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June 7, 2024 14815

California Department of Fish and Wildlife
Attention: Melanie Burlaza and Alison Kalinowski
3883 Ruffin Road, San Diego
California 92123

Subject: 2024 Focused Crotch Bumble Bee Survey Report for the Nighthawk Energy Storage Project, San Diego County, California

Dear Ms. Burlaza and Ms. Kalinowski:

This letter report documents the 2024 results of a focused survey conducted by Dudek for Crotch's Bumble Bee (*Bombus crotchii*). This survey was conducted for Nighthawk Energy Storage in both the city of Poway and city of San Diego, San Diego County, California. This report is intended to satisfy reporting requirements for the California Department of Fish and Wildlife (CDFW).

1 Study Area and Existing Conditions

The City of Poway is the lead agency for the Nighthawk Energy Storage Project (project). This project consists of a 300-megawatt battery energy storage system (BESS) that will deliver and receive electric power from the existing San Diego Gas & Electric (SDG&E) Sycamore Canyon Substation. The primary project components would be located on a portion of approximately 82 acres of partially developed land consisting of Assessor Parcel Numbers (APN) 320-031-0300 in the City of Poway, California and improvements associated with a high-voltage underground transmission line (gen-tie line) would be located within the City of San Diego, California (City), and Marine Corps Air Station Miramar (Miramar Marine Corps) (Figure 1, Appendix A).

2 Vegetation Communities

Vegetation communities within the city of San Diego and City of Poway consist of nectar resources within all vegetation communities. All vegetation communities were surveyed within each city jurisdiction including a 50-foot buffer. The following is a description of the vegetation communities within the jurisdictions and site buffers.

Disturbed Habitat (11300)

Disturbed habitat is a land cover type characterized by a predominance of non-native species, often introduced and established through human action. Oberbauer et al. (2008) describes disturbed habitat as areas that have been physically disturbed by previous legal human activity and are no longer recognizable as native or naturalized vegetation associations, but continue to retain a soil substrate. Typically, vegetation, if present, is nearly exclusively composed of non-native plant species, such as ornamentals or ruderal exotic species (i.e., weeds).

Disturbed habitat occurs within the project site and buffer. Disturbed habitat occurs on old roads, within the main site, and within the quarry impact areas. Disturbed areas consist of no vegetation, little vegetation, or non-native invasive plant species. When disturbed habitat does not consist of bare ground, non-native vegetation is dominant. Disturbed habitat is dominated by tocalote (*Centaurea melitensis*) and in some areas African fountain grass (*Cenchrus setaceus/Pennisetum setaceum*). Less commonly occurring within the disturbed habitat are prickly sow-thistle (*Sonchus asper*), short-pod mustard (*Hirschfeldia incana*), and tree tobacco (*Nicotiana glauca*).

Urban/Developed (12000)

According to Oberbauer et al. (2008), urban/developed land represents areas that have been constructed upon or otherwise physically altered to an extent that native vegetation communities are not supported. This land cover type generally consists of semi-permanent structures, homes, parking lots, pavement or hardscape, and landscaped areas that require maintenance and irrigation (e.g., ornamental greenbelts). Typically, this land cover type is unvegetated or has some ornamental vegetation.

Urban developed land occurs within the project site and buffer. Developed lands are the paved roads, the main quarry site, paved turnarounds, buildings, structures, and parking areas.

Urban/Developed Ornamental (12000)

Urban/developed ornamental consists of planted species for landscaping purposes and are many times connected to urban development, paved areas, highways, parking lots, and other built features. Ornamental plantings are considered developed lands. If trees are associated with ornamental plantings, nesting species may have potential to occur.

Ornamental land cover consists of species planted for landscaping purposes and occurs within the project site and buffer. Areas mapped as ornamental are located along many of the slopes near paved roads and highways. The soils are disturbed and previously graded. These areas consist of non-native plantings.

Diegan Coastal Sage Scrub (32500)

Diegan coastal sage scrub is a native vegetation community that, according to Oberbauer et al. (2008), is composed of a variety of soft, low, aromatic shrubs, characteristically dominated by drought-deciduous species—such as California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), and sages (*Salvia* spp.)—with scattered evergreen shrubs, including lemonade sumac (*Rhus integrifolia*) and laurel sumac (*Malosma laurina*). The average height of coastal sage scrub reaches 3 to 4 feet.

Dominant species on the project site and in the buffer include the coastal sage scrub, California sagebrush, deerweed (*Acmispon glaber*), and Menzies' goldenbush (*Isocoma menziesii vernonioides*). Less commonly occurring species include stinkwort (*Dittrichia graveolens*), smooth cat's ear (*Hypochaeris glabra*), and California buckwheat.

Diegan Coastal Sage Scrub: Inland Form (32520)

Diegan coastal sage scrub is a native vegetation community that, according to Oberbauer et al. (2008), is composed of a variety of soft, low, aromatic shrubs, characteristically dominated by drought-deciduous species—such as

California sagebrush, California buckwheat, and sages (*Salvia* spp.)—with scattered evergreen shrubs, including laurel sumac. The average height of coastal sage scrub reaches 3 to 4 feet. Inland form is dominated by white sage (*Salvia apiana*).

Dominant species on the project site and within the buffer include black sage (*Salvia mellifera*). Less commonly occurring species include California sagebrush, California buckwheat, laurel sumac, long stem golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), and Menzie's goldenbush. The majority of these areas have been previously graded or mowed. Graminoids are scattered within the coastal sage scrub community on site within limited areas.

Diegan Coastal Sage Scrub: Baccharis Dominated (32530)

Diegan coastal sage scrub–Baccharis dominated is similar to Diegan coastal sage scrub except that it is dominated by *Baccharis* species (broom baccharis [*B. sarothroides*] and/or coyote brush [*B. pilularis*] (Oberbauer et al. 2008). This community typically occurs on disturbed sites or sites within nutrient-poor soils, and is often found within other forms of Diegan coastal sage scrub and on upper terraces of river valleys. Diegan coastal sage scrub–Baccharis dominated is typically a new colonizer of disturbed areas.

Diegan coastal sage scrub–Baccharis dominated occurs within the buffer. This vegetation community occurs in disturbed areas as a new colonizer. In the buffer, Diegan coastal sage scrub–Baccharis dominated is dominated by broom baccharis. Broom baccharis makes up approximately 85% of the vegetation community. Less commonly occurring species include compact brome (*Bromus madritensis*), deerweed, and California buckwheat.

Diegan Coastal Sage Scrub: Inland Form (32500)

Diegan coastal sage scrub is a native vegetation community that, according to Oberbauer et al. (2008), is composed of a variety of soft, low, aromatic shrubs, characteristically dominated by drought-deciduous species—such as California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), and sages (*Salvia* spp.)—with scattered evergreen shrubs, including lemonadeberry (*Rhus integrifolia*) and laurel sumac. The average height of coastal sage scrub reaches 3 to 4 feet. Diegan coastal sage scrub comprises large portions of the site and is characterized mostly of native species. Dominant species include black sage (*Salvia mellifera*), California sagebrush, California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), spiny redberry (*Rhamnus crocea*), and laurel sumac. Less commonly occurring plant species include lemonadeberry, broom baccharis, long stem golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), fascicled tarweed (*Deinandra fasciculata*) and spreading goldenbush (*Isocoma menziesii* var. *menziesii*). The understory of coastal sage scrub vegetation on-site consists of limited cryptogamic crusts with bryophytes and lichens. The majority of these areas have been previously graded or mowed. Graminoids are scattered within the coastal sage scrub community on site within limited areas.

Southern Mixed Chaparral (37120)

Southern mixed chaparral consists of broad-leaved sclerophyll shrubs that range in height from 5 to 10 feet (1.5 to 3 meters) tall. Areas within southern mixed chaparral consist of patches of bare soils or can form mosaics with other coastal sage scrub communities like Venturan coastal sage scrub or Riversidean sage scrub. Southern mixed chaparral can be divided into subtypes like granitic (37121) or mafic (37122) based on the substrates that are present. Floristic distinctions are unknown. Within San Diego County, southern mixed chaparral is dominated by

lilacs such as Ramona lilac (*Ceanothus tomentosus* var. *olivaceus*), as well as *C. leucodermis* and *C. oliganthus*; other *Ceanothus* spp. generally indicate other chaparral types. Some site factors include the substrate is dry, rocky, and often steep. Southern mixed chaparral is often adjacent to and on moister sites than chamise chaparral (37200). Some characteristic plants in this community include chamise (*Adenostoma fasciculatum*), Eastwood manzanita (*Arctostaphylos glandulosa*), Peninsular manzanita (*Arctostaphylos peninsularis*), white fairy lantern (*Calochortus albus*), woollyleaf ceanothus (*Ceanothus tomentosus olivaceus*), wart stemmed lilac (*Ceanothus verrucosus*), San Diego mountain mahogany (*Cercocarpus minutiflorus*), bush rue (*Cneoridium dumosum*), chocolate lily (*Fritillaria biflora*), toyon (*Heteromeles arbutifolia*), honeysuckle (*Lonicera subspicata*), Nuttall's scrub oak (*Quercus dumosa*), laurel sumac, spiny redberry (*Rhamnus crocea*), sugar bush (*Rhus ovata*), white chaparral currant (*Ribes indecorum*), mission manzanita (*Xylococcus bicolor*), Mojave yucca (*Yucca schidigera*), and chaparral yucca (*Yucca whipplei*).

Areas mapped as southern mixed chaparral are within the buffer and dominated by San Diego mountain mahogany. Less common species include spiny redberry, thick leaved yerba santa (*Eriodictyon crassifolium*), and a mix of graminoid species.

Chamise Chaparral (37200)

Chamise chaparral contains shrubs, overwhelmingly dominated by chamise, from 3 to 10 feet tall, with little cover provided by other species. Mature stands of granitic chamise are densely interwoven and contain few herbaceous species within the understory (Oberbauer et al. 2008). Stump sprouting allows this vegetation to adapt to repeated fires. Chamise chaparral typically occurs on dry slopes and ridges (Holland 1986).

Areas mapped as chamise chaparral contain at least 80%–90% cover of chamise. Ground cover is limited and consists mainly of bare ground with few annual species.

Scrub Oak Chaparral (37900)

Scrub oak chaparral contains a dense, evergreen chaparral up to 20 feet tall, dominated by Nuttall's scrub oak with considerable mountain mahogany (*Cercocarpus betuloides)*. In San Diego County, *Quercus berberidifolia* is often the dominant (over 50% cover) and usually occurs in small patches within a variety of other vegetation communities (Oberbauer et al. 2008). Somewhat more mesic than many chaparrals, and often occurring at slightly higher elevations (to ~ 5,000 feet). These more favorable sites recover from fire more quickly than other chaparrals. Substantial leaf litter accumulates. In San Diego County, this usually on north-facing or otherwise mesic slopes and can occur at various elevations (Oberbauer et al.2008).

Areas mapped as scrub oak chaparral are dominated by Nuttall's scrub oak and San Diego mountain mahogany. On the hillsides where scrub oak chaparral occurs almost a 50% cover of both species occur with minimal ground cover and high-density shrubs. Within the flatter areas especially within the buffer non-native grasses and tocalote are present within the understory.

Non-Native Grassland (42200)

Non-native grassland consists of dense to sparse cover of annual grasses with flowering culms from 0.5 to 3 feet in height (Oberbauer et al. 2008). In San Diego County, the presence of wild oat (*Avena barbata*), bromes (*Bromus*

spp.), stork's bill (*Erodium cicutarium*), and short-pod mustard are common indicators of this community. In some areas, depending on past disturbance and annual rainfall, annual forbs may be the dominant species; however, it is presumed that grasses will dominate (Oberbauer et al. 2008).

Within the project site, non-native grassland occurs in a small area and is disturbed. These areas are small, so they are not ideal ground for foraging raptors. Non-native grassland on site consists of a variety of European bromes, including red brome (*Bromus madritensis*), rip-gut brome (*Bromus diandrus*), and soft chess (*Bromus hordeaceus*). It is also dominated by invasive African fountain grass. Tecolote is also common within the non-native grassland patches. Less common within these non-native grasslands are slender wild oat (*Avena barbara*) and wild oat (*Avena fatua*).

Non-Native Grassland—Broadleaf Dominated (42210)

Non-native grassland—broadleaf dominated consists of dense to sparse cover of non-native invasive broadleaf species (Oberbauer et al. 2008). This designation is used when non-native invasive broad-leafed species make up more than 50% cover of the vegetation community. In San Diego County, the presence of black mustard (*Brassica nigra*) and short pod mustard (*Hirschfeldia incana*) are common indicators of this community. In some areas, depending on past disturbance and annual rainfall, some mustards can be more abundant than others (Oberbauer et al. 2008).

Non-native grassland–broadleaf dominated is disturbed on site and within the buffer, and consists of short pod mustard. On site, the coverage of short pod mustard is high at approximately 75% cover. Overall, this is a disturbed non-native community. Less commonly occurring species include stinkwort with red brome and stork's bill.

Emergent Wetland (52440)

Emergent wetlands are generally persistent wetlands that are dominated by low growing perennial wetland species. Emergent wetlands can be found in channels, seeps, springs, floodplains, margins of lakes or rivers, and various basins such as pools, ponds, meadows, and dune swales. They may be freshwater or alkali wetlands. Associated species include *Carex* species, *Eleocharis* species, *Juncus* species, *Rumex* species, and a variety of others. Emergent wetlands are found throughout San Diego County in areas that are wet (Oberbauer et al.2008).

The emergent wetland occurs within portions of the large basins within the vegetation mapping study area buffer (500 foot). The emergent wetlands onsite are dominated by southern cattail (*Typha domingensis*) and San Diego marsh elder (*Iva hayesiana*) which covers almost 85% of the emergent wetlands. Other more common species include California bulrush (*Schoenoplectus californicus*) and Mexican rush (*Juncus mexicanus*). Less common species found within the emergent wetland include and curly dock (*Rumex crispus*), Spanish false fleabane (*Pulicaria paludosa*) and Leopold's rush (*Juncus acutus* ssp. *leopoldii*).

Coastal and Valley Freshwater Marsh (52410)

Coastal and Valley Freshwater marsh is dominated by perennial, emergent monocots that range from 4 to 5 meters in height. Coastal and Valley Freshwater marsh typically form completely closed canopies. Typically, this habitat is dominated by *Scirpus* species and *Typha* species. This vegetation community lacks significant currents, is typically flooded permanently by freshwater. Saturation is prolonged creating deep peaty soils. Some

characteristic species within this community include *Eleocharis* species, common reed (*Phragmites australis*), *Scirpus* species, and *Typha* species.

Coastal and valley freshwater marsh is present within the buffer within basins. This community is dominated by southern cattails (*Typha domingensis*), and California bulrush (*Schoenoplectus californicus*). These basins consist of almost 100% cover of these species within the buffer.

Southern Riparian Woodland (62500)

Southern riparian woodland is moderate density riparian woodlands that is dominated by small trees or shrubs and has scattered taller riparian trees. Southern riparian woodland occurs within major river systems where flood scour occurs, and within smaller major tributaries. Characteristic species that are typically found in southern riparian woodland include broom baccharis (*Baccharis sarothroides*), western sycamore (*Platanus racemosa*), western cottonwood (*Populus* spp.), willow species (*Salix* spp.), and elderberry species (*Sambucus* spp.) (Oberbauer et al. 2008).

Southern riparian woodland occurs within one small portion of the buffer. Within the buffer, southern riparian woodland occurs within the buffer of Beeler Creek. Southern riparian woodland in this area is dominated by red willow (*Salix laevigata*) outside the buffer. In some areas, only red willow occurs as an over story. Other areas consist of red willow with just a few western cottonwood (*Populus fremontii*) seedlings or Goodding's willow (*Salix gooddingii*). Both western cottonwood and Goodding's willow vary in height and occur near the buffer edge. Red willow also varies in height, but generally makes up the majority of the density of these riparian woodland patches.

Unvegetated Stream Channel (64200)

Non-vegetated floodplain or channel is not recognized by Holland (1986) but is recognized by Oberbauer et al. (2008). According to Oberbauer et al. (2008), non-vegetated floodplain or channel is the sandy, gravelly, or rocky fringe of waterways or flood channels that is unvegetated on a relatively permanent basis. Vegetation may be present but is usually less than 10% total cover and grows on the outer edge of the channel.

Unvegetated stream channels contain less than 5% total vegetation cover on site and occurs only within the buffer west of the quarry road. The unvegetated channels consist of sandy soils and cobble. Unvegetated stream channels are surrounded by coastal sage scrub and disturbed habitat.

Coast Live Oak Woodland (71160)

Coast live oak woodland is dominated by a single evergreen species, coast live oak (*Quercus agrifolia* var. *oxyadenia*), with a canopy height reaching 32.8 to 82.0 feet (10 to 25 meters). The shrub layer is poorly developed, but may include toyon, gooseberry (*Ribes* spp.), or laurel sumac. The herb component is continuous, dominated by a variety of introduced species (Oberbauer et al. 2008).

Areas mapped as coast live oak woodland are in the buffer. The overstory is composed of coast live oak with an understory of red brome, stinkwort, and short-pod mustard. Less common associated species include soft chess and tumbleweed (*Salsola tragus*). On site, oak trees have likely been planted because they are aligned in a perfect row. The oaks and their root masses are within the buffer area.

Eucalyptus Woodland (79100)

Eucalyptus habitats range from single-species thickets with little or no shrubby understory to scattered trees over a well-developed herbaceous shrubby understory. Eucalyptus species can form a dense stand with a closed canopy or an open stand that may be installed as a windbreak or as ornamental plantings. Eucalyptus species produce a large amount of leaf and bark litter. Overstory composition is typically limited to one species of the genus, or mixed stands composed of several eucalyptus species; few native overstory species are present within eucalyptus-planted areas. Some characteristic species of this community include blue gum (*Eucalyptus globulus*) and red gum (*Eucalyptus camaldulensis*) (Oberbauer et al. 2008).

Eucalyptus woodland occurs within the buffer. Eucalyptus woodland is composed of red gum and would be considered an open-canopy stand. This eucalyptus woodland community can be easily observed on aerial photography within the buffer.

3 Crotch Bumble Bee Survey

3.1 Background Information

Crotch's Bumblebee (CBB) is one of several Bumblebee species proposed (Xerces Society for Invertebrate Conservation 2018) for listing as an Endangered species under the under California's Endangered Species Act. Crotch's Bumblebee is generally distributed through wildlands and rural areas in low to middle elevations (sea level to at least 6000 feet) of California and exploits a wide range of habitats including native and exotic grasslands, coastal marshes, scrub lands, chaparral, oak-juniper woodlands, pinon woodlands, and desert transition vegetation (on western margins of the Mojave and Colorado deserts). The range and overall abundance of the CBB is believed to have declined substantially over the last two decades (Hatfield et al. 2015, The Xerces Society for Invertebrate Conservation et al. 2018) due to habitat loss from urban and agricultural expansion, as well as the effects of herbicides (Motta et al. 2018) and insecticides (Whitehorn et al. 2012, Muth, F. and A. S. Leonard. 2019) in agricultural settings, especially in California's central valley.

Over recent centuries, competition for floral resources (as well as associated exotic diseases) from the introduced European honeybee (Apis mellifera) has likely led to a decline of many bumblebee species (and many other bees) across the western hemisphere. Like most bumblebees, CBB nest in cavities in the soil, often abandoned rodent burrows, and the adults (queens, workers, and males), active in the daytime, all visit nectar and pollen resources. The CBB utilize a diverse range of floral resources including those among Asclepidaceae, Asteraceae, Boraginaceae, Brasicaceae, Ericaceae, Fabaceae, Hydrophyllaceae, Lamiaceae, Orobanchaceae, Plumbaginaceae, Polygonaceae, Scrophulariaceae, and Solanaceae; and exhibit clear contextual preferences associated with flower species availability on any given time and location. Typically, Asclepias, Salvia, Astragalus, Acmispon, and Vicia are among much preferred flowers. Bumblebees commonly utilizing floral resources 0.2 to 0.3 km from their nests, forage more than 2 km from their nests (Osborne et al. 1999, Keyer et al., 2004). This vagility allows the bumblebees to utilize disconnected patches of suitable forage resources on such a landscape scale that populations may exist on habitat patches within a matrix of urban developed areas.

The extent and proximity of undeveloped lands with wildland conditions in relation to a given site, even if the site be embedded within an urban matrix, influences the likelihood of occupancy, with larger extents and closer

proximities of wildlands associated with higher bumblebee diversity (McFrederick and LeBuhn 2006). Mated gynes (future founding queens) overwinter in soil cavities (Xerces 2023; CDFW 2023), emerge in the early spring to begin new colonies, provisioning their young with pollen and nectar.

As the spring season progresses, workers (small female non-reproductive bees) are produced with increasing numbers and escalate the provisioning of the colony, which continues to grow until in 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 CBB 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).

3.2 Methods – Habitat Assessment and Bumble Bee Surveys

Prior to the focused surveys, Dudek biologists conducted a habitat assessment within the study area to identify suitable habitat and exclude unsuitable habitat both in the field and as a desktop analysis. Based upon nectar resources occurring in all vegetation communities, the entire site was surveyed within the city of Poway and the city of San Diego. The first two surveys for Crotch's bumble bee included photo-only surveys with no handling of individual bumble bees and were conducted in accordance with the CDFW Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species document that was issued June 6, 2023 (CDFW 2023) and would follow the methods below. The third survey was both a photo survey and collection study under the CDFW permit of Callie Amoaku.

Dudek conducted three evenly spaced protocol level surveys for Crotch bumble bee (*Bombus crotchii*) spaced throughout the sampling season (early spring to late summer, as determined by host plant phenology). Visual surveys were conducted from May 9, 2024, May 23, 2024 and June 6, 2024. The surveys were conducted by qualified biologists with expertise in surveying for Crotch bumble bees. Surveys occurred after sunrise and 3 hours before sunset and were not conducted during wet conditions (e.g., foggy, raining, or drizzling) or windy conditions (i.e., sustained winds greater than 8 mph). The surveys were conducted during optimal conditions when there was sunny to partly sunny skies that were greater than 60° Fahrenheit. Suitable floral resource habitat was identified and mapped within the Project area. For each survey pass, each patch of suitable habitat was visually surveyed for 1 person-hour per three acres of the highest quality habitat.

The survey method consisted of determining appropriate nectar/pollen resources. Onsite nectar resources were abundant. Biologists walked wandering transects through these resources with a goal of observing bumble bees in passing and observing bumble bee nest sites associated with small mammal burrow or other appropriate soil cavities. These transects were walked at 1 person-hour per three acres as the protocol requires. Transects were spaced approximately 10 feet apart due to the narrow width of the project site. The first two surveys were undertaken without the capture, netting or collecting of the bumble bees. When a bumble bee was observed, photos were collected of all parts of the bumble bee in order to allow for identification. The final survey included both photo surveys and capture, netting and collecting of bees, chilling and photographing the bees before release (Xerces Society 2023).

Another aspect associated with methods concerns the interpretation of results. As a general rule, we consider an area one half kilometer radius around each CBB finding to constitute occupied habitat. Where several observations are made with a general distribution over and around the study area, all portions of suitable habitat on the project

area deemed occupied or subject to use by CBB. Areas that are paved, developed or maintained with intense agricultural, or exotic nectar resources may be of use to CBB on the margins of native habitat.

Table 1 Schedule of Surveys

Date	Hours	Personnel	Conditions (temperature, cloud cover, wind speed)
05-09-2024	6.29 AM–5.57 PM	Erin Bergman	60-76°F; 0-75 % cloud cover; 0–3 mph wind
05-23-2024	6:16 AM -6:11 PM	Erin Bergman	60-79 °F; 0–100 % cloud cover; 0–4 mph wind
06-06-2024	8:00 AM–2:00 PM	Erin Bergman and Callie Amoaku	67–77°F; 45-100% cloud cover; 0-5 mph wind

3.3 Results – Crotch Bumble Bee Survey

No Crotch bumble bees were observed during the 2024 focused surveys. A total of 2 bumble bee species were observed during the focused surveys. A total of 7 bumble bees were photographed. Two other yellow bumble bees were observed but not photographed.

Bumble Bees Observed On Site during surveys 1-3

Bumble bees onsite included yellow faced bumble bee (*Bombus vosnesenskii*) and yellow bumble bee (*Bombus fervidus).* Bumble bee locations are labeled on figure 2 appendix A with the point locations. Bumble Bee species observed onsite were photographed and are included in appendix B with dates of photographic capture and species identification. Appendix C includes the resume of Erin Bergman.

The information in this survey report and the attached figures and appendices fully and accurately represents the work conducted by the biologists who conducted these focused surveys.

Please feel free to contact Erin Bergman at ebergman@dudek.com if you have any questions regarding the contents of this report.

Sincerely,

Erin Bergman
Biologist

Callie Amoaku
Biologist

Att.: Figures 1-2; Appendices A-C
cc: Callie Amoaku, David Hochart, Candice Magnus

References

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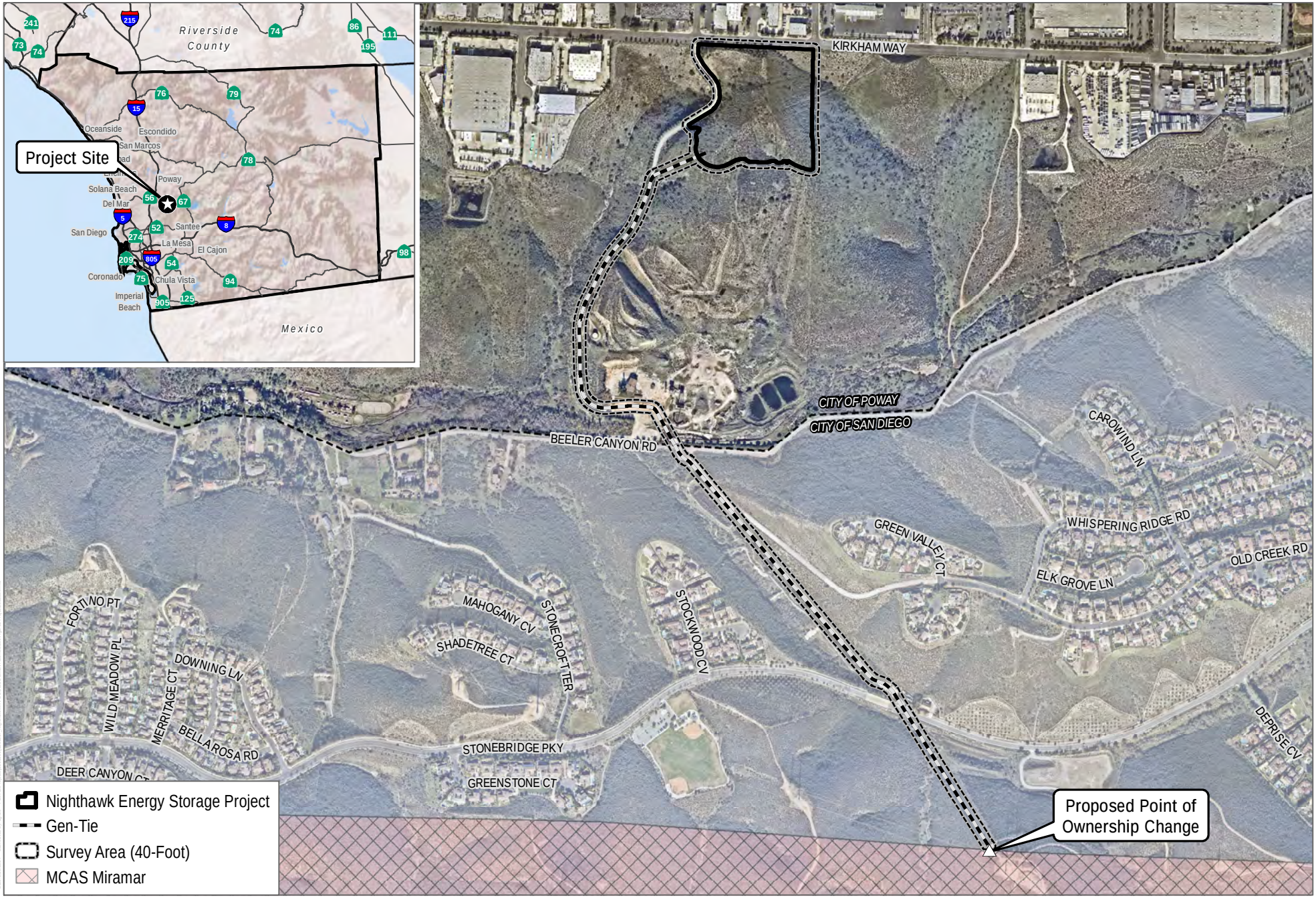
Appendix A
Figures



SOURCE: Power Engineering 2022; Arevon 2023; SANGIS 2020, 2024

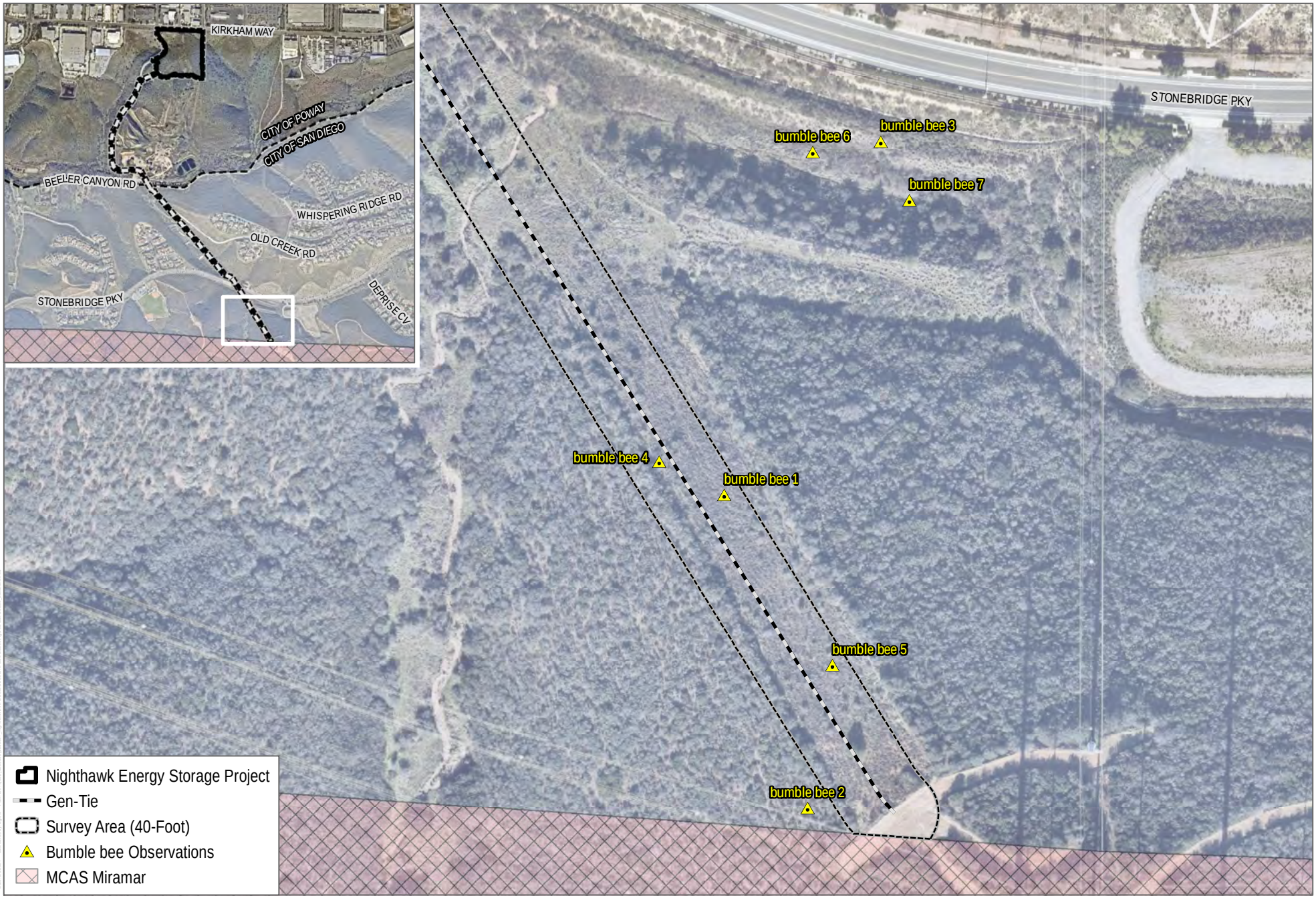
DUDEK

0 500 1,000 Feet

FIGURE 1

Project Location

Nighthawk Energy Storage Project Poway, CA



SOURCE: Power Engineering 2022; Arevon 2023; SANGIS 2020, 2024

DUDEK

0 100 200 Feet

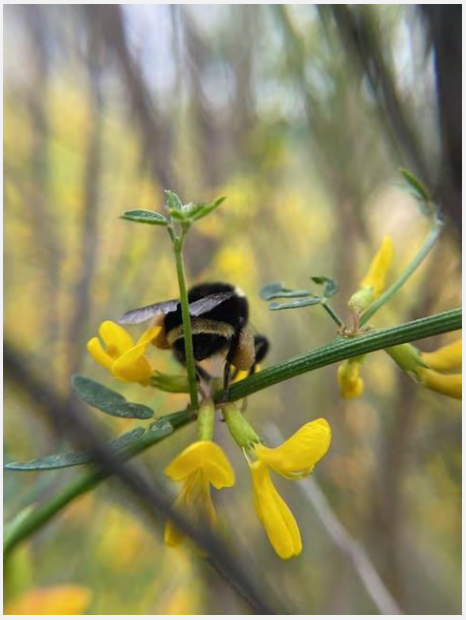
FIGURE 2

Bumble bee Observations

Nighthawk Energy Storage Project Poway, CA

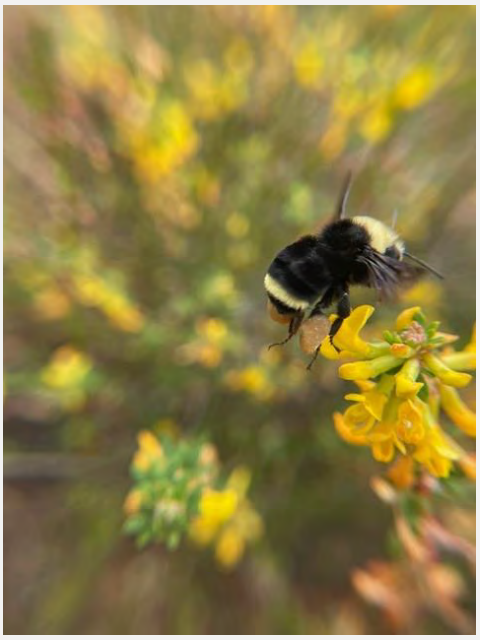
Appendix B
Site Photographs

Yellow faced bumble bee (*Bombus vosnesenskii*) – worker. Photo May 9, 2024, Bumble bee 1



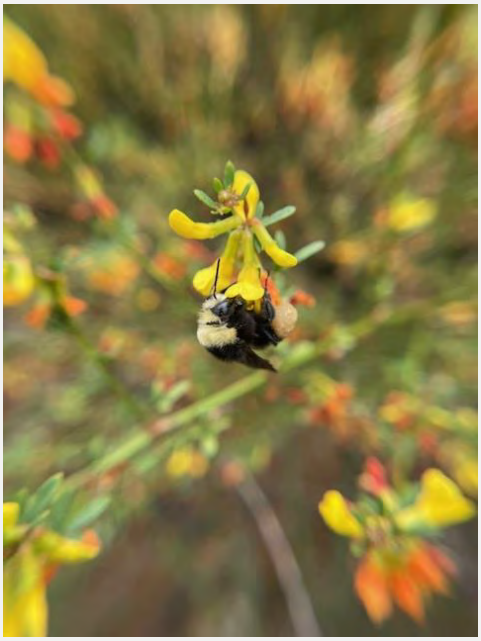
Yellow faced bumble bee – worker. Photo May 9, 2024, Bumble bee 1

Yellow faced bumble bee – worker. Photo May 9, 2024, Bumble bee 1



Yellow faced bumble bee – worker. Photo May 9, 2024, Bumble bee 1

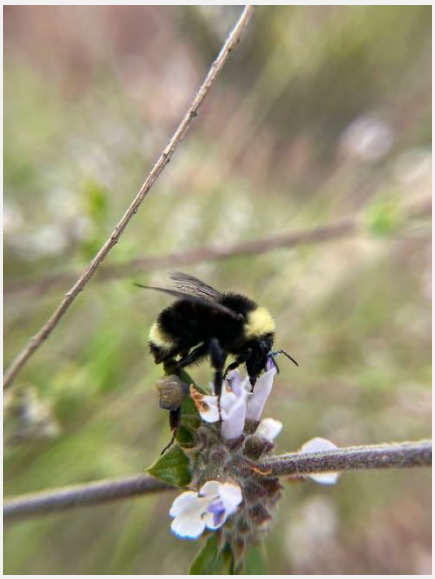
Yellow faced bumble bee – worker. Photo May 9, 2024, Bumble bee 1



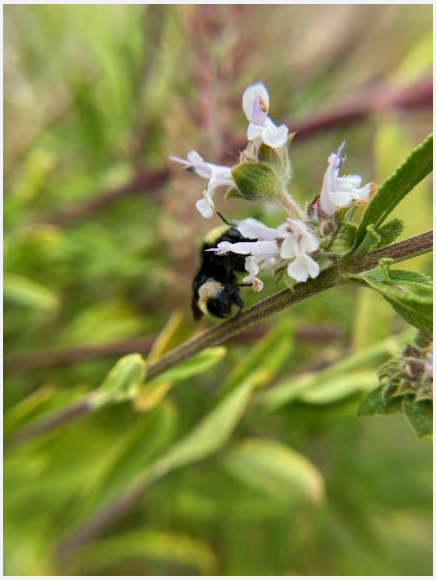
Yellow faced bumble bee – worker. Photo May 9, 2024, Bumble bee 1

Yellow bumble bee (*Bombus fervidus*) – worker. Photo May 9, 2024, Bumble Bee 2

Yellow bumble bee– worker. Photo May 9, 2024, Bumble Bee 2



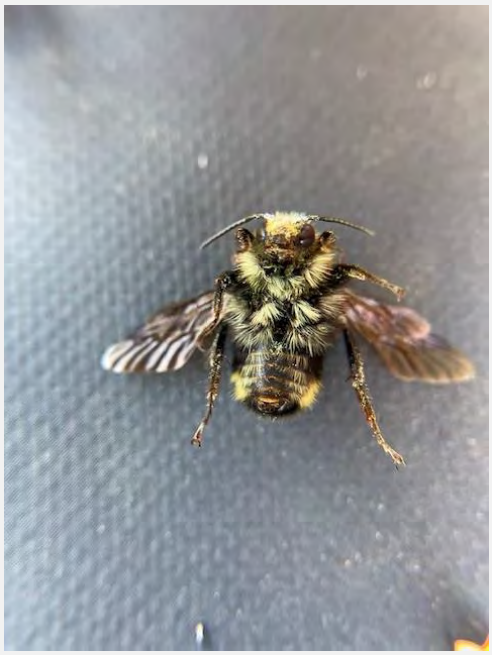
Yellow bumble bee– worker. Photo May 23, 2024, Bumble Bee 3



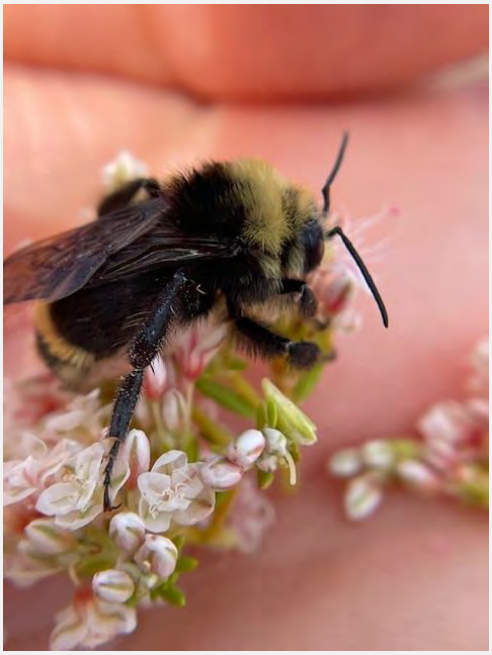
Yellow bumble bee– worker. Photo May 23, 2024, Bumble Bee 3

Yellow bumble bee– worker. Photo May 23, 2024, Bumble Bee 3

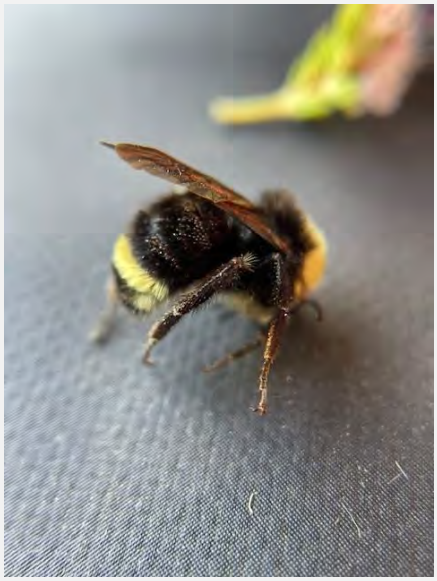
Yellow bumble bee– worker. Photo May 23, 2024, Bumble Bee 3



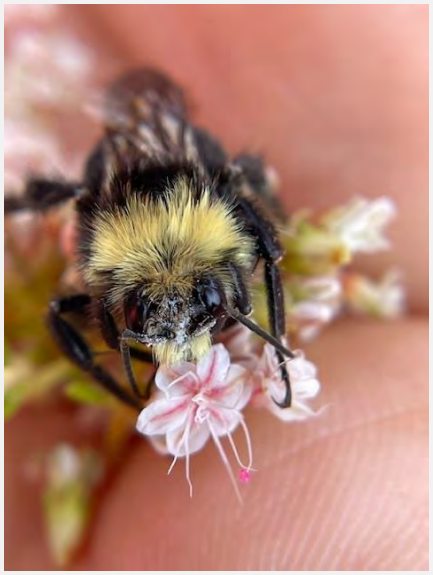
Yellow faced bumble bee – male. Photo June 6, 2024, Bumble Bee 4



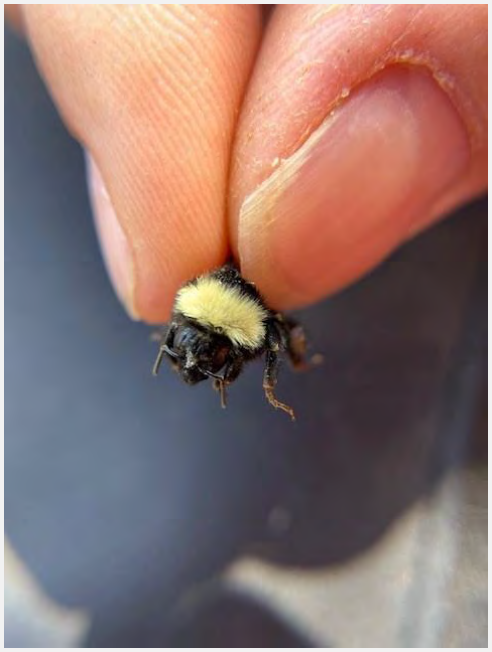
Yellow faced bumble bee – male. Photo June 6, 2024, Bumble Bee 4



Yellow faced bumble bee – male. Photo June 6, 2024, Bumble Bee 4

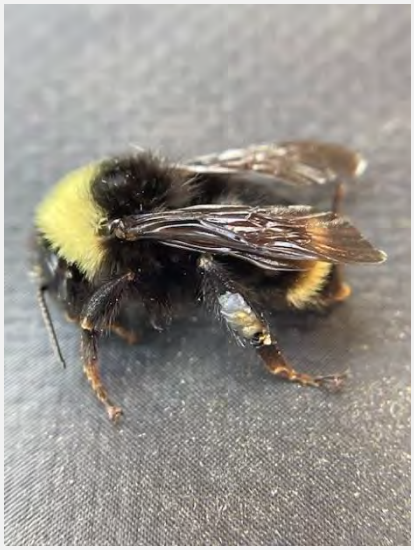


Yellow faced bumble bee – male. Photo June 6, 2024, Bumble Bee 4

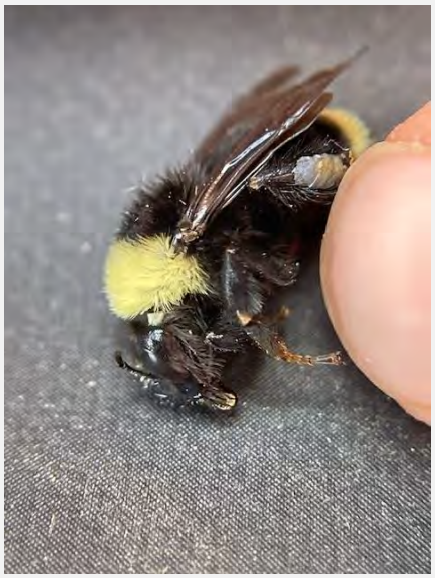


Yellow bumble bee– worker. Photo June 6, 2024, Bumble Bee 5

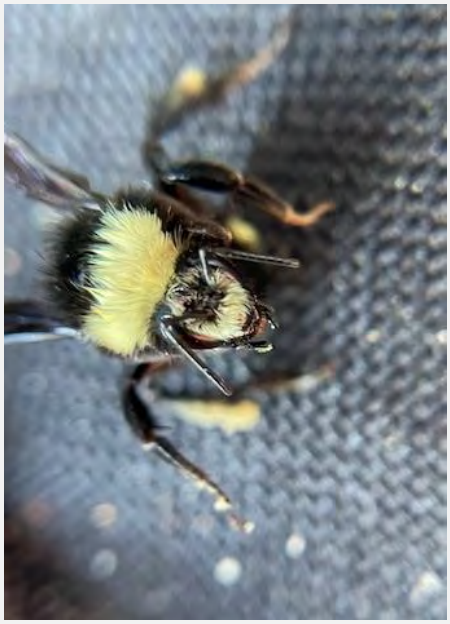
Yellow bumble bee– worker. Photo June 6, 2024, Bumble Bee 5



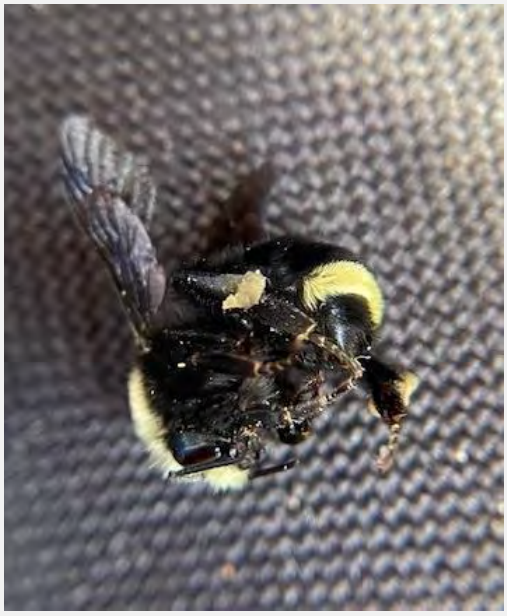
Yellow bumble bee– worker. Photo June 6, 2024, Bumble Bee 5



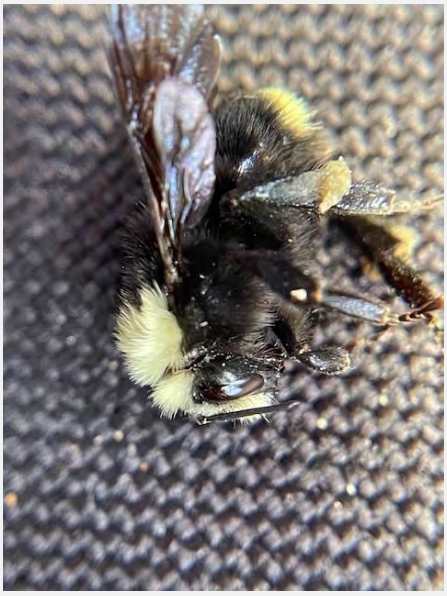
Yellow bumble bee– worker. Photo June 6, 2024, Bumble Bee 5



Yellow faced bumble bee – worker. Photo June 6, 2024, Bumble Bee 6



Yellow faced bumble bee – worker. Photo June 6, 2024, Bumble Bee 6

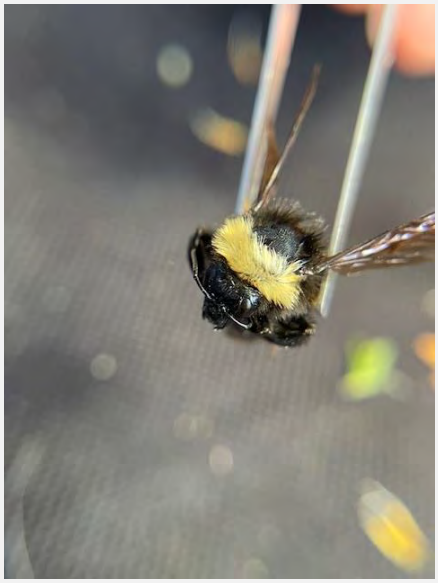


Yellow faced bumble bee – worker. Photo June 6, 2024, Bumble Bee 6

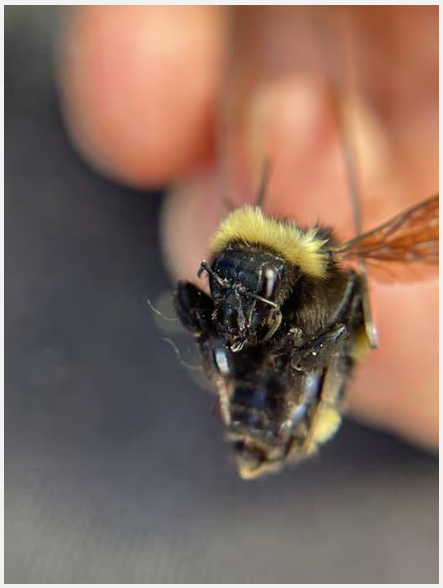
Yellow faced bumble bee – worker. Photo June 6, 2024, Bumble Bee 6

Yellow bumble bee– worker. Photo June 6, 2024, Bumble Bee 7

Yellow bumble bee– worker. Photo June 6, 2024, Bumble Bee 7



Yellow bumble bee– worker. Photo June 6, 2024, Bumble Bee 7



Yellow bumble bee– worker. Photo June 6, 2024, Bumble Bee 7

Appendix C

Erin Bergman Resume

Erin Bergman

BIOLOGIST/CERTIFIED ARBORIST

Erin Bergman has 20 years' experience in biological research and ecology. She has worked in a several communities, including the Pacific Northwest, Puerto Rico, the Midwest, Arizona, Nevada, and throughout California. She currently works as a biologist performing a variety of services including vegetation mapping (Keeler-Wolf Vegetation Classification System/Holland) and weed mapping/monitoring, wetland monitoring (including the California Rapid Assessment Method (CRAM)), general rare plant surveys for the military, solar projects and wind projects. Ms. Bergman conducts monitoring of vernal pools, completes bird surveys, and studies rangeland ecosystems while monitoring grazing.

She works on focused rare desert plant surveys, restoration efforts (focused mainly in riparian habitats, vernal pool communities, southern mountains regions, and both the Sonoran and Mojave desert) and specializes in biological monitoring on construction-related projects. She also manages field efforts related to Quino checkerspot butterfly (*Euphydryas editha quino*), burrowing owl (*Athene cunicularia*), California vernal pool branchiopod, and California gnatcatcher (*Polioptila californica*) surveys and field wetland delineations. Ms. Bergman also focuses research and consulting in agricultural sciences where she is working with agricultural leases' to select farms and farming practices best suited to promote water quality, water use, and natural resource planning.

Ms. Bergman has experience working with a variety of clients, including San Diego Gas and Electric (SDG&E), City of Laguna Niguel, Marine Corps Base (MCB) Camp Pendleton, Marine Corps Air Station Miramar, State and County Parks, San Diego Association of Governments (SANDAG), California Department of Transportation (Caltrans), and confidential solar and wind clients. She has experience with the California Environmental Quality Act and National Environmental Policy Acts (CEQA/NEPA) and writing sections of the following reports: environmental impact report (EIR), environmental assessment, biological technical report (BTR), natural environment study (NES), pre-activity study report, biological resources report (BRR), and biological assessment. Ms. Bergman writes 10(a) reports, restoration reports, monitoring memos, works on data collection, data analysis, and data management.

Education

San Diego State University
MS, Biology/Ecology, 2009

Portland State University
BS, Organismal Biology, 2007

Certifications

CRAM Practitioner South Coast - Estuarine Module, Vernal Pool Systems, and Riverine Systems

Authorization to Collect Voucher, State-Listed Endangered and Threatened Plants Permit
No. 2081 (a)-11-35-V-2011

U.S. Fish and Wildlife Service Recovery
Permit No. TE53771B-2

- *Bay checkerspot butterfly*
- *Casey's June beetle*
- *California gnatcatcher*
- *El Segundo blue butterfly*
- *Flat-tailed horned lizard (Relocation of Species Permit)*
- *Mission blue butterfly*
- *Quino checkerspot butterfly*
- *Vernal pool branchiopods*

Certified Arborist
No. 201–WE 9349A

Professional Affiliations

Association for Tropical Biology and Conservation

American Association for the Advancement of Science

California Native Plant Society

San Diego Farm Bureau

Project Experience

Development

Otay Ranch Village Four Development Project EIR and CEQA Compliance, Otay Valley Quarry, LLC, Chula Vista, California. Serving as a field biologist conducting field surveys for butterfly species, rare plants, and host plants for the Quino checkerspot butterfly for a proposed residential development project. Additional biological monitoring and surveying tasks include jurisdictional delineation, focused wildlife surveys, and preparation of a biological resources report.

As-Needed Environmental Planning Support, City of San Diego, California. Served as senior biologist for a variety of as-needed City of San Diego projects. Conducted vegetation mapping, jurisdictional delineations, wildlife surveys, habitat monitoring, and construction monitoring. Prepared biology reports in accordance with the City's Biology Guidelines.

As-Needed Environmental Planning Services, City of Carlsbad, California. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

2019 Environmental Services Master Services Agreement, San Diego County Water Authority, California. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

Habitat Management Tasks, Habitat Restoration Services, Inc., Chula Vista, California. Served as senior botanist leading the botanical survey effort within Chula Vist, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Munz's sage (*Salvia munzii*), San Diego bursage (*Ambrosia chenopodifolia*), small-leafed rose (*Rosa minutifolia*), wart-stem ceanothus (*Ceanothus verrucosus*), California boxthorn (*Lycium californicum*), Otay tarplant (*Deinandra conjugens*), golden-spined cereus (*Bergerocactus emoryi*), variegated Dudleya (*Dudleya variegata*), San Diego thorn mint (*Acanthomintha ilicifolia*), San Diego goldenstar (*Bloomeria clevelandii*), Palmer's grapplinghook (*Harpagonella palmeri*), and San Diego ambrosia (*Ambrosia pumila*). Performed field surveys with the botanical team and contributed to the biological technical report's botanical sections. Also served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

Moreno Valley World Logistics Center Specific Plan Implementation of Mitigation Monitoring and Reporting Program and Entitlement Support, Highland Fairvew Operating Company, Moreno Valley, California. Served as senior botanist leading the botanical survey effort within Moreno Valley, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museu Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and Calflora. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, San Diego ambrosia, Coulter's saltbush (*Atriplex coulteri*), smooth tarplant (*Centromadia pungens ssp. laevis*), knotweed spineflower (*Chorizanthe polygonoides var. longispina*), and Coulter's goldfields (*Lastehnia glabrata ssp. coulteri*). Performed field surveys with the botanical team and contributed to the biological technical report's botanical sections.

Lennar Salt Creek, Lennar Homes of California, Inc., Chula Vista, California. Served as senior botanist leading the botanical survey effort within Chula Vista, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and the San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Munz's sage, San Diego bursage, small-leafed rose, wart-stem ceanothus, California boxthorn, Otay tarplant, golden-spined cereus, variegated Dudleya, San Diego thorn mint, San Diego goldenstar, Palmer's grapplinghook, and San Diego ambrosia. Performed field surveys with the botanical team and contributed to the biological technical report's botanical sections.

Pepper Tree Park Villages 7 and 8, Justus Wallace Peppertree Park Villages 7 & 8 LLC, Fallbrook, California. Served as senior botanist leading the botanical survey effort within Fallbrook, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and Calflora. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Fish's milkwort (*Polygata cornuta var. fishiae*), white rabbit tobacco (*Pseudognaphalium leucocephalum*), variegated Dudleya, San Diego thorn mint, San Diego goldenstar, Palmer's grapplinghook, and San Diego ambrosia. Performed field surveys with the botanical team and contributed to the biological technical report's botanical sections.

Energy

Confidential Battery Energy Storage System, Confidential Client, Menifee, California. Served as senior biologist conducting a constraints study, including vegetation mapping, an analysis for the potential for rare plants, jurisdictional delineation, and a wildlife study. Wrote a constraints report for this battery storage project.

Buttonbush Solar Energy Project Land Use Entitlement and Environmental Services, 29SC 8me LLC, Bakersfield, California. Served as senior biologist conducting jurisdictional delineation for property mostly dominated by farmlands. Conducted vegetation mapping for the project site.

Nelson Sloan Quarry Restoration, California Department of Parks and Recreation, San Diego, California. Served as lead biologist. Organized field crews of independent butterfly biologists to conduct surveys in areas throughout the Nelson Sloan site. Conducted Quino checkerspot butterfly surveys and recorded host-plant populations. Host plants found in the western part of San Diego County included dot-seed plantain (*Plantago erecta*).

Nelson Sloan Quarry Restoration, California Department of Parks and Recreation, San Diego, California. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

Nelson Sloan Quarry Restoration, California Department of Parks and Recreation, San Diego, California. Served as senior botanist leading the botanical survey effort within San Diego, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Orcutt's bird's-beak (*Dicranostegia orcuttiana*), sea dahlia (*Leptosyne maritima*), California birdbush (*Ornithostaphylos oppositifolia*), cliff spurge (*Euphorbia misera*), star phacelia (*Phacelia stellaris*), cottonheads (*Nemacaulis denudate*), Munz's sage, San Diego bursage, small-leafed rose, wart-stem ceanothus, California boxthorn, Otay tarplant, golden-spined cereus, variegated Dudleya,

San Diego thorn mint, San Diego goldenstar, Palmer's grapplinghook, and San Diego ambrosia. Performed field surveys with the botanical team and contributed to the biological technical report's botanical sections.

Environmental Compliance Services for Otay River Estuary Project (Preconstruction and Post-Construction), Poseidon Resources (Channelside), LP, El Cajon, California. Served as senior botanist leading the botanical survey effort within San Diego County, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, estuary seablite (*Suaeda esteroa*), woolly seablite (*Suaeda taxifolia*), salt marsh bird's beak (*Cordylanthus maritimus ssp. maritimus*), and coast woolly heads (*Nemacaulis denudata. var. denudata*).

Confidential Battery Energy Storage Facility, Confidential Client, San Diego County, California. Served as senior biologist conducting an assessment of mitigation properties. Reviewed mitigation parcel options and conducted vegetation mapping, rare-plant surveys, and wildlife studies to determine the most suitable habitat for client purposes.

Energy Storage Traffic Study and California Energy Commission Application Support, Confidential Client, San Diego County, California. Served as senior botanist leading the botanical survey effort within Chula Vista, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria and Calflora Database. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Allen's daisy (*Pentachaeta aurea ssp. allenii*), San Diego tarplant (*Deinandra paniculate*), Plummer's mariposa lily (*Calochortus plummarae*), and intermediate mariposa lily (*Calochortus weedii var. intermedius*). Performed field surveys with the botanical team and contributed to the biological technical report's botanical sections.

Confidential Battery Energy Storage System, Confidential Client, San Diego County, California. Served as senior botanist leading the coastal California gnatcatcher and burrowing owl survey effort within San Diego County, California. As lead biologist, conducted habitat assessments for both coastal California gnatcatcher and burrowing owl. Conducted protocol surveys for both species and wrote required reports for agencies. Also served as senior botanist leading the botanical survey effort for this project. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Munz's sage, San Diego bursage, Otay mesa mint (*Pogogyne nudiuscula*), small-leafed rose, wart-stem ceanothus, California boxthorn, Otay tarplant, golden-spined cereus, variegated Dudleya, San Diego thorn mint, San Diego goldenstar, Palmer's grapplinghook, and San Diego ambrosia. Performed field surveys with the botanical team and contributed to the biological technical report's botanical sections.

Confidential 3MW EOS Battery Energy Storage Systems Project, Confidential Client, San Diego County, California. Served as senior biologist conducting vegetation mapping, jurisdictional delineation, rare-plant potential analysis, and general bird and wildlife surveys. Wrote a constraints report for the client and the biological technical report.

Nighthawk Energy Storage, AIPE LLC, San Diego and Poway, California. Served as senior biologist leading the botanical field survey effort, jurisdictional delineation, vegetation mapping studies, bird surveys, and coastal California gnatcatcher surveys within San Diego and Poway, California. Studied rare-plant specimens from the

region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and the San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, variegated Dudleya, San Diego thorn mint, San Diego goldenstar, Palmer's grapplinghook, and San Diego ambrosia. Assisted the client in determining the best strategy to avoid biological resources. Wrote the biological technical report for the City of San Diego and Poway per City guidelines.

Environmental Services for Confidential Battery Energy Storage Systems, Confidential Client, San Diego County, California. Served as senior biologist conducting rare-plant surveys, burrowing owl surveys, vegetation mapping, and jurisdictional delineation for a battery storage project site. Completed a constraints report and a jurisdictional delineation report to minimize biological impacts to the project site.

Geranium Battery Energy Storage System, Lotus Infrastructure Partners, San Diego, California. Served as senior biologist. Conducted vegetation mapping, habitat assessment, rare-plant surveys, focused protocol surveys, and host-plant mapping for Quino checkerspot butterfly and Hermes copper butterfly (*Lycaena hermes*). Conducted habitat assessment and protocol surveys for coastal California gnatcatcher, burrowing owl, and least Bell's vireo (*Vireo bellii pusillus*).

Geranium Battery Energy Storage System, Lotus Infrastructure Partners, San Diego, California. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

Geranium Battery Energy Storage System, Lotus Infrastructure Partners, San Diego, California. Served as senior botanist leading the botanical survey effort within San Diego, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Leopold's rush (*Juncus acutus* spp. *Leopodii*), San Diego marsh elder (*Iva hayesiana*), Munz's sage, San Diego bursage, Otay mesa mint, small-leafed rose, wart-stem ceanothus, California boxthorn, Otay tarplant, golden-spined cereus, variegated Dudleya, San Diego thorn mint, San Diego goldenstar, Palmer's grapplinghook, and San Diego ambrosia. Performed field surveys with the botanical team and contributed to the biological technical report's botanical sections.

Electric Vehicle Charging Truck Stop/Auto and Distribution Center Project, EVC Partners LLC, San Bernardino County, California. Served as senior botanist leading the botanical survey effort within the Mojave Desert region near Barstow, California. As the lead botanist, organized all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria and Calflora Database. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Mojave monkeyflower (*Diplacus mohavensis*), Mojave menodora (*Menodora spinescens* var. *mohavensis*), and beaver Indian breadroot (*Pediomelum castoreum*). Performed field surveys with the botanical team and contributed to the biological technical report.

Ivanhoe Ranch, Pv Ivanhoe, LLC, El Cajon, California. Served as senior biologist. Conducted vegetation mapping, habitat assessment, focused protocol surveys, and host-plant mapping for Quino checkerspot butterfly and Hermes copper butterfly; conducted habitat assessment and focused protocol surveys for burrowing owl and least Bell's vireo; and conducted vegetation mapping on potential mitigation parcels. Also conducted wildlife surveys,

habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

Confidential Solar Project, Confidential Client, Jacumba, California. Performed nectar-plant mapping, host-plant mapping, Quino checkerspot butterfly surveys, and bird surveys for an approximately 500-acre site.

Joshua Tree Surveys, Cinco Solar, Mojave, California. Mapped Joshua trees on the ground for a 50-acre solar project. Each Joshua Tree required individual data collection on site for potential removal and relocation. Determined diameter at breast height and recorded factors related to the condition of the Joshua Trees.

General Rare Plant Surveys, Cinco Solar, Mojave, California. Completed rare plant surveys for a 150-acre site and participated in wetland delineation work for this project.

Confidential Solar Project, Boulevard, California. Serving as a biologist and certified arborist assessed oak tree populations to determine their health. A variety of oak trees and scrub oak populations were found on-site. Reviewed morphological characteristics of oak species, disease, pathogens, branch structure, soils, recruitment, and issues regarding oak species related to cattle grazing. Participated in writing the final documents related to oak assessments.

Quino Checkerspot Butterfly Protocol Surveys, Invenergy Wind California, Campo, California. Organized field crews of independent butterfly biologists to conduct surveys in areas throughout the Campo Reservation. As a biologist, conducted Quino checkerspot butterfly surveys with permitted biologists throughout the reservation and recorded host plant populations. Host plants found in the eastern part of San Diego County included Coulter's snapdragon (*Antirrhinum coulterianum*) and Chinese houses (*Collinsia concolor*).

Rare Plant and Vegetation Mapping Protocol Surveys, Invenergy Wind California, Campo, California. Participated in the botany effort during focused rare plant surveys at the Campo Reservation. Rare plants were documented with individual GPS locations and population numbers. Additionally, vegetation communities were recorded as habitat changed.

Quino Checkerspot Butterfly Surveys, Concentrix/Soitec Solar, Boulevard, California. Served as a biologist having a detailed understanding of the Quino checkerspot protocol information published by U.S. Fish and Wildlife Service (USFWS). Organized independent biologists to run surveys for Quino checkerspot, responsible for biology team scheduling and meetings. Provided training on the use of GPS to independent biologists, organized data, collected all data, and downloaded data into a large database for reporting. Performed field surveys, searched for, and recorded Quino checkerspot host plants in Eastern San Diego County, which included blooming specimens of Coulter's snapdragon and Chinese houses. Recorded remnant specimens of short-bracted bird's beak (*Cordylanthus rigidus*). Wrote 45-day reports for USFWS and participated in writing the biological resources report.

Rare Plant Surveys, Confidential Solar Project, Boulevard, California. As botanist, organized botanical field surveys for AECOM and independent botanists. Studied rare plant specimens from Eastern San Diego County at the San Diego Natural History Museum. Performed field surveys for rare plants and assisted in management of rare plant data collection. Also, participated in writing the BRR.

80-Megawatt LAN East Solar and LAN West Solar Project, Rugged Solar, Boulevard, California. Prepared the documentation related to these two separate solar projects.

Palen/Blythe Section 7 Incidental Take Permit, Solar Millennium, Mojave Desert, Blythe, California. As a field biologist, participated in the botany effort during a focused rare plant survey for six special-status plants that had the potential to occur within the impact area of solar energy sites located in the Mojave Desert. More than 2,000 acres of land was surveyed for the target rare plant species, in addition to the 1-mile buffer zone. Vegetation mapping and an inventory of special-status wildlife were conducted with a focus on the desert tortoise.

Natural Communities Conservation Plan (NCCP) Enhancement and Monitoring Project, SDG&E, San Diego County, California. As project biologist, provided field survey and reporting support to SDG&E Land Planning and Natural Resources for habitat enhancement and monitoring associated with impacts as a result of routine operations and maintenance activities associated with electricity transmission and distribution lines within the SDG&E service territory. This project involved identifying temporary impact areas that required enhancement activities per the requirements of SDG&E's Subregional NCCP and monitoring the success of sites that have received habitat enhancement treatments or are recovering through natural recruitment. Specific duties included field surveys for sensitive plants and wildlife, assessing and delineating least-impact access routes and work areas, recommending mitigation measures, and writing project-specific reports.

NCCP Enhancement and Monitoring, SDG&E, San Diego, California. As a biologist monitored work crews to avoid NCCP-listed species including wildlife and plant species. Also monitored ongoing passive restoration at SDG&E work sites.

NCCP On-Call Services, SDG&E, San Diego County, California. As biologist, performed fieldwork and document preparation for on-call support to SDG&E's Land Planning and Natural Resources Department for planned and emergency operations and maintenance activities associated with electricity transmission and distribution lines within San Diego and Orange Counties. This project involved evaluating potential biological impacts from operations and maintenance activities being conducted under SDG&E's Subregional NCCP. A thorough understanding of SDG&E operations and maintenance activities and operational protocols of the NCCP was required. The project consists of ongoing multiple task orders.

Manzanita Crestwood to Boulevard Transmission Line, SDG&E, Boulevard, California. Conducted field surveys for butterfly species, rare plants, and host plants for the Quino checkerspot butterfly along transmission line. Also mapped vegetation communities along transmission line.

Sunrise Powerlink Restoration Services, SDG&E, San Diego County, California. Participated in the field effort to survey all SDG&E tower sites before towers were slated to be constructed. This pre-vegetation survey served as documentation for the restoration efforts following tower construction in temporary impact areas. Individual species were recorded in each temporary impact area. Also performed post-impact surveys to determine the area of impact to each temporary site.

Sunrise Powerlink Restoration Services Seed Collection, SDG&E, San Diego County, California. Participated in the field effort to collect seed from over 100 plant species from mountains west to the desert. Collected seeds from a variety of annuals and perennials.

Military

Growth the Force Environmental Studies, Naval Facilities Engineering Command (NAVFAC) Southwest, Marine Corps Base (MCB) Camp Pendleton, California. As a biologist, performed vegetation mapping and rare plant survey efforts for a base-wide development project and assisted in the preparation of related NEPA documentation.

Button-Celery Survey, NAVFAC Southwest, MCB Camp Pendleton, California. Conducted field surveys for Pendleton button-celery (*Eryngium pendletonense*), a rare endemic plant species. Assisted in the preparation of the final deliverable.

Brodiaea Surveys, NAVFAC Southwest, MCB Camp Pendleton, California. Conducted field surveys for thread-leaved brodiaea (*Brodiaea filifolia*), a rare endemic plant species, and participated in data downloading.

Grow the Force Fairy Shrimp Surveys, NAVFAC Southwest, MCB Camp Pendleton, California. As biologist, participated in fairy shrimp (*Branchinectidae* sp.) surveys throughout the base and assisted in surveying more than 100 pools with fairy shrimp.

Post-Exotic Removal Riparian Habitat Monitoring Plan, NAVFAC Southwest, MCB Camp Pendleton, California. Participated in the implementation of the riparian Habitat Monitoring Plan (HMP) in three rivers on the Camp Pendleton MCB. The HMP assessed the success of a post-exotic species removal program in the 100-year floodplain of the Santa Margarita River, San Mateo Creek, and Las Flores Creek. This included 156 vegetation transects and 36 CRAM assessment areas. Comparison to success standards, recommendations on the exotic removal program, and improvements to the HMP were provided in the HMP. Additional analysis comparing sensitive species data to time since treatment was conducted and included in the HMP as an appendix.

Biological Monitoring of Vernal Pools for SDG&E, MCB, Miramar, California. Performed surveys for vernal pools on the Miramar MCB. She documented each vernal pool and monitored grading on MCB for SDG&E. Monitoring spanned over 4 months. Flagging and monitoring took place during both the wet and dry season.

Biological Monitoring of Nesting Birds, SDG&E, MCB Camp Pendleton, California. Performed monitoring for all road grading that had the potential for California gnatcatcher. This included all areas with coastal sage scrub. Areas with the presence of California gnatcatcher were avoided. Also monitored areas with high levels of erosion for erosion control work.

Biological Monitoring of Arroyo Toad Habitat Sierra Training Area for SDG&E, MCB, Camp Pendleton, California. Worked in habitat with Arroyo toad to have crews avoid areas where habitat was present and take measures to avoid any disturbance activities.

Wire Mountain Gnatcatcher Surveys, MCB, Camp Pendleton, California. Assisted birding specialists with California gnatcatcher surveys near Wire Mountain. Worked in coastal sage scrub and disturbed communities where numerous California gnatcatcher were seen.

Recreation

Professional Expert Services for Lodge v. Barbanell Arbitration, Ray Lodge, Pala, California. Served as senior biologist conducting habitat assessment and a tree study for a water-rights case. Performed as an expert witness on water use and the health of riparian stream and riparian trees. Worked with aerial photography to complete vegetation maps of areas with well use and without well use on the water-rights case.

Chula Vista Entertainment and Sports District, Flat Rock Land Company LLC, Chula Vista, California. Served as senior biologist conducting habitat assessment and protocol surveys for coastal California gnatcatcher. Completed USFWS reporting for the client.

RDM Research and Monitoring Rangeland Study, County of San Diego, Santa Ysabel, California. As a biologist, worked with a certified rangeland specialist conducting visual assessments to determine the impacts and benefits of cattle grazing on the Eastern and Western Santa Ysabel open space preserves. Trained rangers on the

process of collecting RDM samples on the Santa Ysabel Preserve and taught the process of collection, weighing, and calculation. As a result, of the training provided Rangers at the preserve are able to complete all RDM tasks. Also provided recommendations, assisted in the preparation of documents, and completed all documentation related to the 2011 RDM studies.

Hughes Circuits, City of San Marcos, California. Served as senior biologist for the preparation of a project-level EIR for the development of a 67,410-square-foot light industrial building on approximately 2.61 acres of the 10.46-acre site. The remaining approximately 7.85 acres within the project boundary would remain in its current condition. Responsibilities included preparation and review of EIR chapters, review of technical studies, and project coordination with the developer and the City. Also conducted wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies. Additionally, served as the lead botanist for the project, organizing all botanical field surveys and schedules for botanists. Studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, vernal pool pincushion plant (*Navarretia fossalis*), thread-leaved brodiaea, Orcutt's brodiaea (*Brodiaea orcuttii*), San Diego thorn mint, small-flowered morning glory (*Convolvulus simulens*), and San Diego goldenstar. Performed field surveys with the botanical team and contributed to the biological technical report.

Modera Melrose, MCRT Investments LLC, Oceanside, California. Served as senior botanist leading the botanical survey effort within Oceanside, California. As the lead botanist, organized all botanical field surveys and schedules for botanists and studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, thread-leaved brodiaea, Orcutt's brodiaea, San Diego thorn mint, small-flowered morning glory, and San Diego goldenstar. Performed field surveys with the botanical team and contributed to the biological technical report.

Oceanside CEQA Services for Fire Station No. 8, STK Architecture, Oceanside, California. Served as senior biologist leading the wildlife survey effort within Oceanside, California. Conducted habitat assessment for wildlife species and completed a constraints report. Mapped areas of coastal sage scrub habitat and conducted protocol-level surveys for costal California gnatcatcher. Completed required reports for agencies and client. Also served as senior botanist leading the botanical survey effort for the project. As the lead botanist, organized all botanical field surveys and schedules for botanists and studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, vernal pool pincushion plant, California adolphai (*Adolphia californica*), Orcutt's yellow pincushion (*Chaenactis glabruscula var. orcuttiana*), sea dahlia, thread-leaved brodiaea, Orcutt's brodiaea, San Diego thorn mint, small-flowered morning glory, and San Diego goldenstar. Performed field surveys with the botanical team and contributed to the biological technical report.

Fanita Ranch, HomeFed Fanita Rancho LLC, Santee, California. Served as senior biologist conducting habitat assessment and leading a team of biologists in host-plant mapping for Hermes copper butterfly. Conducted protocol-level surveys for Hermes copper butterfly. Also conducted wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

El Monte Valley Nature Park EIR, Endangered Habitats Conservancy, Lakeside, California. This project involves an EIR and associated technical studies for a mineral extraction and 460-acre habitat restoration project within the El Monte River Valley. As biologist, followed crews across the park as they worked to create new trails for park guests and helped to flag native chaparral vegetation requested to be preserved by park management.

Residual Dry Matter (RDM) Grassland Research and Monitoring Rangeland Study, County of San Diego, Ramona, California. As biologist, worked with a certified rangeland specialist to determine what effect the cattle had grazing on the Ramona Grassland Preserve. Collected residual dry matter samples for analysis, provided recommendations, and assisted in the preparation of documents. Managed rangeland management studies, surveys, and documentation tasks and created a monitoring program for newly acquired areas of the Ramona Grassland Preserve. Managed field crews in plant sample collection and wrote all required documents.

Wilderness Gardens Preserve Brodiaea and Thistle Survey, County of San Diego, Pauma Valley, California. Surveyed the county park Wilderness Gardens preserve for both *Brodiaea filifolia* and *Brodiaea terrestris* ssp. *kernensis*. Also surveyed for any weed disturbances that were near potential *Brodiaea terrestris* ssp. *kernensis* populations. Weeds that were assigned to be surveyed for included all *Centaurea* species. *Centaurea melitensis* was observed.

Resource Management

Spring Valley TO-43 San Miguel 2023 Quino Checkerspot Butterfly Surveys, San Diego County Water Authority, Spring Valley, California. Served as senior biologist. Conducted general wildlife surveys, nectar- and host-plant surveys, and protocol-level surveys for Quino checkerspot butterfly.

Salem Christian Homes Assisted Living, Salem Christian Homes, Valley Center, California. Served as senior biologist. Conducted coastal California gnatcatcher habitat assessment, documented coastal sage scrub habitat on site, conducted vegetation mapping, and completed protocol-level surveys for coastal California gnatcatcher. Completed required agency reporting for coastal California gnatcatcher.

Salem Christian Homes Work Order #2, Howes, Weiler, Landy, Valley Center, California. Served as senior biologist. Conducted general and focused biological surveys and habitat delineations for the landowner. Conducted general wildlife surveys, rare-plant surveys, and protocol-level surveys for the California gnatcatcher.

Upland and Vernal Pool Weed Control, City of Carlsbad, California. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

Aquabella Master Project Literature Review and Site Assessment, Highland Fairview Operating Company, Moreno Valley, California. Served as senior biologist conducting a portion of the vernal pool surveys and vernal pool mapping. Conducted fairy shrimp surveys.

Aquabella Project Biological Species Surveys for 2023, Highland Fairview Operating Company, Moreno Valley, California. Served as senior biologist conducting vernal pool mapping of the site.

North River Farms Parcel C Biological Surveys, The NRF Project Owner LLC, Oceanside, California. Served as senior botanist leading the botanical survey effort within Oceanside, California. As the lead botanist, organized all botanical field surveys and schedules for botanists and studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora

Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, sea dahlia, California boxthorn, cliff spurge, Lewis's evening primrose (*Camissoniopsis lewisii*), thread-leaved brodiaea, Orcutt's brodiaea, San Diego thorn mint, small-flowered morning glory, and San Diego goldenstar. Performed field surveys with the botanical team and contributed to the biological technical report.

Vernal Pool Survey and Memorandum, Private Client, Ramona, California. Served as senior biologist. Conducted a reconnaissance site visit, conducted jurisdictional delineation, completed the vegetation map, and reviewed rare-plant potential. Completed a constraints report.

Mission Valley Campus Environmental Permitting, San Diego State University, California. Served as senior biologist conducting coastal California gnatcatcher noise monitoring on site. Utilizing noise monitoring equipment, coastal California gnatcatchers were monitored for signs of distress. Construction crews were required to pause work when levels of noise during the nesting bird season were too high. Also served as senior botanist leading the botanical survey effort for the project. As the lead botanist, organized all botanical field surveys and schedules for botanists and studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, sea dahlia, California boxthorn, cliff spurge, Lewis's evening primrose, thread-leaved brodiaea, Orcutt's brodiaea, San Diego thorn mint, small-flowered morning glory, and San Diego goldenstar. Performed field surveys with the botanical team and contributed to the biological technical report.

As-Needed Watershed and Resource Protection, City of San Diego, California. The City of San Diego Public Utilities Department contracted with Dudek to provide as-needed environmental services for projects related to watersheds, reservoirs, groundwater, and resource protection. Focused work on resource protection and water quality with relation to agricultural systems. She performed an analysis of agricultural types with potential to lease land within the San Pasqual Valley. She reviewed literature on a variety of agricultural types, while creating a rating system to quantify water quality, water use, and resource protection. A farm ranking system was produced for initial farm assessment and continual farm lease management.

City and County of San Francisco (SFPUC and SFCDS) Laguna Honda Reservoir Northern (Franciscan) Coastal Scrub Restoration, San Francisco, California. Completed the field effort for rare plant surveys and vegetation mapping of the Laguna Honda Reservoir. The project involved the restoration of approximately 5-acres of Northern (Franciscan) Coastal Scrub within the Reservoir watershed. The project involves removal of target invasive exotics and revegetation of native scrub habitat. The native scrub habitat revegetation is being accomplished through a combination of exotic removal, native plant volunteer recruitment and active planting and seeding. Compiled baseline assessment of vegetation and prepared restoration report. Monitoring included establishment of native plants, control of nonnative weed species, and general wildlife use of the project area. Success criteria was determined through the collection of annual transect data, analysis, and compare to project success standards using confidence intervals. Conducted a power analysis to increase monitoring efficiency and determined that monitoring effort could be reduced and still achieve 90 percent power. Prepared projects documentation and annual reports.

Rangeland Monitoring Bakersfield Metropolitan Sanitary Landfill (BENA SLF), Bakersfield, California. The BENA SLF consists of 2,285 acres of land, of which 963 acres are reserved for mitigation. Grazing is used within the 963 acres of mitigation lands. Completes rangeland monitoring tasks and reporting (2014–Present).

As-Needed Environmental Services, City of San Diego, California. The City of San Diego contracted with Dudek to provide as-needed environmental planning services to support the City's engineering and capital improvement program (CIP) and ancillary projects. Provided services ensuring planning and permitting activities were in compliance with jurisdictional regulations. She worked on projects related to water and sewer, transportation, storm drains, and restoration activities, and specifically provided compliance reporting (including as-built plan preparation) during maintenance of Murphy Canyon and Sorrento Valley channel maintenance projects. She also worked as a biological and air quality monitor for these projects.

Mesa Mint Grassland Restoration, Back County Land Trust, Alpine, California. Working on grassland restoration specially focusing on mesa mint populations in large grassland expanses of Alpine, California, for the backcountry land trust. Work is focused on field surveys and seed collection.

Railroad Plant Salvage Project, SANDAG, San Ysidro, California. Project consists of salvaging six species of rare plants. As a biologist, led crews in the collection of seed and general plant salvage. Also worked on seed collection throughout the site.

Otay Sweetwater Revegetation Project, SANDAG, Otay, California. Project consists of monitoring the restoration occurring at the Otay Revegetation site. As biologist, monitored the site for weed infestation and marked all weed species with a GPS for removal. Also assisted in photo documentation of the field site.

Dennery Canyon Vernal Pool Restoration Project for D and D Wildlife Habitat Restoration, Otay Mesa, California. Worked on restoration for a 45-acre vernal pool site in Otay Mesa. Worked on plant propagation, rare plant surveys, plant collections, burrowing owl surveys, seed dispersing methods, and butterfly surveys. The success of this project set a new standard for vernal pool restoration in the San Diego area.

Santa Ana River Land Management, Army Corps of Engineers (ACOE) Los Angeles District, Corona, California. Assisted in the initial steps of fieldwork preparation and organization relating to property ownership and designating random points for wildlife surveys and vegetation monitoring.

Dennery West Biological Mitigation, SANDAG, Otay Mesa, California. As a biologist, worked on wildlife surveys. Focused butterfly surveys were conducted with other permitted biologists to determine if the Quino checkerspot butterfly would inhabit the restoration site. Also propagated host plants for the Quino checkerspot. Created vegetation maps of dot-seed plantain and purple owls clover (*Castilleja exserta*) occurring on the site. Managed field crews and report writing for Quino checkerspot monitoring in the second year. Focused on fieldwork related to vegetation transects, California gnatcatcher and Quino checkerspot surveys on the restoration site. Wrote 45-day reports and wrote the wildlife species sections of the report for SANDAG.

Vegetation Classification System Development, SANDAG, San Diego, California. Collected data on plant community compositions, describing the most abundant vegetation at random points throughout the county. In addition, recorded all the vegetation in that local area to tough books (mini computers). A variety of data was collected, ranging from on-site plant species, integrated photos of the community, percent cover of vegetation, slope and aspect, latitude and longitude data, and site notes. Soils were keyed out using a soil key and recorded at each site similar to soils keyed in wetland delineations.

Invasive Nonnative Species Plant Mapping, SANDAG, San Diego, California. SANDAG developed a regional framework and strategy for the management of invasive plants for approximately 1.3 million acres of Western San Diego County. Under a separate contract, SANDAG has tasked a project team of invasive plant experts with developing this plan. Working to create a new database of geospatially linked data to consolidate the attributes of

the existing dataset and add additional fields useful for the management and interpretation of invasive species distribution. Conducted the field effort, which verified the accuracy of the mapping effort. Documented invasive weeds throughout western San Diego County over a 6-month period, mapping all state parks, federal lands, city parks, roadsides, and already-mapped invasive-species locations to create a detailed invasive-plant species map.

Tecate Cypress Mapping, SANDAG, San Diego, California. SANDAG seeks to acquire baseline knowledge of the distribution and status of Tecate cypress within San Diego County. Participated in the mapping effort related to this species.

Borderfield State Park Long-Term Monitoring Project, Audubon Society, San Diego, California. Led biologists and volunteers in bird and vegetation monitoring. Monitoring included transects in a variety of habitats, such as dunes, salt marsh, upland habitats, chaparral, coastal sage scrub, and riparian communities.

Saprophytic Orchid Distribution in Old Growth Rain Forest, National Science Foundation, Rio Grande, Puerto Rico. Researched saprophytic orchids with relation to land use history. Analyzed location and distribution of plant species, managed data with JMP and STATISTICA, ran Excel programs to analyze large distributions, and analyzed leaf litter and soils samples, which resulted in published work.

Chollas Creek Cactus Wren Habitat Restoration, Groundworks San Diego, National City, California. As a biologist, organized and completed the vegetation mapping for this site. Plants that provided habitat for the cactus wren were of particular focus, and nests were recorded. These included cactus that were of older stature with many spines (*Cylindropuntia* sp.). Focused attention on *Rhamnus crocea* species due to its importance as a host plant for the Hermes copper (*Lycaena hermes*) butterfly. All other rare plants were recorded individually, or population size was recorded. The majority of rare plants found at the site were San Diego barrel cactus (*Ferocactus viridescens*) and California adolphia.

Wilderness Gardens Preserve Argentine Ant Survey, County of San Diego, Pauma Valley, California. Ant surveys were done per U.S. Geological Survey protocol to determine ant Species located with *Brodiaea terrestris* ssp. *kernensis*. Baited ants on note card with butter cookies to determine if any non-native ants were observed in sections of the park with meadows.

Transportation

Fenton Parkway Bridge, San Diego State University, California. Served as senior botanist leading the botanical survey effort within San Diego, California. As the lead botanist, organized all botanical field surveys and schedules for botanists and studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria, Calflora Database, and San Diego County Plant Atlas. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, thread-leaved brodiaea, Orcutt's brodiaea, San Diego thorn mint, small-flowered morning glory, variegated Dudleya, seaside calandrinia (*Cistanthe maritima*), white rabbit tobacco, San Diego ambrosia, and San Diego goldenstar. Performed field surveys with the botanical team and contributed to the biological technical report.

30-Acre Site West of Highway 395, CH Reality Partners LLC, Hesperia, California. Served as senior botanist leading the botanical survey effort within Hesperia, California. As the lead botanist, organized all botanical field surveys and schedules for botanists and studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria and Calflora Database. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but

not limited to, Palmer's mariposa lily (*Calochortus palmeri palmeri*), Borrego milk vetch (*Astragalus lentiginosus boregoensis*), pygmy poppy (*Canbya candida*), golden chaetopappa (*Pentachaeta aurea ssp. aurea*), white-bracted spineflower (*Chorizanthe xanti leucotheca*), and Mojave spineflower (chorizanthe spinosa). Performed field surveys with the botanical team and contributed to the biological technical report.

30-Acre Hesperia Project West of 395, Kiss Hesperia Venture LLC, Hesperia, California. Served as senior botanist leading the botanical survey effort within Hesperia, California. As the lead botanist, organized all botanical field surveys and schedules for botanists and studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria and Calflora Database. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, Palmer's mariposa lily, Borrego milk vetch, pygmy poppy, golden chaetopappa, white-bracted spineflower, and Mojave spineflower. Performed field surveys with the botanical team and contributed to the biological technical report.

Otay Ranch Village Eight East CEQA Addendum, HomeFed Otay Land II LLC, Chula Vista, California. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

CEQA Services for Fenton Parkway Bridge, San Diego State University, California. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

Carlsbad Fiscal Year 2021 Roadway Gap Closure on College Blvd Reach A Design, CR Associates, Carlsbad, California. Served as senior biologist conducting a reconnaissance survey, rare-plant analysis, vegetation mapping, and a wildlife study. Completed a constraints report for the client.

Shinohara Lane Biological Services, VMP-OP Shinohara Owner LLC, Chula Vista, California. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies.

Bay Area Toll Authority (BATA) and Caltrans District 4 – Bay Area Bridge Eastern Span Tree Installation, Oakland, California Worked with another certified arborist identifying tree selection, health, and extractions for *Phoenix canariensis* to be placed within the touch down and toll plaza areas of the new Eastern span of the Bay Bridge. Responsibilities included health and hazard assessment inspections of selected palms across the State of California, sampling and testing for pathogens (*Fusarium oxysporum*) and reviewing environmental data.

St. Paul's Cathedral EIR, Caltrans, San Diego, California. This project-level EIR was prepared to evaluate the environmental effects of the proposed St. Paul's Cathedral and Residences project. As a biologist, provided knowledge and identification of ornamental plants from Mediterranean climates that surrounded the project site, ranging from South Africa to Australia.

Escondido Creek Wetland Riparian Flood Avoidance Dredge Expansion Project, San Diego County Water Authority, California. As a certified arborist collected data for over 500 ornamental trees. Documented all the species and recorded the nativity status. Some trees were to be removed prior to dredging activities.

Lonestar Vernal Pool Monitoring, Caltrans, Otay, California. Managed all field work and reporting, conducted field surveys to map and monitor over 130 pools with vernal pool plants. Organized all data related to the project and completed all reports during the wet and dry seasons.

Dennery Canyon Vernal Pool Restoration Project Seed Bulking and Plant Propagation, Caltrans, Otay Mesa, California. Project consists of enhancement and construction of more than 30 vernal pools and adjacent upland habitat for Quino checkerspot butterfly habitat. As biologist, assisted in the collection of seed of several vernal pool plant species, worked on seed bulking of sensitive plant species, and propagated both vernal pool plants and upland plants in the annex.

State Route (SR) 125 South Restoration Site, Caltrans and South Bay Expressway, San Diego, California. As biologist worked on the mitigation for construction of SR-125 to include vernal pool restoration, and Quino checkerspot butterfly and cactus wren (*Campylorhynchus brunneicapillus*) habitat restoration. Provided qualitative and quantitative botanical surveys of vernal pools and Quino checkerspot habitats, and worked on the propagation of rare plants specific to Otay Mesa.

Otay Truck Trail Road Expansion Vegetation Mapping and Biological Surveys, SANDAG and Caltrans, Otay, California. As biologist, worked on a field assessment reviewing rare plants and soils, and wildlife. Organized and completed the vegetation map for the site. Participated in and wrote the NES associated with this project. Organized and completed Quino checkerspot butterfly and western burrowing owl protocol surveys for the project site.

U.S. Route 95 (US-95) Constraints Analysis, Arizona Department of Transportation (ADOT) Yuma, Arizona. As a biologist worked on a field assessment to map out the vegetation communities and constraints analysis for rare plants and wildlife along US-95 in Yuma, Arizona. Directed the rare plant surveys for the project site and wrote sections of the constraints analysis.

Miramar Gnatcatcher Surveys, Caltrans, San Diego, California. Assisted birding specialists with California gnatcatcher surveys and worked in coastal sage scrub where numerous California gnatcatcher were seen.

Culvert Repair Project Gnatcatcher Surveys, Caltrans, Camp Pendleton, California. Assisted birding specialists with California gnatcatcher surveys on coastal bluff scrub and coastal sage scrub habitat while monitoring crews working on culvert repairs.

SR-126 Widening Project Biological Survey and Monitoring, County of Los Angeles-Department of Public Works, Los Angeles, California. Completed rare plant surveys, general wildlife surveys, and vegetation mapping and monitoring for construction at the SR-126 widening site. Specifically worked on racking legless lizard populations and relocating them to a CDFW approved location. Collected over 15 legless lizards for relocation and collected some of the native perennials for mitigation sites.

Interstate 10 (I-10) Jurisdictional Delineation (JD), ADOT, Tucson, Arizona. As biologist, worked on a field assessment mapping washes and drainages across 404 I-10 in Tucson and assisted with the JD.

Water/Wastewater/Agriculture

Sycuan Wastewater Treatment Facility and Utility Corridor Infrastructure Development, Sycuan Band of the Kumeyaay Nation, El Cajon, California. Served as lead biologist conducting Quino checkerspot butterfly protocol surveys and recording host-plant populations. Host plants found in the western part of San Diego County included dot-seed plantain.

Task Order 21 - Crossover Pipeline Realignment Project, San Diego County Water Authority, San Diego, California.. Served as senior biologist conducting wildlife surveys, habitat assessment, vegetation mapping, protocol-level surveys, and mapping of coastal sage scrub habitat for coastal California gnatcatcher. Completed reporting for agencies. Also conducted Quino checkerspot butterfly protocol surveys and recorded host-plant populations. Host plants found in the western part of San Diego County included dot-seed plantain.

Task Order 32 - San Vicente Energy Storage Facility Environmental Surveys, San Diego County Water Authority, San Vincente, California. Served as lead biologist conducting Quino checkerspot butterfly protocol surveys and recording host-plant populations. Host plants found in the western part of San Diego County included dot-seed plantain.

Perris Valley Master Drainage Plan, Line E, Stage 5 and 6 Project, City of Perris, California. Served as senior botanist leading the botanical survey effort within Perris, California. As the lead botanist, organized all botanical field surveys and schedules for botanists and studied rare-plant specimens from the region within the San Diego Natural History Museum. Studied rare-plant locations within the Consortium of Herbaria and Calflora Database. Performed rare-plant reference checks to document bloom status of numerous rare-plant species, including, but not limited to, San Diego tarplant and smooth tarplant. Performed field surveys with the botanical team and contributed to the biological technical report.

San Pasqual Valley Agricultural Assessment, City of San Diego, California. Performed agricultural selection and assessment of over 25 farm types with relation to water quality, water use and natural resource impacts. Created a database for rating agricultural systems for continual farm management and initial farm assessment.

Wetland/Riparian Enhancement Project, San Diego County Water Authority, Escondido, California. As a botanist and restoration ecologist, assisted in the monitoring of 21 acres of wetland/riparian enhancement within a conservation easement established within the 100-year floodplain of Escondido Creek.

Sulphur Creek Restoration Project, City of Laguna Niguel, Laguna Niguel, California. This project was designed to create, restore, and enhance wetland and riparian communities and establish a native sage scrub buffer along a 1.5-mile stretch of Sulphur Creek in the Aliso Creek Watershed. Performed annual vegetation surveys and data collection. Year 1 annual monitoring and baseline data collection were completed in June 2008 for each of the project components (Upper Sulphur Creek and Lower Sulphur Creek). Performed vegetation mapping for the project sites and participated in document preparation.

Lake Wohlford Dam Replacement, City of Escondido, San Diego County, California. As a biologist, participated in the botany field effort, including vegetation mapping and focused rare plant and wildlife species surveys for project site and 500-foot buffer.

Santa Ana River Mainstem Project Habitat Monitoring, Agri-Chemical Supply, Norco, California. As biologist, participated in the botanical effort of monitoring vegetation communities before a large-scale removal of invasive species was to occur. Performed field vegetation analysis on transects next to the Santa Ana River, providing information on the percent cover of species, with a focus on nonnative invasive, such as giant reed (*Arundo donax*) and broadleaved pepperweed (Lepidium latifolium), which are having a detrimental effect on the river.

Otay Conveyance Pipeline Project, Otay Water District, San Diego County, California. As a biologist, completed rare plant surveys, vegetation mapping, burrowing owl and Quino checkerspot butterfly surveys.

Santa Ana River Marsh Restoration, USFWS, Orange County, California. As a biologist, conducted a floristic inventory and vegetation mapping within the Santa Ana River Marsh Restoration Area.

Van Norman Vegetation Mapping and Rare Plant Surveys, Los Angeles Department of Water and Power, Los Angeles, California. Completed all vegetation mapping and rare plant surveys for a dredging project that the Los Angeles Department of Water and Power had to perform. It needed to clear vegetation right next to the stream bed. Also monitored for vegetation removal having crews avoid any bird populations.

Santa Ana River Valley Nonnative Vegetation Removal and Bird Survey Project, Norco, California. Served as a biologist assisting with bird use counts and assisting in focused protocol-level surveys for the least Bell's vireo as part of a 5-year study to measure the effects of invasive nonnative vegetation removal within a 250-acre section of the Santa Ana River Valley on Federally listed and resident bird species.

Laurel Ridge Storm Drain Biological Assessment, City of San Diego, California. As a biologist worked on a field assessment reviewing the rare plants, soils, and wildlife at Laurel Ridge, and directed the rare plant surveys for project site, wrote a constraints analysis, and the BTR.

Relevant Previous Experience

Arctostaphylos Taxonomic Studies, Contra Costa and Monterey Counties, California. Studied under University of California (UC), Berkeley program for *Arctostaphylos*. This program focused on taxonomic and ecological characteristics of the particular genus. Studied under *Arctostaphylos* experts, Mike Vasey PhD. and Tom Parker PhD. specifically researching the Arbutoideae group from an evolutionary context. Studied rare *Arctostaphylos* like pallid manzanita (*A. pallida*) both in the field and taxonomically. Additionally, focused on unusual characters of the *Arctostaphylos* genus reflecting the role of *Arctostaphylos* in the history of California taxonomy.

Bumble Bees of California Training Encinitas, California. Ms. Bergman participated in the "Bumble Bees of California" workshop (presented by Jaime Pawelek of Wild Bee Garden Design/ Essig Museum Research Associate) (November 2019). This training included a one-day specialized bumble bee training which focused on the four California candidate species, Crotch bumble bee (*Bombus crotchii*), Franklin bumble bee (*Bombus franklini*), Western bumble bee (*Bombus occidentalis occidentalis*), and Suckleyi Cuckoo bumble bee (*Bombus suckleyi*). Lecture topics included classification and bee morphology; identification of species; life history and ecology and sampling protocols. A large portion of the workshop included identification of specimens using a microscope and guidebook "Bumble Bees of the Western United States" (by Koch, Strange, and

California State Parks Fire Recovery Management Plan, San Diego, California. Designed a fire recovery plan based on the management of fuel loads at Cuyamaca Rancho State Park. Determined the number of species that had survived after reviewing burn severity levels throughout the state park. These severity levels were due to fuel load levels. Found that larger numbers of non-native grasses were found in more severely burned sites and she designed a tree planting and management strategy for future planting (specifically pine) because the oak species were recovering naturally.

Cuyamaca Restoration Project GIS ArcMap Analysis of Conifers, California State Parks and San Diego State University (SDSU), San Diego, California. Performed research on individual vegetation, vegetation communities, soils, fire history, topography, substrate, seedling/sapling clumping, animal caching, and age determination. Gained experience with Systat, GPS , Endnote software, and grant writing.

Ivy Removal and Restoration, Portland Parks and Recreation, No Ivy League, Portland, Oregon. Worked in Forest Park on an urban ecology project studying the effects of the invasive English ivy (*Hedera helix*) on native plant diversity. Studied the bryophyte populations where English ivy was most invasive. Also assisted in the removal of English ivy from sections of the park.

Determining the Genetic Structure of Saltgrass, Portland State University, Oregon. Propagated saltgrass (Distichilis spicata) for genetic structure research. Assisted in researching the genetic structure of a wetland grass and its role in maintaining spatial segregation of the sexes to stabilize wetland ecosystems.

Determining the Invasive Effects on Broadleaf Cattail, Portland State University, Oregon. Studied a variety of invasive nonnative grasses in local waterways and how these grasses can affect the reproductive effort of broadleaf cattail (*Typha latifolia*), a native species.

Opal Creek Ancient Forest Center Rare Plant Mapping, Cascade Mountains, Salem, Oregon. Studied *Goodyera* and *Listera* species in relation to varying land use history while comparing O-horizon depth, soil moisture, light levels, canopy cover, and plant diversity.

Sea World Adventure Parks, San Diego, California. While working in the Conservation Education Department, assisted with marine mammal and fish education, and served as a tour guide.

Teaching Positions

- Instructor, Vernal Pool CRAM –Plant identification for vernal pools
- Instructor, San Diego State 201 B Biological Sciences for science majors

Publications

Franklin, Janet and Bergman, E. 2011. Patterns of Pine Regeneration Following a Large, Severe Wildfire in the Mountains of Southern California. The Journal of Canadian Forestry (41): 810–821.

Bergman, E. and Ackerman, J.D. 2006. Land Use History Affects the Distribution of a Saprophytic Orchid *(Wullschlaegelia calcarata)* in Puerto Rico's Tabonuco Forest Biotropica.

Specialized Training and Additional Certifications

- Certified Pesticide Applicator License, No. QAC 133983
- Rangeland Management Certification, Oregon State
- Emergency Response Certification: AED, CPR, Oxygen Administration, PDT
- RSO Certification
- UC Berkeley, Flora of the San Jacinto Mountains, 2024
- Bumble Bee Training, Bees of California, Dudek Encinitas Office 2019
- California's Native Bees: Biology, Ecology and Identification, 2016
- Oregon State University, Undergraduate Coursework, Agricultural Science and Rangeland Management, Ongoing
- Wetland training Institute, Wetland delineation training, 2015
- Desert Tortoise Council Handling Feb. 2014, Workshop completed-observed authorized demonstrations and requirements
- UC Berkeley, Tarweeds, 2012
- UC Berkeley, Carex, 2012
- UC Berkeley, Juncus, 2012
- Death Valley – UC Berkley Rare Flora of the Panamint Mountains, 2011
- UC Berkeley, Advanced Grasses, 2011
- MSCP Rare plant Monitoring Workshop, 2010
- CNPS, Mojave Desert Fall Blooming Endemic Plant Workshop, 2009