project included preconstruction surveys for nesting birds. This approximately 2-acre site is located in the San Dieguito River Valley.
- Santa Ysabel West Perennial Invasive Vegetation Control Project. This approximately 0.26-acre area is a mitigation site in eastern San Diego County.
- Baseline Biodiversity and Cultural Survey for the Sycamore South and Hagey Portions of the Sycamore Canyon and Goodan Ranch Preserves. This project included preparation of a vegetation management plan for the entire preserve (2,300 acres) and an access plan. The survey site encompasses approximately 263 acres in the Santee/Poway area. This work is still in progress.
- Baseline Biodiversity and Cultural Survey for the Stoneridge Preserve. This project included preparation of a vegetation management plan and was conducted over an approximately 244-acre area in the South San Diego County area. This work is still in progress.
- Baseline Biodiversity and Cultural Survey for the Potrero/Mason Properties. This project included preparation of a vegetation management plan and access plan. The survey was conducted over an approximately 505-acre area in the Barratt Junction area. This work is still in progress.

Resource Management

LaBorde Canyon Off-Highway Vehicle Park Study, Riverside County, California. Served as the project manager and lead biologist for the 2,600-acre study. Was responsible for scheduling ten biologists and one subconsultant to conduct habitat mapping, sensitive plant surveys, Stephens' kangaroo rat (*Dipodomys stephensi*) and San Bernardino kangaroo rat (*Dipodomys merriami parvus*) habitat assessments and trapping, installation and implementation of 20 reptile trap arrays, raptor nest surveys, and general wildlife surveys.

San Luis Rey Bike Path, City of Oceanside, San Diego County, California. Served as project manager and primary wildlife biologist. This project was located at the western end of the San Luis Rey River, near Interstate 5. Conducted vegetation mapping and focused surveys for California gnatcatcher and a variety of sensitive plant species. Processed environmental studies in support of the City of Oceanside's Mitigated Negative Declaration and wrote the habitat restoration plans for the project.

Annual Gnatcatcher Surveys, Trump National Golf Club, City of Rancho Palos Verdes, California. Conducted gnatcatcher surveys over approximately 100 acres of restored coastal sage scrub and coastal bluff scrub habitat within and surrounding the golf course on the Palos Verdes Peninsula. The goal of the surveys was to determine the breeding status of paired birds, territory number, size and location, breeding success, and cowbird predation in accordance

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with the Ocean Trails Habitat Conservation Plan. Prepared annual monitoring reports that summarized population dynamics and identified threats to gnatcatchers.

Western Riverside County Multiple Species Habitat Conservation Plan (MSCHP), Riverside County Transportation and Land Management Agency, Riverside County, California. Served as one of the primary biologists for the Western Riverside MSHCP. Responsible for writing species accounts and coverage assessments for all of the covered reptiles, amphibians, insects, and crustaceans within the planning area. Also responsible for analyzing various wildlife crossing and corridor issues and determining potential methods for safely conveying wildlife across planned roadways. This involved extensive review of current state-of-the-art wildlife underpasses and overpasses within California, nationally, and globally. This also included visiting various sites, such as the Interstate 80 underpasses east of Sacramento. Also participated in implementation of the MSHCP, reviewing proposed projects for consistency with the MSHCP.

West Coyote Hills Field Closure and Development Project, Chevron USA Production Company and Chevron Pacific Coast Homes, City of Fullerton, Orange County, California. Assisted Chevron in obtaining a federal Section 4(d) permit to allow closure of the approximately 600-acre oil field. This field was home to over 46 pairs of California gnatcatchers. Managed environmental compliance regarding endangered species issues and included regular coordination with the USFWS, CDFG, U.S. Army Corps of Engineers, and California Division of Oil and Gas. Served as long-term 4(d) compliance monitor and coordinator for the field closure. Managed and conducted construction worker training seminars, and provided other training materials to educate workers regarding biological resources. Obtained regulatory agency approval of several project changes, including extension of work seasons and impact variances. Prepared and managed implementation of habitat restoration activities benefiting the California gnatcatcher. Prepared, and regularly coordinated with the regulatory agencies regarding, a federal Section 7 Biological Assessment to be included within the USFWS Biological Opinion regarding development of approximately half of the site. Acceptance of this assessment was reliant upon defensible analysis that through project modifications, project configuration, habitat restoration, and long-term management regimes, no net loss of California gnatcatchers would occur.

Stephens' Kangaroo Rat Habitat and Fire Management Plan, Riverside County Habitat Conservation Agency, Riverside County, California. Project manager responsible for preparing a Stephens' kangaroo rat Habitat and Fire Management Plan for the Riverside County Habitat Conservation Agency reserves in Lake Mathews and Steele Peak. Conducted interviews of habitat managers, species experts, and wildlife agency personnel. Coordinated expected fire behavior modeling for the reserve in order to develop a fire protection strategy and brush management plan. Established a suite of monitoring protocols and measures to track population levels and contributed habitat statistics to use for future management decisions. Conducted

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live-trapping in eleven 90-meter by 90-meter grids that included 49 traps per grid. Established a series of stratified grids across the reserve and field-verified the sites. Tested surrogate burrow count methodologies and sampled vegetation using a modified relevé method.

Baseline Biological Surveys of the Otay Ranch Preserve – Salt Creek and San Ysidro Mountain Parcels, County of San Diego, California. Serving as project manager, staffed the project and attended preserve owner/manager meetings as needed. Provided direction on wildlife survey design and directed staff with regard to survey locations and various wildlife studies, including butterfly surveys, avian point-count stations, herp arrays, game camera locations, and small-mammal trapping, within an approximately 1,350-acre area located in Chula Vista, California.

Environmental Surveys of Simon and Mount Gower Preserves, County of San Diego, California. Served as senior wildlife biologist. Provided direction on wildlife survey design and directed staff with regard to survey locations and various wildlife studies, including avian point-count stations, herp arrays, game camera locations, and small mammal trapping, within the 617-acre Simon Preserve and the 1,522-acre Mount Gower Preserve located in Ramona, California.

Transportation

Stormwater Best Management Practice (BMP) Pilot Study and Statewide Wet Basin Projects, California Department of Transportation (Caltrans), Statewide, California. Served as project manager for this BMP pilot study that began in 1999 to account for potential endangered species issues related to implementation of BMPs in San Diego and Los Angeles counties. Initially evaluated all proposed structures to determine which had the potential to become attractive nuisances to sensitive wildlife species. Potentially sensitive BMPs were then monitored over a 2-year period to determine their true impact on sensitive species. During this timeframe, Worked with Caltrans, project engineers, scientists, regulatory agencies, and local conservation groups to modify maintenance and facility management regimes to avoid impacts to a wide variety of sensitive species. As a result of this project, it was determined that one type of BMP was at greater risk of becoming an attractive nuisance to threatened and endangered species. At Caltrans' request, formulated a project strategy and initiated discussions with the regulatory agencies to determine a strategy to permit installation of the BMPs on a statewide level. It was determined that the best method would be to employ the Safe Harbors Act or possibly pursue a habitat conservation plan under Section 7 or 10 of the Endangered Species Act. Currently studying potential BMP sites throughout the entire state and is in contact with the pertinent regulatory agencies and field offices toward devising an effective permitting strategy.

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Oceanside to Escondido Rail Project, North County Transit District (NCTD), Cities of Oceanside, Vista, San Marcos, and Escondido and County of San Diego, California. Served as the primary wildlife biologist for the project, conducting habitat assessments and focused surveys for California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, and arroyo toad along the entire project alignment. Wrote the least Bell's vireo and brown-headed cowbird (*Molothrus ater*) management plans for the project. Additionally, implemented and managed the brown-headed cowbird trapping program.

Mid-County Parkway, Riverside County Integrated Project, Riverside County, California. Lead biologist responsible for managing and conducting focused sensitive plant, burrowing owl, least Bell's vireo, southwestern willow flycatcher, and fairy shrimp surveys within the Mid-County Parkway study area, which includes a number of alternatives and ranges from approximately 1.7 kilometer (1.1 mile) to 6.5 kilometers (4 miles) in width and is approximately 52 kilometers (32 miles) in length. In addition, was responsible for devising a cost-effective helicopter survey method for potential fairy-shrimp-occupied pools after rain events, reducing potential survey time from days to 3 hours. Was also responsible for siting and design of at least 15 major and minor wildlife undercrossings and 3 wildlife overcrossings to accommodate reserves in western Riverside County.

Rancho Santa Fe Road Widening and Bridge Replacement Project, City of Carlsbad Public Works Department, San Diego County, California. Served as a primary wildlife biologist for the project and conducted focused surveys for California gnatcatcher.

Water/Wastewater

As-Needed Contract, City of San Diego Engineering and Capital Projects Department and Water Utilities Department, San Diego County, California. Completed environmental impact studies for several sewer and storm drain projects under the City of San Diego as-needed contract. Wrote several mitigation monitoring plans and processed documentation for CEQA compliance. Personally managed approximately 8 of the 80 projects.

As-Needed Biological Services 2000–2005, San Diego Metropolitan Wastewater Department, City of San Diego, California. Served as primary biologist. Responsibilities included conducting habitat assessments and focused surveys for arroyo toad, California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, fairy shrimp, and other species.

San Diego Pipeline No. 6, Metropolitan Water District (MWD) of Southern California, Riverside and San Diego Counties, California. The project consisted of a 30-mile-long, 9-foot-diameter water conveyance pipeline. Began work on this project as a project monitor, with responsibilities including conducting habitat assessments for at least 10 federally and state-listed plant and wildlife species, conducting biological studies, coordinating monitoring activities, and

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monitoring site investigations for the early project activities. Transitioned into project manager for the approximately \$1.5-million contract, and was responsible for providing environmental support services to the MWD necessary to support revised environmental documents for the pipeline. All tasks for this contract met aggressive scheduling requirements and were within budget.

Tributary Areas 3 and 8 Environmental Monitoring, U.S. Marine Corps Base Camp Pendleton, San Diego County, California. Served as project manager and primary biologist. Implemented categorical exclusion permit requirements supporting installation of an upgraded sewer system over a portion of the base. This required writing a monitoring and compliance plan; initiating habitat assessments over portions of the system which had the potential to affect least Bell's vireo, California gnatcatcher, and arroyo toad; and monitoring activities on a regular basis in accordance with the monitoring plan.

Non-Potable Water Distribution System, Yucaipa Valley Water District, San Bernardino and Riverside Counties, California. Served as lead biologist for wildlife studies within San Timoteo Canyon. Responsibilities included scheduling personnel and conducting focused surveys for arroyo toad, least Bell's vireo, and southwestern willow flycatcher. Overall, 39 person-days were required to complete these focused surveys along the approximately 7-mile alignment.

As-Needed Contract, Eastern Municipal Water District, Riverside County, California. Served as monitoring biologist and primary biologist. These projects required Stephens' kangaroo rat, Quino checkerspot, and California gnatcatcher surveys and monitoring. These projects were situated throughout western Riverside County.

Multiple Projects, Riverside County Flood Control and Water Conservation District, Riverside County, California. Served as project manager for multiple projects. The projects ranged from multiple-acre detention basins to long and linear conveyance projects. Responsible for conducting biological studies, reporting, mitigation and monitoring plan writing, and wetland permitting. Recently completed two projects that involved widening existing channels in the Salt Creek and Perris Valley areas: 4- and 2-mile-long study areas, respectively. These projects involved conducting biological studies (i.e., vegetation mapping, wetland delineations, and focused surveys for California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, arroyo toad, Quino checkerspot, and sensitive plants), relocating burrowing owls, reporting, and assisting with resource agency permitting as required. Many of the projects required coordination with resource agencies.

ATTACHMENT A (Continued)

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