Appendix D-11
Golden Eagle Survey Report

Golden Eagle (*Aquila chrysaetos*) Survey Report, Lugo-Victorville Remedial Action Scheme Project, San Bernardino County, California and Clark County, Nevada

Spring 2021

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June 8, 2021

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EXECUTIVE SUMMARY

This Golden Eagle (*Aquila chrysaetos*) Survey Report (Report) provides the results of a Phase 1 occupancy survey for golden eagles performed for Southern California Edison's (SCE) Lugo-Victorville 500 kilovolt (kV) Transmission Line Remedial Action Scheme Project (LVRAS or Project) in San Bernardino County, California and Clark County, Nevada. Survey methodologies followed a modified approach of the U.S. Fish and Wildlife Service's (USFWS) *Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations* (Protocol) (Pagel et al., 2010). The survey area encompassed suitable golden eagle nesting habitat within two miles of the project alignment, an area of approximately 323,711 acres. EnviroPlus Consulting, LLC (EPC) golden eagle biologists conducted an aerial helicopter survey of all suitable eagle nesting habitat within the survey area on March 22 and March 23, 2021. This survey focused on locating golden eagle nests within the survey area and determining nest occupancy and status.

Three golden eagle nesting territories containing a total of five nest structures were identified. Evidence of occupancy during the current nesting season was documented in two of the three nesting territories. Of the three active nests, only one was occupied at the time of the survey. The occupied nest was located approximately 2.55 miles south of the project alignment in the Newberry Mountains. The two other active nests were unoccupied at the time of the survey and were 0.75 miles south and 2.22 miles northwest of the alignment, respectively. The two inactive nests were in deteriorated condition and located 1.15 miles north and 2.31 miles northwest of the alignment, respectively. All golden eagle nests were associated with rocky cliff habitats. No golden eagle nests were observed on transmission structures within the survey area. The presence of high-quality golden eagle nesting habitat, including [large rocky outcrops and vertical cliff structures], within 1-mile of the alignment was limited.

Forty-five red-tailed hawk (*Buteo jamaicensis*), 36 common raven (*Corvus corax*), five golden eagle, two prairie falcon (*Falco mexicanus*), and one unknown falcon nests were located and mapped during the survey. In addition, incidental non-nest associated observations were made of 32 red-tailed hawks, 11 bighorn sheep (*Ovis canadensis*), six turkey vultures (*Cathartes aura*), five prairie falcons, three golden eagles, one American kestrel (*Falco sparverius*), and one short-eared owl (*Asio flammeus*).

INTRODUCTION

Project Location and Description

The Project is located within SCE's existing right-of-way (ROW) and extends from SCE's Gale Substation in San Bernardino County, California (1 mile east of Daggett), through SCE's Pisgah Substation (Interstate 40 near Ludlow, California), to near Nipton Road (Joshua Tree Highway) within Clark County, Nevada. The Project includes two segments: Segment 1 (Gale to Pisgah), which extends for approximately 29 miles between SCE's Gale Substation and SCE's Pisgah Substation, and Segment 2 (Pisgah to Nipton), which continues from SCE's Pisgah Substation for 84 miles to a transmission tower located in Nevada, approximately 1.8 miles east of the state line (Figure 1). The Project is required to reliably interconnect and integrate multiple renewable generation projects in eastern California and southern Nevada into SCE's electrical power grid. The primary function of the Project is to prevent thermal overloading on the existing jointly owned Lugo-Victorville 500-kV Transmission Line, which is a major power transfer path between SCE and the Los Angeles Department of Water and Power (BLM, 2020). The installation of a new telecommunication path in the existing utility corridor, including the replacement of optical ground wire, optical fiber nonconducting riser cable, and/or all-dielectric self-supporting fiber-optic cable between the existing Eldorado Substation in Nevada and the Cima, Pisgah, and Gale substations in California will provide reliable communication with generators so that they can be safely taken off-line in a timely manner to prevent thermal overload of the Lugo-Victorville 500kV transmission line by tripping generation in the event of loss of the

Eldorado-Lugo 500kV transmission line, or both this line and the Lugo-Mohave 500kV transmission line.

Regulatory Setting

Golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. Section 668), which prohibits the "take" (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any such activity) of golden eagles. More specifically, the Bald and Golden Eagle Protection Act protects against agitating an eagle to the degree that causes or is likely to cause (1) injury to an eagle, (2) decreased productivity as a result of interfering with normal breeding, feeding, or sheltering habits, or (3) nest abandonment as a result of interfering with normal breeding, feeding, or sheltering behavior (Pagel et al., 2010). Golden eagles are also traditionally protected by the Migratory Bird Treaty Act (Title 16 of the United States Code [U.S.C.] Sections 703–711).

Golden eagles are a Fully Protected Species in California. California Fish and Game Code Sections 3511, 4700, 5050, and 5515 list the bird, mammal, reptile, amphibian, and fish species that are identified as "fully protected." Fully protected wildlife may not be harmed, taken, or possessed. The classification of "fully protected" was California's initial effort to identify and provide additional protection to those wildlife species that were rare or faced possible extinction. Some fully protected species, but not the golden eagle, have also been listed as threatened or endangered species under California's more recent endangered species laws and regulations.

Title I of National Environmental Policy Act (NEPA) (42 U.S.C. Section 4321) requires federal agencies to incorporate environmental considerations in their planning and decision-making processes. Federal agencies are to prepare detailed statements, Environmental Impact Statements and Environmental Assessments, assessing the environmental impact of and alternatives to federal actions with the potential to significantly affecting the environment. Title II of NEPA established the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations Parts 1500-1508) to oversee NEPA implementation by ensuring that federal agencies meet their obligations under NEPA, overseeing federal agency implementation of the environmental impact assessment process, and issuing regulations and other guidance to federal agencies regarding NEPA compliance. The LVRAS project is subject to assessment pursuant to NEPA; the Bureau of Land Management is the lead federal agency. It is anticipated that the NEPA document may include protective measures addressing golden eagles.

The California Environmental Quality Act (CEQA) (Public Resources Code Section 15000, et seq.) requires identification of significant environmental effects of proposed projects (including impacts on biological resources) and avoidance (where feasible) or mitigation of the significant effects. CEQA applies to "projects" proposed to be undertaken or requiring approval by state and/or local governmental agencies. "Projects" are activities that have the potential to have a physical impact on the environment (Section 21065). Pursuant to Section 15063 of Title 14 of the California Code of Regulations, if the Lead Agency determines that any aspect of the project, individually or cumulatively, may cause a significant environmental impact, an Environmental Impact Report must be prepared. However, if the Lead Agency finds the project would not result in significant environmental impacts, either as proposed or modified to include mitigation measures identified in the Initial Study, a Negative Declaration or Mitigated Negative Declaration, as appropriate, will be prepared instead. The LVRAS project is under review pursuant to CEQA; California Department of Fish and Wildlife (CDFW) is the lead state agency. It is anticipated that the resulting CEQA document will include protective measures addressing golden eagles.

Golden Eagle Natural History

Golden eagles are large aerial predators that live in a wide range of diverse habitats, including grasslands, open tundra, islands, forested mountains, arid deserts, and chaparral woodlands (Kochert et al., 2002; Pagel et al., 2010). They prey mainly on small rodents, reptiles, and birds, and larger prey including black-tailed jackrabbits (*Lepus californicus*), foxes (*Vulpes* sp.), coyotes (*Canis latrans*), mule deer (*Odocoileus hemionus*), and elk (*Cervus canadensis*) fawns (Olendorff, 1976; Collins and Latta, 2009). (Carnie, 1954; Bloom and Hawks, 1982), but are also well-known scavengers (Kochert et al., 2002).

Golden eagles are sensitive to many anthropogenic pressures (Palmer, 1988) and nesting territories are typically located in open to semi-open habitats away from urban settings (McIntyre, 1995; Pagel et al., 2010). Mated pairs typically build large stick nests on rocky cliffs, in the upper portions of large trees, on protected shelves of steep canyon walls, and on well-elevated man-made structures (e.g. transmission towers and windmills; Kochert et al., 2002). Nest locations typically provide an unobstructed view of the surrounding habitat. Multiple nests within a single active nesting territory are common (Palmer, 1988) and nesting site fidelity is high (Collins and Latta, 2009). Nests are often found in highest densities in open habitats.

Courtship behaviors, including display flights, vocalizations, and stick carrying, indicate the onset of the golden eagle reproduction season (Ellis, 1979). In southern California, golden eagles typically commence breeding in January. Egg laying occurs in early spring (February–March), egg hatching in late spring to early summer (April–May), rearing of chicks in summer (May–June), and fledging in late summer (June–July; B. Latta, 2012, pers. comm.; Hoechlin, 1976; Hunt et al., 1997). Adults continue to provide food for fledged chicks and teach them to hunt well into the fall months (B. Latta, 2012, pers. comm.)

Factors negatively affecting golden eagles in California include anthropogenic mortality and nest failure and population declines associated with habitat loss and degradation (Bittner et al., 2003; Pagel et al., 2010; Lovich, 2015).

METHODS

Survey Area

The survey area consisted of a buffer extending two miles from the LVRAS project alignment, including Segment 1 (Gale to Pisgah) and Segment 2 (Pisgah to Nipton), but excluding lengthy existing unpaved access roads to the alignment from paved public roads, as the project would only use those roads for ingress/egress. The survey area included portions of the Devils Playground, Cady Mountains, Bristol Mountains, Mojave Valley, and Mojave National Preserve (Figure 1).

Terrain is variable across the survey area and includes expansive areas of sandy creosote bush (*Larrea tridentate*) flats, with intervening rocky desert foothills, cliff ecosystems, and dry alluvial arroyos. Elevations within the survey area ranges from approximately 1,985 feet above mean seas level (AMSL) in the southwest, to approximately 4,140 feet AMSL in the northeast.

The southwestern half of the survey area intersects and is adjacent to numerous rocky mountain ranges, including the Newberry and Rodman mountains south of Segment 1, the Cady Mountains north of the intersection of Segment 1 and Segment 2, and the Bristol Mountains south of the western portion of Segment 2, which provide excellent golden eagle nesting habitats. Segment 2 passes over the southern finger of the Old Dad Mountains. The northeastern half of the survey area traverses the Ivanpah Valley, which predominately features open sandy flats. Suitable golden eagle nesting habitats in the northeastern half of the project area were primarily located outside of the survey limits in the Ivanpah and New York mountains. The project alignment is immediately adjacent to several transmission lines, and although not common when higher-quality cliff habitat is located in the vicinity, golden eagles are known to nest on large flat transmission structures platforms.

Pre-survey Literature Review and Habitat Assessment

EPC reviewed the USFWS Protocol (Pagel et al., 2010) and numerous other relevant references related to golden eagle nesting ecology, nesting phenology, chick development, feeding ecology, and population trends (see *References*) prior to the field survey. Potential golden eagle nesting habitat within and adjacent to the survey area was determined through review of aerial imagery, land cover data maps, and digital GIS databases, including Google Earth. Historic records provided by USFWS and records from the California Natural Diversity Database (CNDDB; CDFW, 2021) were reviewed for reference; however, the survey was conducted objectively, with the intention of establishing a fresh baseline.

Field Methods

Survey Protocol Requirements

The following helicopter survey protocol, based on the USFWS Protocol (Pagel et al., 2010), was used to determine the presence and activity of nesting golden eagles within the survey area:

- The survey was performed by qualified observers with experience conducting golden eagle aerial surveys.
- All potential suitable nesting habitats within the survey area was surveyed.
- Timing of the Phase 1 occupancy survey coincided with late egg laying and the presence of early-stage chicks.
- The survey was be limited to weather conditions favorable for aerial surveys, golden eagle activity, and preferably during morning hours.
- Active nests, occupied territories, and alternate nests were documented and reported along with pertinent Global Positioning System (GPS) data.
- Cliff nesting habitats were approached from the front rather than from behind or overhead.
- Hovering at a nest did not exceed 30 seconds and was at least 66 horizontal feet from the nest during data collection.

Survey Timing

The aerial survey for this project was planned to coincide with known nesting stages of breeding golden eagles in southern California (Hoechlin, 1976; Bittner et al., 2011, Meador et al., 2013). Specifically, the Phase 1 nest occupancy survey was scheduled to coincide with late egg laying and the presence of early-stage chicks (Pagel et al., 2010). A phase 2 productivity survey was not completed as part of the aerial survey (see *Limitations*).

Occupancy Survey

On March 22 and 23, 2021, EPC conducted a Phase 1 aerial occupancy survey of the survey area (Figure 2) to detect and document golden eagles and their nests. The visual-encounter survey was performed using a Bell 429 helicopter owned and operated by SCE. Dr. Eric Dugan (Observer 1; front left seat) served as navigator for the survey and primary observer for the left side of the helicopter. Dave Lohr (Observer 2; back right seat) served as the primary observer for the right side of the helicopter and the survey photographer. Helicopter pilot Hakon Satvedt has extensive experience performing eagle and aerial wildlife surveys.

The survey team visited all suitable golden eagle nesting habitats within the survey area. Generally, the flight path followed the existing transmission corridor until suitable habitat was observed adjacent to either side of the project alignment. At that point, suitable habitats were surveyed prior to the helicopter returning to the transmission corridor. Multiple passes at different elevations were flown to view nesting habitats associated with steep cliff ecosystems. Nests were approached briefly and at a distance close enough to allow the observers to photograph and determine the status of each nest but without disturbing the nest. Nests located on transmission structures were viewed from above using binoculars to determine species association and status. If incubating adults were observed, the survey team avoided approaching those locations and viewed those nests from a distance.

Positional Data and Photography

Location-specific data were recorded with a Samsung hand-held tablet (SM-T500) with a typical accuracy of about four meters. Each observation was assigned a sequential and unique identifier. Flight tracks were recorded using a Lowrance iFinder Pro and Garmin GPSMAP 78, both accurate to approximately four meters 95% of the time.

Photographs were taken with a Nikon D300 digital camera fitted with a 70x210 millimeter optical telephoto lens. The telephoto lens allowed for quality images to be collected from a distance, thereby limiting disturbance to nesting raptors and sensitive wildlife. Subsequent review of the images in the office provided additional data regarding species identification, and nesting status.

Data Collected

The survey area boundaries and historic golden eagle nests and nesting territories were downloaded to tablet and GPS units and appeared on each unit's screen. The survey team used headset communication during the entirety of the survey to facilitate efficiency and accuracy of observations, resolving questions or problems, and reporting significant findings in real time.

Data collected for each nest included the following (based on Pagel et al., 2010):

- Date
- Location of observation (Universal Transverse Mercator [UTM], WGS84, Zone 11)
- Species
- Nest condition
    - Good — Nest maintained or added to within the last 1 to 2 years; nest containing a bowl made of yucca or other new nesting materials
    - Fair — No evidence of recent use; no sign of recent maintenance; nest not used within the last 1 to 2 years
    - Poor — Currently inactive; deteriorated condition; extensive signs of weathering; significant slumping of parts of the nest; significant decomposition of nest material
- Nest status

  - Occupied — A nest being used in the current year; adult, eggs, and/or young observed at the nest; considered occupied throughout the egg-laying to post-fledging dependency stages
  - Active — Evidence of fresh nesting material in the nest; the presence of a newly constructed bowl; any other signs of preparation for egg-laying; active nests may not end up being occupied in a given year
  - Inactive — Not currently being used; lacking evidence of recent maintenance, adults, eggs, chicks, and dependent young; inactive have the potential of becoming active in subsequent breeding seasons
- Nest aspect
- Nest type (e.g., stick nest, scrape)
- Nest substrate (e.g., cliff, tree, structure)
- Nest height
- Number of eggs (when possible)
- Number of chicks (when possible)
- Age class of raptors if determinable
- Behavior of species observed
- Pertinent notes

Weather conditions were recorded at the start and end of each flight. Weather conditions included the shaded air temperature at five feet, wind speeds and direction, and relative humidity. Wind speeds were measured with a Kestrel® 4000 Pocket Weather Tracker Measurements were taken until average wind speed stabilized.

While the survey methodology focused primarily on detection of nesting golden eagles, opportunistic observations of other nesting raptors and notable wildlife were recorded.

Survey Personnel

The aerial survey was conducted by experienced raptor and golden eagle biologists Dr. Eric Dugan and Dave Lohr. Dr. Dugan and Mr. Lohr meet the Observer Qualifications recommended for "helicopter-borne raptor surveys around cliff ecosystems" as presented in the USFWS Protocol (Pagel et al., 2010). A brief summary of their eagle survey experience (Attachment 1) and their curriculum vitae (Attachment 2) are provided.

RESULTS

Weather Conditions

The March 22, 2021 survey was conducted during ideal weather conditions for observation of golden eagles (Table 1). Light north and west winds were prevalent during the survey with wind speed of six miles per hour (mph) at the start of the survey (1030 hours) and 16 mph at the end of the survey (1620 hours). The temperatures ranged from 54 degrees Fahrenheit (°F) at 0845 hours to 66°F at end of the survey (Table 1) and were within accepted standards (Pagel et al., 2010). No precipitation fell during the survey.

The March 23, 2021 survey was conducted during good weather conditions for observation of golden eagles (Table 1). Light west-southwest and north-northwest winds were prevalent during the survey with wind speed of eight mph at the start of the survey (0840 hours) and 15 mph at the end of the survey (1415 hours). The temperatures ranged from 48°F at 0840 hours to 64°F at end of the survey (Table 1) and were within accepted standards (Pagel et al., 2010). No precipitation fell during the survey.

Excessive winds and downdrafts were not a significant issue during the majority of the survey. Gusting winds did prevent close approaches to some cliff and canyon habitats; however, all of the aforementioned nesting habitat features were surveyed from a distance that allowed for high visual acuity while minimizing the potential for disturbing the nests. Surveyors were afforded access to all suitable nesting habitats within the survey area.

Flight Tracks

A complete flight track for the survey is shown in Figure 3. The flights departed from and returned to the Chino Airport, Chino, California. The survey and transit flight time required a total of 12.25 flight hours.

Occupancy Survey

Three golden eagle nesting territories containing a total of five nests were identified during the survey (Photographs 1 to 3, Figure 2, Table 2). All golden eagle nests were associated with rocky cliff habitats. No golden eagle nests were observed on transmission structures within the survey area. Evidence of occupancy during the current nesting season was noted in two of the three nesting territories.

Newberry Mountains Nesting Territory

Two active nests were observed in the Newberry Mountains nesting territory. One nest was occupied at the time of the observation. The occupied nest is located 2.55 miles south of the alignment and contained an adult female incubating eggs or brooding young during the observation (Photograph 1, Nest #28, Figure 2, Table 2). A second active, but unoccupied nest, was observed 0.75 miles south of the alignment. This nest showed signs of nest decoration and maintenance during the current nesting season (Photograph 2, Nest #30, Figure 2, Table 2). Based on the proximity of the two nests, the second nest is believed to be an alternate nest associated with the aforementioned pair incubating or brooding eggs.

Cady Mountains Nesting Territory

Two unoccupied golden eagle nests were observed just beyond the survey buffer in the Cady Mountains nesting territory. One active nest was observed 2.22 miles northwest of the alignment and had signs of recent use, including abundant whitewash and fresh nesting material (Nest #38). A second nest located 2.31 miles northwest of the alignment was inactive, in deteriorating condition, and showed no signs of recent use (Nest #37).

Old Dad Mountain Nesting Territory

A large golden eagle nest was observed 1.15 miles north of the alignment in the Old Dad Mountain nesting territory (Photograph 3, Nest #26, Figure 2, Table 2). The nest was unoccupied and in deteriorated condition. Old Dad Mountain contains abundant suitable and high-quality golden eagle nesting habitats, and additional nests may be present within this territory. Due to gusting winds and associated safety concerns, the helicopter was not able to maintain a hover long enough to support prolonged searches of several potential nesting habitat features.

Four adult golden eagles were observed (Figures 2 and 4, Table 3). These included the previously noted adult female incubating the occupied nest in the Newberry Mountains nesting territory (Photograph 1), an adult pair perched next to each other on a transmission structure (Photograph 4), and a lone male perched on a transmission structure (Photograph 5). None of the three golden eagles observed perched on transmission structures were associated with a nesting territory identified within the survey area.

Additionally, 45 red-tailed hawk (*Buteo jamaicensis*), 36 common raven (*Corvus corax*), two prairie falcon (*Falco mexicanus*), and one unknown falcon nests were located and mapped during the survey (Figure 2, Table 4). Of these, 41 red-tailed hawk and 30 common raven nests were observed on transmission structures along the existing LVRAS utility corridor. Many active red-tailed hawk and common raven nests were observed to be in the late nest building and early incubation stages.

The presence of eggs or chicks could not be confirmed in the majority of nests with incubating adults present. The surveyors limited hovering time in the vicinity of nests containing adults and therefore did not have the opportunity to inspect the nests for eggs or young. Due to the timing of the survey, golden eagles, raptors, and common ravens observed on nests were presumed to be incubating eggs or brooding very young chicks.

Incidental observations (i.e., not associated with a nest) were made of 32 red-tailed hawks, 11 bighorn sheep (*Ovis canadensis*) (observations were made from altitudes that avoided significantly disturbing the sheep), six turkey vultures (*Cathartes aura*), five prairie falcons, one American kestrel (*Falco sparverius*), and one short-eared owl (*Asio flammeus*) (Figure 4, Table 5).

Limitations

Due to contracting, scheduling, and access delays, the Phase 1 occupancy surveys were conducted later in the protocol period than desired. In addition, to avoid bighorn sheep lambing, which may occur in the mountain ranges within the project area beginning in April, no Phase 2 productivity surveys were conducted. It is possible that nests found to be unoccupied had been occupied and abandoned or failed early in the current nesting season. However, the surveyors were able to document valuable data such as the condition of existing nests, presence of new nesting material, presence of recent whitewash, and other indicators of recent nesting attempts.

While not the focus of the survey, it is relevant to note that aerial surveys are known to result in underrepresentation of smaller raptors and ground-dwelling species (e.g., burrowing owl [*Athene cunicularia*], sharp-shinned hawk [*Accipiter striatus*], and American kestrel). Surveyors are primarily focused on detecting golden eagle nesting features further adding to the likelihood of not detecting smaller species. Additionally, crepuscular and nocturnal raptors and mammals are unlikely to be detected. Observations of species other than golden eagles were recorded incidental to the focused survey for golden eagle presence and nesting.

SUMMARY AND CONCLUSIONS

Three golden eagle nesting territories containing a total of five nests were observed. Evidence of occupancy during the current nesting season was noted in two of the three nesting territories. Of the three active nests, only one was occupied. The occupied nest (Nest #28) was located approximately 2.55 miles south of the project alignment in the Newberry Mountains. The two other active nests were unoccupied at the time of the survey and were 0.75 miles south (Nest #30) and 2.22 miles northwest (Nest #38) of the alignment, respectively. The two inactive nests were both in deteriorated condition and located 1.15 miles north (Nest #26) and 2.31 miles northwest (Nest #37) of the alignment. All golden eagle nests were associated with rocky cliff habitats. No golden eagle nests were observed on transmission structures within the survey area.

In addition to golden eagles, three cliff-nesting species, including 45 red-tailed hawk, 36 common raven, two prairie falcon, and one unidentified falcon nests were observed during the survey. Fifty-six incidental observations were made of species not associated with nests, including 32 red-tailed hawks, 11 bighorn sheep, six turkey vultures, five prairie falcons, one American kestrel, and one short-eared owl.

One mile is the current accepted standard avoidance buffer for active golden eagle nests for transmission line projects. One golden eagle nest (Nest #30) was observed within one mile of the alignment, in the Newberry Springs Mountains nesting territory. That nest, which showed recent signs of nest decoration and maintenance, likely represents an alternate nest location for the nearby pair observed incubating or brooding young in Nest #28 during the survey. Generally speaking, the presence of suitable golden eagle nesting habitat within one mile of the alignment is limited. However, future ground surveys should be conducted in the Newberry Mountain, Old Man Mountain, and Cady Mountain nesting territories to determine occupancy and productivity of those nesting territories.

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TABLES

Table 1. Personnel and weather data for aerial golden eagle surveys for the LVRAS project (Spring, 2021)

Date	Observer 1	Observer 2	Pilot	Start Time (PDT)	End Time (PDT)	Start Temp (°F)	End Temp (°F)	Start Wind Speed (mph)	End Wind Speed (mph)	Start Precipitation (in.)	End Precipitation (in.)
3/22/21	Eric Dugan	Dave Lohr	Hakon Satvedt	1030	1620	54	66	6	16	0	0
3/23/21	Eric Dugan	Dave Lohr	Hakon Satvedt	0840	1415	48	64	8	15	0	0

PDT = Pacific Daylight Time

°F = degrees Fahrenheit

mph = miles per hour

in. = inches

Table 2. Aerial golden eagle survey nest data for the LVRAS project (March 22-23, 2021)

Bird Nest ID[1]	Species	Nest Status	UTM Zone 11S Meters E	UTM Zone 11S Meters N	Nest Site Description	Nest Activity	No. of Eggs	No. of Chicks	Nest Condition
26	Golden eagle	Inactive	604254.1	3884446.2	Cliff	Unknown	0	0	Poor
28	Golden eagle	Occupied	524386.5	3851041.7	Cliff	Incubation	Unknown	Unknown	Good
30	Golden eagle	Active	527771.6	3853146.2	Cliff	Nest Building	0	0	Good
37	Golden eagle	Inactive	559490.9	3857317.1	Cliff	Unknown	0	0	Poor
38	Golden eagle	Active	559235.1	3857319.7	Cliff	Nest Building	0	0	Good

Footnotes:
1 Bird nest IDs are not sequential because the IDs were assigned in chronological order of observation. See also Table 4.

ID = identification

UTM = Universal Transverse Mercator

Table 3. Golden eagle observations for the LVRAS project (March 22-23, 2021)

ID	Species	Number of individuals	UTM Zone 11S Meters E	UTM Zone 11S Meters N	Notes
9	Golden eagle	2	647783.2	3913156.7	Pair perched together on transmission tower
45	Golden eagle	1	625573.8	3896523.5	Adult male perched on transmission tower
51	Golden eagle	1	524386.5	3851041.7	Incubating female in nest

Table 4. Aerial survey nest data for the LVRAS project (March 22-23, 2021)

Bird Nest ID[1]	Species	Nest Status	UTM[2] Zone 11S Meters E	UTM[2] Zone 11S Meters N	Nest Site Description	Nest Activity	No. of Eggs	No. of Chicks	Nest Condition
1	Red-tailed hawk	Inactive	660636.7	3923690.4	Cliff	Unknown	0	0	Good
2	Red-tailed hawk	Inactive	660603.7	3923693.8	Cliff	Unknown	0	0	Good
3	Common raven	Inactive	663474.1	3923631.6	Cliff	Unknown	0	0	Good
4	Red-tailed hawk	Active	669360.0	3933352.5	Utility Structure	Nest Building	0	0	Good
5	Red-tailed hawk	Inactive	668606.1	3932288.9	Utility Structure	Unknown	0	0	Good
6	Red-tailed hawk	Active	668279.1	3932055.9	Utility Structure	Nest Building	0	0	Good
7	Common raven	Active	667844.0	3931260.8	Utility Structure	Nest Building	0	0	Good
8	Red-tailed hawk	Active	667426.9	3930853.3	Utility Structure	Nest Building	0	0	Good
9	Common raven	Occupied	666464.9	3930064.3	Utility Structure	Incubation	n/a	n/a	Good
10	Red-tailed hawk	Occupied	665757.4	3929639.3	Utility Structure	Incubation	n/a	n/a	Good
11	Common raven	Inactive	665726.5	3929327.4	Utility Structure	Unknown	0	0	Good
12	Common raven	Inactive	663819.2	3927655.3	Utility Structure	Unknown	0	0	Good
13	Red-tailed hawk	Active	663423.0	3927291.6	Utility Structure	Nest Building	0	0	Good
14	Red-tailed hawk	Inactive	662579.6	3926730.3	Utility Structure	Unknown	0	0	Good
15	Red-tailed hawk	Active	662152.9	3926111.5	Utility Structure	Nest Building	0	0	Good
16	Red-tailed hawk	Occupied	644900.2	3910531.9	Utility Structure	Incubation	n/a	n/a	Good
17	Red-tailed hawk	Inactive	643170.2	3909083.8	Utility Structure	Unknown	0	0	Good
18	Red-tailed hawk	Inactive	643418.1	3909127.8	Utility Structure	Unknown	0	0	Good
19	Red-tailed hawk	Active	639806.4	3905870.9	Utility Structure	Nest Building	1	0	Good
20	Red-tailed hawk	Inactive	632944.9	3900577.3	Utility Structure	Unknown	0	0	Good
21	Red-tailed hawk	Active	627811.6	3897689.4	Utility Structure	Nest Building	0	0	Good
22	Red-tailed hawk	Inactive	627299.8	3894342.1	Outcrop	Unknown	0	0	Good
23	Common raven	Active	626347.5	3894016.2	Outcrop	Nest Building	0	0	Good
24	Common raven	Occupied	624215.1	3895851.1	Utility Structure	Incubation	n/a	n/a	Good
25	Red-tailed hawk	Inactive	622742.0	3893327.9	Cliff	Unknown	0	0	Poor
27	Common raven	Inactive	605174.2	3883635.3	Cliff	Unknown	0	0	Good
29	Prairie Falcon	Active	527769.8	3853087.6	Cliff	Nest Building	0	0	Good

Bird Nest ID[1]	Species	Nest Status	UTM[2] Zone 11S Meters E	UTM[2] Zone 11S Meters N	Nest Site Description	Nest Activity	No. of Eggs	No. of Chicks	Nest Condition
31	Common raven	Occupied	554075.8	3845527.5	Utility Structure	Incubation	n/a	n/a	Good
32	Red-tailed hawk	Active	557528.2	3850123.3	Utility Structure	Nest Building	0	0	Good
33	Unknown Falcon	Active	563216.6	3852402.3	Cliff	Nest Building	0	0	Good
34	Prairie Falcon	Active	563404.0	3854120.4	Cliff	Nest Building	0	0	Good
35	Common raven	Occupied	563391.7	3854000.9	Cliff	Incubation	n/a	n/a	Good
36	Common raven	Active	560514.2	3855774.5	Cliff	Nest Building	0	0	Good
39	Common raven	Inactive	559202.2	3856052.2	Cliff	Unknown	0	0	Good
40	Red-tailed hawk	Inactive	607407.0	3884902.6	Utility Structure	Unknown	0	0	Poor
41	Red-tailed hawk	Inactive	609054.3	3886141.2	Utility Structure	Unknown	0	0	Good
42	Common raven	Inactive	611682.4	3887871.9	Utility Structure	Unknown	0	0	Poor
43	Common raven	Active	614822.8	3889923.5	Utility Structure	Nest Building	0	0	Good
44	Red-tailed hawk	Inactive	615948.9	3890647.3	Utility Structure	Unknown	0	0	Good
45	Common raven	Inactive	616153.2	3890703.9	Utility Structure	Unknown	0	0	Poor
46	Red-tailed hawk	Occupied	616778.7	3891035.2	Utility Structure	Incubation	n/a	n/a	Good
47	Red-tailed hawk	Occupied	618753.5	3892427.2	Utility Structure	Incubation	n/a	n/a	Good
48	Red-tailed hawk	Inactive	619101.3	3892546.5	Utility Structure	Unknown	0	0	Good
49	Common raven	Inactive	620696.5	3893721.4	Utility Structure	Unknown	0	0	Poor
50	Red-tailed hawk	Inactive	621208.2	3893837.1	Utility Structure	Unknown	0	0	Good
51	Common raven	Occupied	621350.7	3894072.5	Utility Structure	Incubation	n/a	n/a	Good
52	Red-tailed hawk	Inactive	622183.4	3894437.4	Utility Structure	Unknown	0	0	Good
53	Common raven	Inactive	622155.5	3894490.1	Utility Structure	Unknown	0	0	Good
54	Red-tailed hawk	Active	622883.4	3894832.8	Utility Structure	Nest Building	0	0	Good
55	Common raven	Inactive	623156.0	3895129.2	Utility Structure	Unknown	0	0	Poor
56	Common raven	Active	623522.7	3895347.7	Utility Structure	Nest Building	0	0	Good
57	Common raven	Active	623860.4	3895536.0	Utility Structure	Nest Building	0	0	Good
58	Red-tailed hawk	Active	624571.6	3895964.6	Utility Structure	Nest Building	0	0	Good
59	Common raven	Inactive	625424.6	3896477.5	Utility Structure	Unknown	0	0	Poor
60	Common raven	Inactive	597893.7	3879039.0	Utility Structure	Unknown	0	0	Poor
61	Red-tailed hawk	Occupied	594715.2	3877918.8	Utility Structure	Incubation	n/a	n/a	Good

Bird Nest ID[1]	Species	Nest Status	UTM[2] Zone 11S Meters E	UTM[2] Zone 11S Meters N	Nest Site Description	Nest Activity	No. of Eggs	No. of Chicks	Nest Condition
62	Common raven	Occupied	594068.4	3877949.3	Utility Structure	Incubation	n/a	n/a	Good
63	Red-tailed hawk	Occupied	592966.9	3877473.5	Utility Structure	Incubation	n/a	n/a	Good
64	Common raven	Active	588948.7	3876735.3	Utility Structure	Nest Building	0	0	Good
65	Red-tailed hawk	Occupied	588579.1	3876685.3	Utility Structure	Incubation	1	0	Good
66	Red-tailed hawk	Inactive	587755.5	3876329.8	Utility Structure	Unknown	0	0	Good
67	Common raven	Inactive	585673.5	3874708.4	Utility Structure	Unknown	0	0	Good
68	Red-tailed hawk	Active	584895.6	3874346.5	Utility Structure	Nest Building	0	0	Good
69	Common raven	Occupied	582205.6	3872355.6	Utility Structure	Incubation	n/a	n/a	Good
70	Red-tailed hawk	Occupied	581766.3	3872276.9	Utility Structure	Incubation	n/a	n/a	Good
71	Red-tailed hawk	Inactive	579929.1	3870285.7	Utility Structure	Unknown	0	0	Poor
72	Red-tailed hawk	Occupied	579223.8	3869649.5	Utility Structure	Incubation	n/a	n/a	Good
73	Red-tailed hawk	Occupied	575493.8	3866104.9	Utility Structure	Incubation	n/a	n/a	Good
74	Common raven	Inactive	575199.8	3865740.6	Utility Structure	Unknown	0	0	Poor
75	Common raven	Inactive	574663.9	3865006.4	Utility Structure	Unknown	0	0	Poor
76	Red-tailed hawk	Inactive	574094.8	3864301.7	Utility Structure	Unknown	0	0	Good
77	Common raven	Inactive	572680.1	3862381.9	Utility Structure	Unknown	0	0	Poor
78	Common raven	Inactive	570460.3	3860579.9	Utility Structure	Unknown	0	0	Good
79	Red-tailed hawk	Inactive	570032.2	3860286.3	Utility Structure	Unknown	0	0	Poor
80	Red-tailed hawk	Inactive	568100.6	3858717.4	Utility Structure	Unknown	0	0	Poor
81	Common raven	Inactive	564581.0	3856311.4	Utility Structure	Unknown	0	0	Poor
82	Red-tailed hawk	Occupied	564121.5	3856236.1	Utility Structure	Incubation	n/a	n/a	Good
83	Red-tailed hawk	Inactive	563826.4	3855852.6	Utility Structure	Unknown	0	0	Poor
84	Red-tailed hawk	Inactive	561651.8	3854222.1	Utility Structure	Unknown	0	0	Poor
85	Red-tailed hawk	Occupied	560827.9	3853604.1	Utility Structure	Incubating	0	0	Good
86	Common raven	Inactive	560317.7	3852921.9	Utility Structure	Unknown	0	0	Poor
87	Common raven	Inactive	558978.4	3851684.5	Utility Structure	Unknown	0	0	Poor
88	Common raven	Inactive	558034.9	3850635.6	Utility Structure	Unknown	0	0	Poor
89	Common raven	Occupied	556134.6	3848708.6	Cell Tower	Incubation	0	0	Good

Footnotes:
1. ID = identification
2. UTM = Universal Transverse

Table 5. Incidental species observations for the LVRAS project (March 22-23, 2021)

ID*	Species	Number of individuals	UTM Zone 11S Meters E	UTM Zone 11S Meters N	Notes
2	Red-tailed Hawk	1	669376.7	3933255.6	Perched on transmission tower
3	Red-tailed Hawk	1	668008.2	3931844.6	Perched on transmission tower
4	Red-tailed Hawk	1	666787.1	3930548.3	Perched on transmission tower
5	Red-tailed Hawk	1	664148.4	3928174.1	Perched on transmission tower
6	Red-tailed Hawk	2	653883.5	3918899.7	Pair perched on transmission tower
7	Red-tailed Hawk	1	651919.8	3917119.6	Perched on transmission tower
8	Prairie Falcon	1	651030.4	3916316.3	In flight
10	Red-tailed Hawk	2	643333.6	3909528.6	Perched on transmission tower
11	Red-tailed Hawk	1	642015.7	3908157.8	Perched on transmission tower
12	Red-tailed Hawk	1	640765.2	3907031.0	Perched on transmission tower
13	Red-tailed Hawk	1	638500.6	3904976.9	Perched on transmission tower
14	Red-tailed Hawk	1	633955.6	3901553.2	Perched on transmission tower
15	Red-tailed Hawk	1	633413.9	3901221.0	Perched on transmission tower
16	Red-tailed Hawk	1	631662.0	3900218.9	Perched on transmission tower
17	Red-tailed Hawk	1	631027.3	3899848.1	Perched on transmission tower
18	Red-tailed Hawk	1	627630.0	3897616.7	Perched on transmission tower
20	Red-tailed Hawk	1	624977.2	3896383.5	In flight
21	Red-tailed Hawk	1	620950.2	3893941.9	Perched on transmission tower
22	Red-tailed Hawk	1	620432.7	3893614.7	Perched on transmission tower
24	Red-tailed Hawk	1	614569.0	3889809.8	In flight
25	Red-tailed Hawk	1	607190.2	3884917.8	Perched on transmission tower
27	Bighorn Sheep	1	606716.1	3886744.2	1 ewe
28	Bighorn Sheep	2	604712.5	3884045.8	2 rams
29	Prairie Falcon	1	526222.3	3852592.4	In flight
30	Turkey Vulture	3	528195.8	3853416.7	
32	Red-tailed Hawk	1	540773.6	3848383.4	Perched on transmission tower
33	Red-tailed Hawk	2	556875.7	3849443.2	Perched on transmission tower

ID*	Species	Number of individuals	UTM Zone 11S Meters E	UTM Zone 11S Meters N	Notes
35	Red-tailed Hawk	1	563008.3	3852051.3	
36	Red-tailed Hawk	1	560445.4	3857495.6	
37	Prairie Falcon	1	559341.2	3855853.7	In flight
38	Bighorn Sheep	8	529727.1	3851109.2	5 ewes, 2 lambs, 1 ram
39	Prairie Falcon	1	530643.0	3850946.5	In flight
40	Short-eared Owl	1	606521.6	3880335.0	Perched on rocky hillside
41	Red-tailed Hawk	1	606686.5	3881338.0	Perched on transmission tower
42	Red-tailed Hawk	1	606370.0	3882192.4	Perched on transmission tower
43	Red-tailed Hawk	1	618259.5	3892079.7	Perched on transmission tower
44	American Kestrel	1	622350.8	3894641.4	In flight
46	Prairie Falcon	1	603905.4	3883560.4	In flight
48	Red-tailed Hawk	1	571792.3	3862145.7	Perched on transmission tower
49	Turkey Vulture	3	571373.5	3860999.5	In flight
50	Red-tailed Hawk	1	571936.0	3864810.3	In flight

* Identification numbers match the Object ID numbers in the GIS data schema for the survey. Some numbers are not included because test points, golden eagle observations (listed separately), and common raven observations have been removed from the table

FIGURES

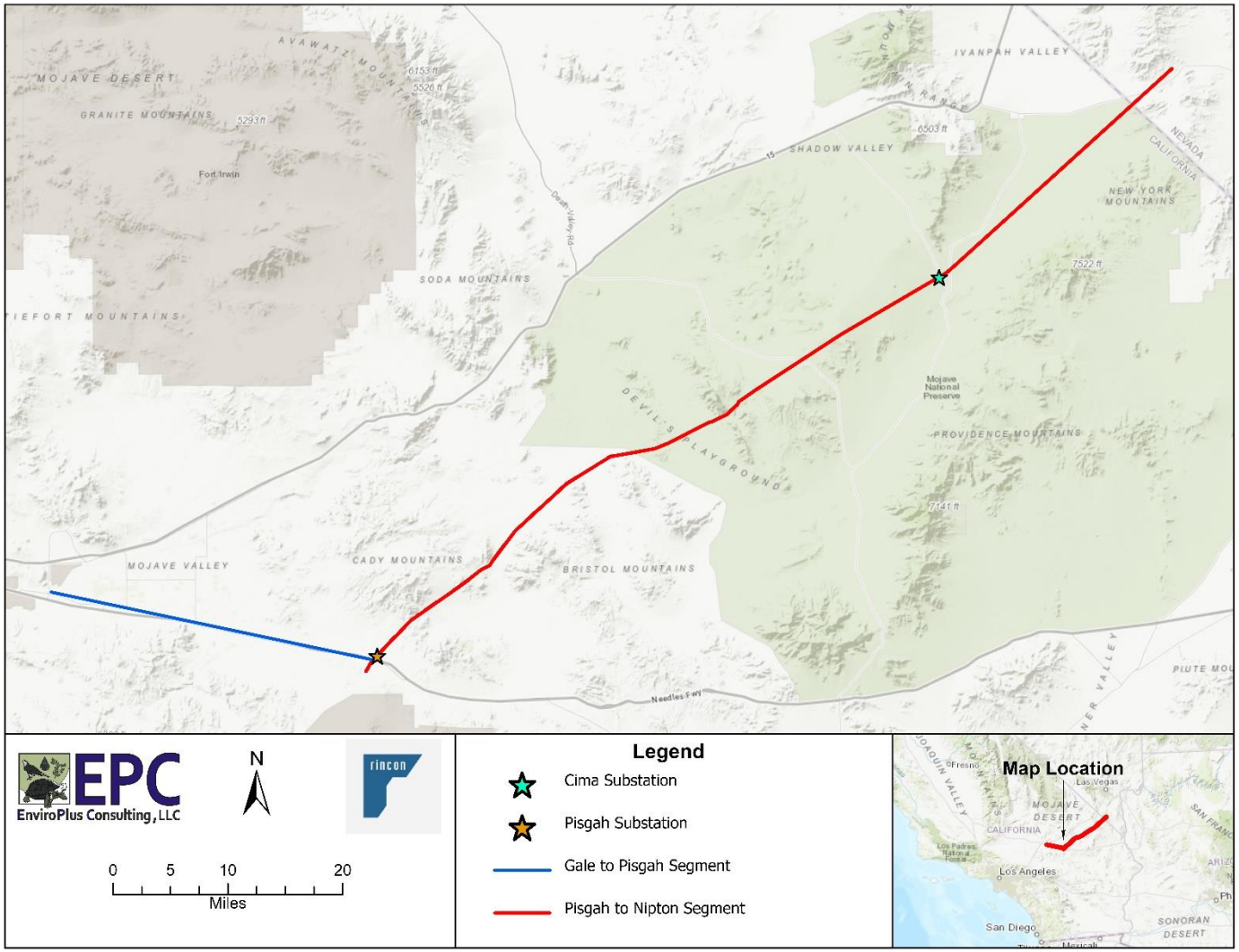

Figure 1. Project vicinity map.

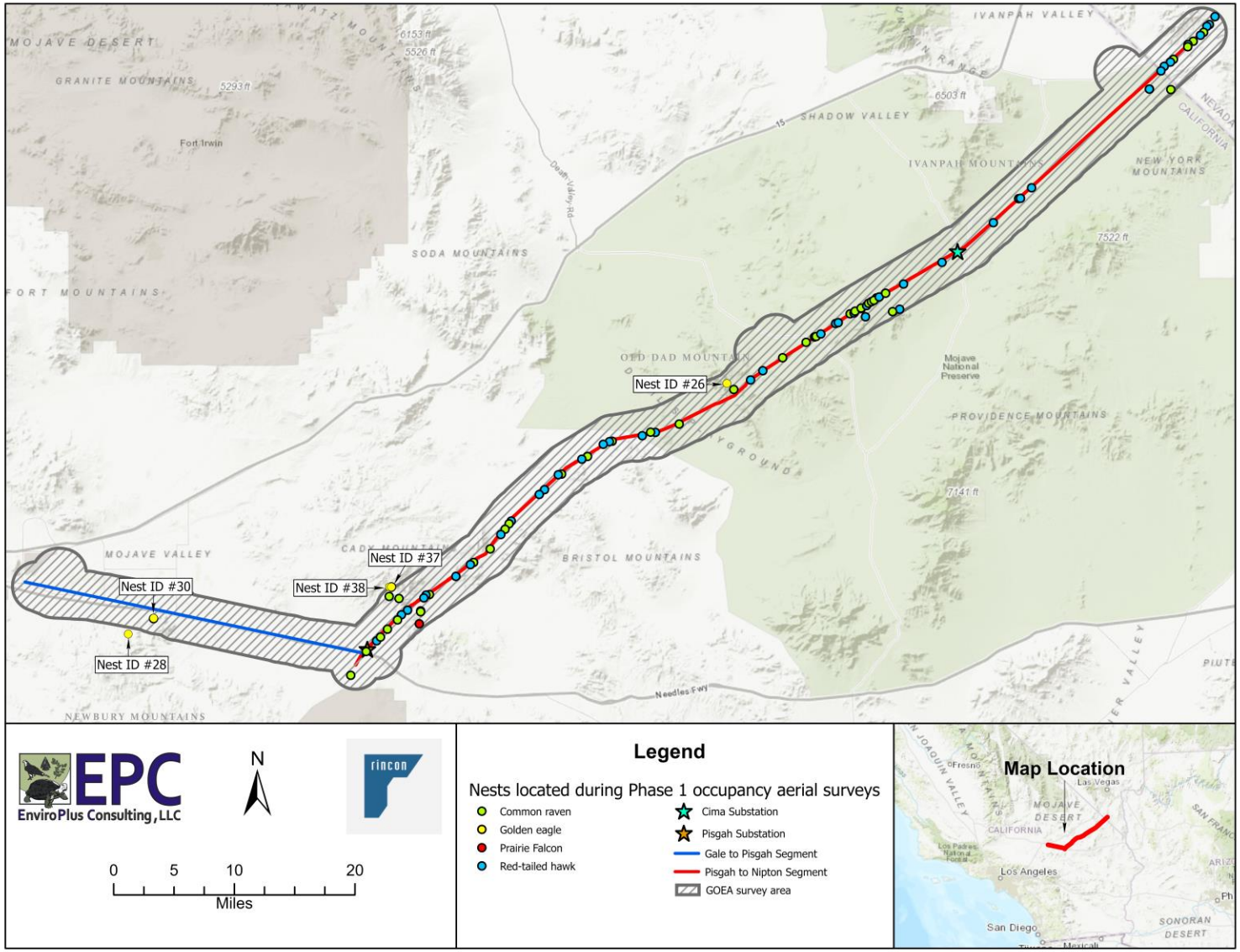

Figure 2. Nests located during Phase 1 occupancy aerial surveys (March 22-23, 2021).

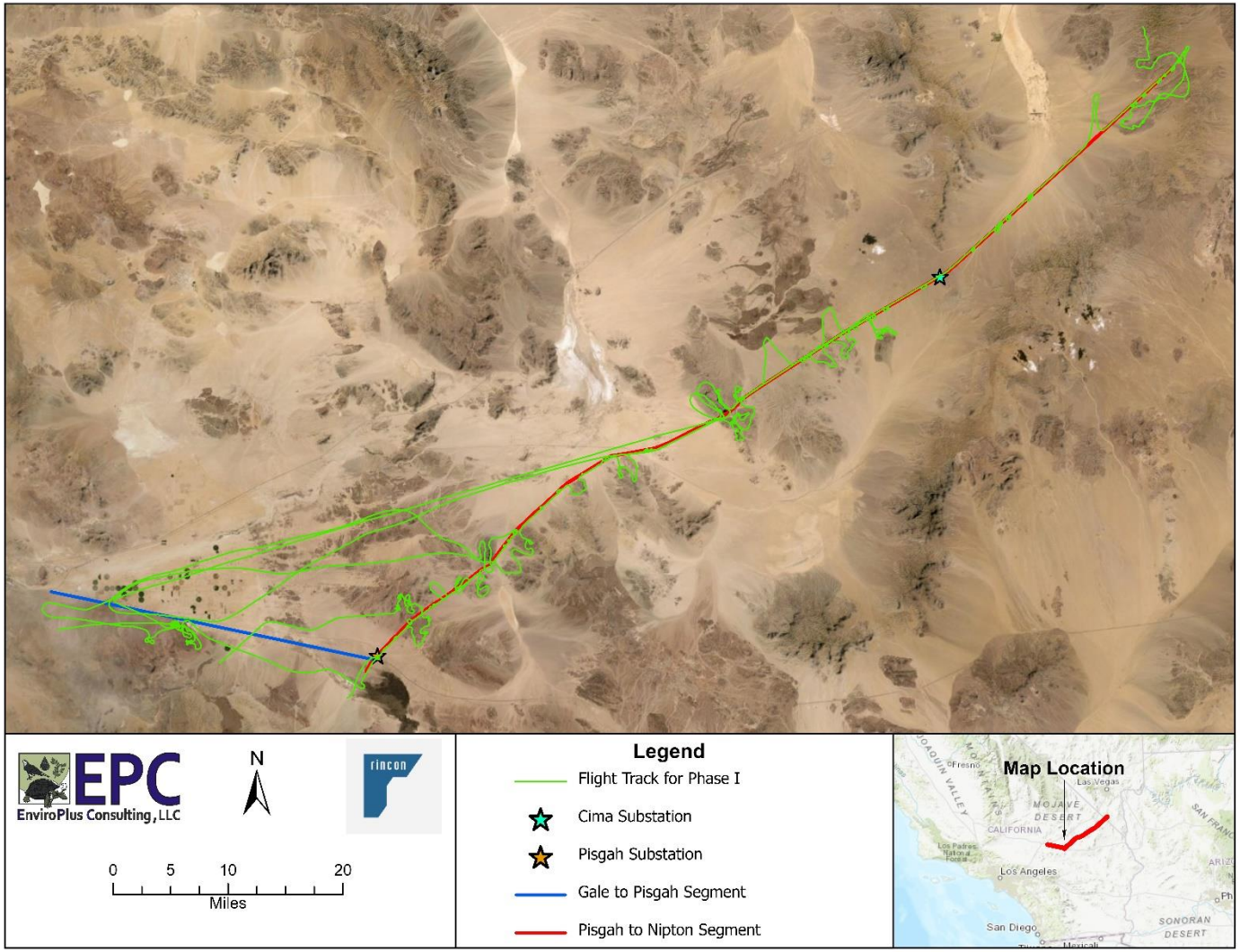

Figure 3. Flight track data (March 22-23, 2021).

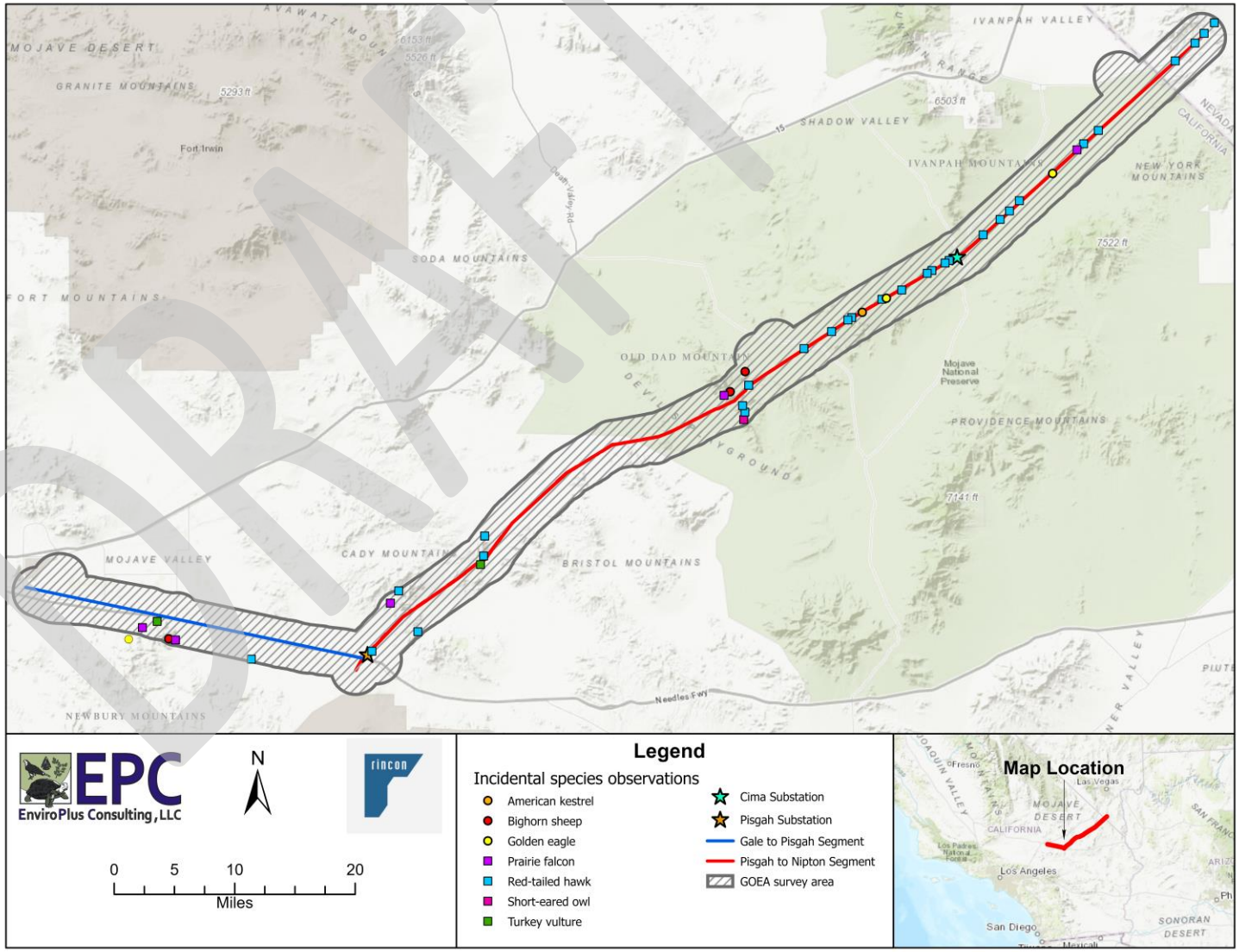

Figure 4. Incidental species observations during Phase 1 occupancy aerial surveys (March 22-23, 2021).

PHOTOGRAPHS

Photograph 1. Female golden eagle incubating eggs or brooding young in the Newberry Mountains nesting territory.

Photograph 2. Active and unoccupied golden eagle nest in the Newberry Mountains nesting territory.

Photograph 3. Inactive and deteriorated golden eagle nest in the Old Dad Mountain nesting territory.

Photograph 4. Pair of golden eagles perched on a transmission structure.

Photograph 5. Adult male golden eagle perched on a transmission structure.

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ATTACHMENT 1 – Summary of Golden Eagle Survey Experience for Eric Dugan, PhD, and Dave Lohr

Eric Dugan, PhD

Dr. Dugan has worked extensively with eagles and other raptors in various capacities over the past 15 years. Specifically, he has conducted protocol-level ground and aerial helicopter surveys for cliff-dwelling raptors and golden eagles (*Aquila chrysaetos*) at various sites across southern California and Nevada. His field efforts have focused on identifying golden eagle nesting territories, assessing nest success and detailing nest ecology at sites associated with solar development and utility projects. Dr. Dugan has conducted the USFWS protocol golden eagle aerial and ground surveys for Southern California Edison's West of Devers Project in 2016, 2017, 2018 and 2019. Additionally, he spent several breeding seasons collecting reproductive data from historical coastal peregrine falcon (*Falco peregrinus*) breeding territories, manning raptor point count stations, and monitoring active raptor nests in California. Dr. Dugan's has first-hand experience with many raptor species, including golden eagle, Cooper's hawk (*Accipiter cooperii*), burrowing owl (*Athene cunicularia*), great-horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*B. lineatus*), American kestrel (*F. sparverius*), and barn owl (*Tyto alba*) during his involvement with mitigation management on natural gas pipeline, renewable energy and transmission line projects. Since 2005, he has served as an agency-approved raptor and avian biologist on projects throughout southern California. Dr. Dugan received his Bachelor of Arts in Environmental Studies from Pitzer College, Claremont Colleges in 2000, and his Ph.D. in Biology from Loma Linda University in 2011. He has an extensive publication record, including several book chapters and numerous scientific journal articles on topics ranging from rattlesnake niche partitioning to lizard ecology. He is actively involved in scientific research, with current projects in both southern California and the Baja Peninsula, Mexico.

Dave Lohr

Mr. Lohr is a life-long field biologist, with over 15 years devoted to the environmental industry. His experiences are highlighted by extensive work on the conservation of herpetofauna and avian species across the southwestern United States and northern Mexico. Mr. Lohr has conducted numerous seasons of protocol-level ground and aerial helicopter surveys for cliff-dwelling raptors and golden eagles (*Aquila chrysaetos*) at sites located in both California and Nevada. He has served as both an observer and photographer during previous protocol eagle surveys including Southern California Edison's West of Devers Project in 2018 and 2019. Mr. Lohr has been an instrumental figure on various research and energy projects ranging from rattlesnake radio-telemetry to avian biology and raptor conservation during the construction of transmission line projects. He has served as a field lead and has conducted thousands of hours of focused surveys for sensitive species, including golden eagle, burrowing owl, desert tortoise, barefoot gecko and nesting birds. His consulting portfolio includes 15 years of implementing compliance and mitigation monitoring programs. Mr. Lohr is an accomplished avian biologist proficient in species identification, handling, data collection, photography, and reporting. Most recently, he has served as an agency-approved avian biologist on Los Angeles Department of Water and Power, Southern California Edison, and Southern California Gas projects across the southwest U.S.

ATTACHMENT 2 - Curriculum vitae for Eric Dugan, Ph.D. and Dave Lohr

Eric A. Dugan, PhD

Doctor of Philosophy, Biology - June 2011
Dissertation Title: Comparative biology of sympatric Red Diamond and Southern Pacific rattlesnakes in Southern California
Loma Linda University, Loma Linda, CA

Bachelor of Arts, Environmental Studies - June 2000
Emphasis - Environmental Health and Policy
Pitzer College, Claremont, CA

SUMMARY

My background is founded on research, biological consulting, and conservation of sensitive flora and fauna, in particular herpetofauna and avian species. These efforts have provided a diverse and broad experience spanning 22 years in the biological consulting field, including work on numerous pipeline and transmission line projects, sensitive species surveys, and project management. I've conducted six seasons of aerial helicopter and ground surveys for golden eagle and am an agency-approved raptor and avian biologist. As part of these efforts, I have conducted over 4,000 hours of avian surveys and mitigation monitoring. As a state and federally permitted Master Falconer, I've trapped, handled, and examined hundreds of raptors. Most recently, I served as the lead avian biologist and subject matter expert for avian mitigation management on a large SCE transmission line project in southern California. Stemming from academic research, I have developed a significant publication record that includes peer-reviewed scientific journals and several book chapters. My 7-year radio-telemetry project on southern Pacific and red diamond rattlesnakes was covered by local media and aired on the Animal Planet series Venom ER. Selected recent projects are provided below.

SELECTED PROJECTS

West of Devers Upgrade Project - Southern California Edison - 2016-present
Lead Avian Biologist and Subject Matter Expert (SME)
Served as the lead avian biologist and SME for all avian mitigation management. Tasks included establishing and managing nest events, wildlife agency and CPUC communication, and review/editing of project-related reporting in the SCE FRED system.
Managed and scheduled a field team of agency approved avian biologists responsible for pre-construction surveys, nest documentation, nest updates, and buffer management.
Golden Eagle Aerial Surveys
Conducted USFWS protocol Phase 1 occupancy, Phase 2 productivity, and aerial tower nest surveys within a 2-mile buffer of the West of Devers Upgrade Project alignment. Surveys methodologies followed the U. S. Fish and Wildlife Service's *Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations.*

Stateline Solar Farm Project - BioResource Consultants - 2017
Golden Eagle Aerial Protocol Surveys
Conducted USFWS protocol Phase 1 occupancy surveys within a 5-mile buffer of the Stateline Solar Farm Project location. Survey methodologies followed the U. S. Fish and Wildlife Service's *Interim Golden Eagle Inventory and Monitoring Protocols; and OtherRecommendations.*
Surveys at nearby historical golden eagle nests in the vicinity of the wind farm were also conducted during these flights.

Lompoc Wind Energy Project - Sapphos Environmental - 2016

Golden Eagle Aerial Surveys

Conducted USFWS protocol Phase 1 occupancy surveys within a 10-mile buffer of the Lompoc Wind Energy Project's proposed location. Surveys methodologies followed the U.S. Fish and Wildlife Service's *Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations.*

San Mateo East Agricultural Field Tree Removal - NAVFAC SW - 2016

Lead Raptor/Avian Biologist

Conducted over 65 hours of ground surveys for nesting raptors and owls. Raptors observed included peregrine falcon, merlin, osprey, red-tailed hawk, cooper's hawk, red- shouldered hawk, and American kestrel. Data was collected on age, sex, and behavior of each individual raptor.

Barren Ridge Renewable Transmission Project – LADWP - 2015-2016

Desert Kit Fox, Desert Tortoise, and Woodrat Biologist

Established and monitored remote camera sites at active desert kit fox natal burrows. Tasks included data collection, photo and behavior interpretation, and reporting.
USFWS Authorized desert tortoise biologist. Monitored power line development in tortoise habitat throughout all phases of construction.

ACU-5 Training Center - Marine Corps Base Camp Pendleton - 2013- 2014

California Gnatcatcher and Vernal Pool Biologist

Provided nest surveys and monitoring for the federally endangered California gnatcatcher during the delineation of vernal pools prior to construction of numerous waters wells. Conducted over 100 hours of field surveys and monitoring during this project.

Devers Palo Verde 2 Project - Southern California Edison - 2012- 2013

Golden Eagle, Raptor, and Nesting Bird Biologist

Conducted numerous helicopter aerial tower nest surveys for golden eagle, red-tailed hawk, and common raven.
Assisted in ground monitoring of an active golden eagle nest. Monitored the behavior, activity patterns, and foraging of an adult pair of eagles raising chicks. Field work and mentoring was performed under eagle biologist Bob Chapman.

Desert Tortoise, Flat-tailed Horned Lizard, and Mohave Fringe-toed Lizard

United States Fish and Wildlife Service and BLM approved biologist for work occurring in critical habitat of endangered species along a 153-mile transmission line.

Sunrise Powerlink Project - San Diego Gas & Electric - 2010- current

Barefoot Banded Gecko Project Lead - CDFG Incidental Take Permit Holder

Field lead and agency contact for all Sunrise Powerlink Project work occurring in habitat of the state threatened barefoot banded gecko (*Coleonyx switaki*). San Diego and Imperial Counties, CA.
Conducted CDFG protocol habitat assessments, pre-construction surveys, construction monitoring, reporting, and monitoring of restoration efforts.
Assisted with surveys for bighorn sheep and cliff dwelling raptors during daily helicopter flights within the approved helicopter buffer. Over 75 helicopter flights were completed.

Raptor and Avian Biologist - NOREAS Inc. - 2012-2016

Golden Eagle Helicopter Nest Surveys - Mojave Desert, CA

-Conducted helicopter surveys for Golden Eagles in the Cady Mountains, Bristol Mountains, and along the northern border of the Marine Corps Air Ground Combat Center.

Served as the second eagle observer for all aerial survey efforts.
-Mentoring and training for these surveys was completed under golden eagle specialist and Senior Scientist, Brian Latta. Mr. Latta provided field training on survey protocols, eagle biology, nesting habitats, and data collection for the 2-day survey effort.
-Surveys included tower nest inventories along nearby transmission lines. Three active golden eagle nests were identified and mapped during the surveys. Chicks were aged and photos were taken of each nest.
-General operations included searching for nests and live eagles, recording data on chicks and nest locations, and mapping known nesting territories. Active nests of cliff-dwelling prairie and peregrine falcon and red-tailed hawk were also noted during the survey.
-Served as the Lead Eagle Biologist during ground reconnaissance and monitoring at the active golden eagle nests. Data was collected on nest status, eagle activity and diet, and chick development.

Peregrine Falcon Nest Surveys - Schuyler Heim Bridge Replacement

-Conduct over 100 hours of surveys at known peregrine falcon nesting territories in the Port of Long Beach. Surveys included locating falcons and nests to document nest status, courtship, hunting, and reproduction.
-Surveys were performed in 4 different nesting territories over a two-year period representing two breeding seasons.

Raptor Point Counts

Field lead during 200-plus hours of raptor point counts along the Colorado River. Raptor observations were noted at three observation points, along with data on behavior, daily activity, and direction of travel. Species observed included golden eagle, cooper's hawk, red-tail hawk, American kestrel, prairie falcon, and turkey vulture.

Migratory Bird Point Counts

-Conducted daily sunrise to sunset surveys and counted, identified, and recorded every bird aurally or visually detected during an 8-hour survey period
-Over 150 hours of field surveys were completed.

SELECTED RESEARCH

Rattlesnake Radio-telemetry Niche Partitioning Project - 2003-2015

-Principle investigator of radio-telemetry research examining niche partitioning among red diamond (*Crotalus ruber*) and southern Pacific (*C. helleri*). Daily tasks ranged from radio- tracking telemetered snakes, collecting all necessary data, processing new and recaptured snakes, and training of field assistants. Handled over 300 individual snakes of age classes.
-Published the results of this research in the books The Biology of Rattlesnakes, The Biology of Rattlesnakes II, and the scientific journal Herpetologica.

Barefoot Banded Gecko Project - 2000-present

-Principal investigator of range-wide field research examining seasonal activity, diet, and distribution of the state listed barefoot gecko (*Coleonyx switaki*).
-This is an International project performed under permits issued by both California and Mexican wildlife agencies. Study sites includes locations throughout the Baja Peninsula and southern California.

Large-billed Savannah Sparrow Ecology and Taxonomy Project

-Assisted in field collecting and mist-netting efforts along the margins of the Salton Sea.
-Monitored nets and assisted with morphological data collection and bird release.
-Field work was performed under permits issues to Loma Linda University and Stacy Peterson.

SELECTED PUBLICATIONS

Dugan, E. A. and W. K. Hayes. 2017. Differential niche use but negligible niche partitioning between the sympatric rattlesnakes *Crotalus ruber* and *C. oreganus helleri* in southern California. *In* Dreslik, M. J., W. K. Hayes, S. J. Beaupre, and S. P. Mackessy (Eds.), *The Biology of Rattlesnakes II*. Eco Publishing, Rodeo, New Mexico

Dugan, E. A. and W. K. Hayes. 2012. Diet and feeding ecology of the Red Diamond Rattlesnake. *Crotalus ruber* (Serpentes:Viperidae). Herpetologica 68(2):203-217.

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SPECIALIZED TRAINING AND CERTIFICATIONS

-CDFW Scientific Collecting Permit and MOU holder (current)
-FWS and CDFW Licensed Falconer (2009 - 2013)
Active falconer with experience trapping and flying red-tailed, cooper's, and harris hawks. Additional experience with golden eagle, northern goshawks, and various falcons.
-Flat-tailed Horned Lizard Workshop (2008)
Authorized by California Department of Fish and Game to take, possess and transport flat- tailed horned lizards.
-Introduction to Desert Tortoise Surveying, Monitoring and Handling Workshop (2000)
Participant in the Desert Tortoise Council Workshop, Ridgecrest, CA
-Arroyo Toad Monitoring and Surveying Workshop (2000)

Dave Lohr

PROFESSIONAL EXPERIENCE

Mr. Lohr is a life-long field biologist, with over 15 years devoted to the environmental industry. His experiences are highlighted by extensive work on the conservation of herpetofauna and avian species across the southwestern United States and northern Mexico. Mr. Lohr has served as an instrumental component on various research and energy projects ranging from rattlesnake radio-telemetry to avian biology and raptor conservation during the construction of transmission line projects. He has served as a field lead on numerous projects and has conducted thousands of hours of focused surveys for sensitive species, including golden eagle, burrowing owl, desert tortoise, barefoot gecko and nesting birds. His consulting portfolio includes 15 years of implementing compliance and mitigation monitoring programs. Mr. Lohr is an accomplished avian biologist proficient in species identification, handling, data collection, photography and reporting. He served as an avian biologist most recently on LADWP, SCE, and SCG projects across the southwest U.S.

LICENSES/CERTIFICATIONS

Mr. Lohr is recognized as an approved desert tortoise (CDFW ITP # 2081-2012-039-04) and bighorn sheep monitor, and holds qualifications for flat-tailed horned lizard, Wood turtle, and barefoot banded gecko (SCP#005172). Additionally, he was authorized by NJDEP (NJFW Permit No SC 2013131) to monitor and relocate the endangered timber rattlesnake and northern copperhead in conjunction with several pipeline projects in northern New Jersey. Mr. Lohr is also an accomplished agency approved avian and raptor biologist.

TRAINING

- 2013 – Trained and certified in the utilization of OHV for the purpose of conducting surveys and monitoring. Ringwood State Park, NJ.
- 2012 – Flat-tailed horned lizard workshop. Authorized by Department of Fish and Game to take, possess, and transport flat-tailed horned lizards. SDG&E
- 2011 – Quino checkerspot butterfly workshop. Topics covered included identification of both adult and larval stages, habitat and plant associations, seasonal activity, and species-specific distribution. Alpine, CA.
- 2011 - Desert Tortoise Council 20th Annual Workshop: Surveying, monitoring, and handling techniques workshop. Ridgecrest, CA.

PROFESSIONAL AFFILIATIONS

- Orianne Society, 2013 - present
- San Diego Herpetological Society, 2012 - present

PROJECTS

West of Devers Upgrade Project, SCE, Riverside and San Bernardino Counties, CA, 2018-2019: Served as an agency approved avian biologist for the project. Monitored numerous active migratory and raptor nests including golden eagle (*Aquila chrysaetos*) to determine activity levels and nest status. Provided a status update of each nest and documented the phenology of fledge dates and nest success/failure data. Conducted protocol aerial and ground surveys for golden eagle (*A. chrysaetos*) and other cliff dwelling raptors.

Gemini Solar Project, Dugan Biological Services, North Las Vegas, NV 2017: Provided protocol aerial and ground surveys for golden eagle (*A. chrysaetos*) and other cliff dwelling raptors. Aerial surveys documented active nests of golden eagle (*A. chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), common raven (*Corvus corax*), and falcon species *(Falco sp*.). Ground surveys provided data on fledglings and nest productivity.

L3000 Post ILI Segment Replacement Project, SoCalGas, San Bernardino County, CA, 2017/2018: Provided clearance surveys and monitored segment replacement of natural gas transmission line, spanning over 30 miles through desert tortoise (*Gopherus agassizii*) habitat. Observed and reported on special status species, including desert tortoise, desert kit fox (*Vulpes macrotis*), prairie falcon (*Falco mexicanus*), and loggerhead shrike *(Lanius ludovicianus*).

Barren Ridge Renewable Transmission Project, LADWP, Kern and LA Counties, CA, 2016: Provided clearance surveys and monitored construction of transmission line, spanning over 20 miles through desert tortoise (*Gopherus agassizii*) habitat. Observed and reported on bird/raptor nests to determine activity level and provided status updates. Observed and provided updates on nesting birds, including golden eagle (*A. chrysaetos*), burrowing owls (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*B. jamaicensis*), ferruginous hawk (*B. regalis*), rough-legged hawk (*B. lagopus*), loggerhead shrike (*Lanius ludovicianus*), prairie falcon (*Falco mexicanus*), merlin (*F. columbarius*)

North-South Gas Pipeline Project, Southern California Gas Co, Riverside County, CA, 2015: Conducted protocol surveys for burrowing owl (*A. cunicularia*) as well as desert kit fox (*V. macrotis*). Conducted nesting bird surveys.

Beacon Solar Project, LADWP, Kern County, CA, 2015: Provided clearance surveys, monitored construction of solar field and relocated non-sensitive species from impact areas. Performed burrow excavation of potential desert tortoise (*G. agassizii*) burrows. Daily surveys focused on observations of migratory birds, including long-eared owl (*Asio otus*) and prairie falcon (*F. mexicanus*).

Aliso Canyon Turbine Replacement Project, Southern California Gas Co, Porter Ranch, CA, 2014: Served as an approved avian biologist for this project. Monitored numerous active nests (passerine/raptor) to determine activity level and nest status. Provided a status update of each nest and documented the phenology of fledge dates and nest success/failure data.

Valley South Subtransmission Project, So Cal Edison, Murrieta, CA, 2014: Conducted protocol surveys for burrowing owl (*A. cunicularia*). Provided species lists and field data for the final report.

Desert Bighorn Sheep Guzzler Project, MCAGCC, 29 Palms, CA, 2014: Assisted with detailed floristic surveys using the Releve method and field verification of GIS morning parameters for desert bighorn sheep (*Ovis canadensis nelsoni*).

Tehachapi Renewable Transmission Project (TRTP), SCE, Los Angeles and Orange Counties, CA, 2014: Served as an approved avian biologist for the project. Monitored numerous active nests (passerine/raptor) to determine activity levels and nest status. Provided a status update of each nest and documented the phenology of fledge dates and nest success/failure data.

Tennessee Gas Pipeline Project Northeast Upgrade Project (TGP NEUP), Tennessee Gas Co, Sussex, Passaic and Bergen Counties, NJ, 2013: Held Scientific Collecting Permit for handling and relocating timber rattlesnake (*Crotalus h. horridus*), northern copperhead (*Agkistrodon contortrix*) and wood turtle (*Glyptemys insculpa*). Provided clearance surveys, collection and relocation, and monitored construction of gas pipeline throughout three counties.

El Dorado Ivanpah Transmission Project (EITP), So Cal Edison, San Bernardino County, CA and Clark County, NV, 2013: Approved desert bighorn sheep (*O. c. nelsoni*) and desert tortoise (*G. agassizii*) monitor. Provided protocol surveys, clearance surveys, and construction and environmental monitoring throughout the project.

Golden Eagle Project, Noreas Environmental, San Bernardino County, CA, 2012: Conducted ground visits to active golden eagle (*Aquila chrysaetos*) nests to determine productivity. Observed nest-dependent fledglings in the vicinity of the nests. Provide a summary report verifying status of the nest and fledge or failure data.

SDG&E Sunrise Powerlink Project, SDG&E, San Diego and Imperial Counties, CA, 2012: Provided protocol surveys, clearance surveys, construction and environmental monitoring throughout the project. CDFG approved barefoot banded gecko (*Coleonyx switaki*) biologist.