URS

September 26, 2012

Pierre Martinez
Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Subject: Applicant's Spring 2012 Migratory Bird Survey Summary Report
Rio Mesa Solar Electric Generating Facility (11-AFC-04)

Dear Mr. Martinez:

On behalf of Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC, collectively the "Applicant" for the Rio Mesa Solar Electric Generating Facility project ("Rio Mesa SEGF"), we submit the Applicant's Spring 2012 Migratory Bird Survey Summary Report.

Sincerely,

Angela Leiba, Vice President
Senior Project Manager/ Environmental Department Manager

Enclosure

cc: POS List
Project File

F I N A L

SPRING 2012 MIGRATORY BIRD SURVEY SUMMARY REPORT FOR THE RIO MESA SOLAR ELECTRIC GENERATING FACILITY, RIVERSIDE COUNTY, CALIFORNIA

Prepared for

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URS Project No. 27652103

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BCC	Birds of Conservation Concern (USFWS)
BLM	Bureau of Land Management
BSA	Biological Study Area
CDFG	California Department of Fish and Game
CNDDB	California Natural Diversity Database
FP	Fully Protected (CDFG)
Gen-tie line	Generator tie-line
GIS	Geographic Information System
GPS	Global Positioning System
HMANA	Hawk Migration Association of North America Field
MWD	Metropolitan Water District
NOAA	The National Oceanic and Atmospheric Administration
Rio Mesa SEGF	Rio Mesa Solar Electric Generating Facility
REAT	Renewable Energy Action Team
SE	State Endangered (California Endangered Species Act)
ST	State Threatened (California Endangered Species Act)
SSC	Species of Special Concern (CDFG)
USFWS	U.S. Fish and Wildlife Service
WL	Watch List (CDFG)

SECTION 1 INTRODUCTION

1.1 PURPOSE OF REPORT

This quarterly report describes the methodology and results of spring 2012 migratory bird surveys at the Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF or Project). The purposes of the migratory bird surveys are threefold:

- To determine the scope and scale of migratory bird use;
- To determine potential direct, indirect, and cumulative impacts on migratory birds that may result from construction and long-term operation of the Project for California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) analysis; and
- To record observed avian migration and use patterns at and near the project site for use in avian risk characterization associated with a Bird and Bat Conservation Strategy (formerly known as Avian and Bat Protection Plan) and Eagle Conservation Plan (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012).

The Renewable Energy Action Team (REAT), consisting of the United States Fish and Wildlife Service (USFWS), the California Department of Fish and Game (CDFG), the Bureau of Land Management (BLM), and the California Energy Commission (CEC), recommended that a second year of migratory bird surveys be conducted at Rio Mesa SEGF (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012). The expanded spring 2012 bird surveys, prepared at the REAT's request, consisted of (1) fixed-point observation counts; (2) transect point counts; and (3) nocturnal radar monitoring following REAT methodology. All three surveys will occur again during the fall 2012 migration period and a final report will follow. In addition, focused surveys for Gila Woodpecker (*Melanerpes uropygialis*), Elf Owl (*Micrathene whitneyi*), and other breeding birds occurred in the microphyll woodlands in the vicinity of the project site during spring 2012, and separate reports were developed describing the methodology and results from these surveys.

The 2011 and 2012 Rio Mesa SEGF avian data have documented the seasonal movements of passerines, raptors and waterbirds in the Lower Colorado River corridor and detected a total of 130 species in or near the Project. Eighty-three of these species were detected during 2011 surveys (7 of which were only detected during 2011) and 123 species were detected during 2012 surveys (47 of which were only detected during 2012). Inter-annual differences reflect such factors as fluctuations in avian populations, migration routes, weather patterns and events, survey methodologies, survey level of effort, or some combination of these factors. Appendix G of this report includes a spring 2012 nocturnal radar study. Nocturnal passage rates detected in the radar study were also consistent with avian use of the Lower Colorado River corridor. State or federally listed threatened or endangered California fully protected avian species that have been detected in the Project surveys are described in more detail in Section 4 of this report and include the following:

1.1.1 Bank Swallow (Riparia riparia)

A total of 19 bank swallows (CDFG: State Threatened [ST]) were observed onsite during the spring 2012 surveys, including one flock of 15 individuals on April 2, 2012 and two flocks of two individuals on April 14, 2012. The dates of these observations are consistent with the expected peak of spring migration for this species though the vicinity of the project area. In California, the Bank Swallow is a locally common to uncommon breeding season resident restricted to northern and central California. Bank Swallows nest exclusively in fresh banks or earthen walls cut by moving water, usually at lower elevations. No suitable nesting habitat is present in or around the project site and no breeding activity is expected onsite. Observations at the project site were transients/migrants, only spending limited time onsite.

1.1.2 Elf Owl (Micrathene whitneyi)

Elf Owls (CDFG: State Endangered [SE]) are associated with riparian or floodplain woodland habitats as well as sub-tropical thornscrub, and less frequently mesquite bosques throughout the southwestern United States and northwestern Mexico. Microphyll woodlands within the project area are largely arid in character and lack the density and size of trees that typically support Elf Owls. Focused surveys for this species detected two individuals within the project area on April 15, 2012 within approximately 500 meters (m) of each other. Follow up surveys did not result in any additional detections. Based on the timing of the detections, the relatively low quality of the habitat (especially considering the availability of suitable nesting habitat in other locations throughout the region) and the lack of subsequent detections, the detections likely represent northbound migrants. Brief migratory stopover may occur within or near the Project area but breeding is not expected to occur.

1.1.3 Gila Woodpecker (Melanerpes uropygialis)

Gila Woodpeckers (CDFG: SE) are year-round residents of the riparian woodland habitats associated with the Lower Colorado River. Five Gila Woodpeckers were observed in 2011 and none were detected during 2012. No suitable nesting habitat is present in or around the project site and no breeding activity is expected onsite. Observations at the project site were transients/migrants, only spending limited time onsite.

1.1.4 Golden Eagle (Aquila chrysaetos)

Golden Eagles (CDFG: Fully Protected [FP]) inhabit a wide range of open habitats across western North America. Two Golden Eagles were observed flying over the project area in 2011 and one was observed north of the project area being attacked by other birds during 2012. Focused Golden Eagle nest surveys within 10 miles of the Project were conducted by the Wildlife Research Institute in 2011 and Bloom Biological, in 2012. The 2011 survey identified three potentially inactive Golden Eagle nests to the far south of the Project area; these were not confirmed in the 2012 survey and two of the nests were found to be occupied by Red-tailed Hawks. The lack of confirmed Golden Eagle nests within 10 miles of the Project indicates that this species likely occurs at very low densities in the vicinity of the Project and that eagles associated with nests well outside the project area may occasionally forage in or around the project area.

1.1.5 Peregrine Falcon (Falco peregrinus)

Peregrine Falcons (CDFG: FP) are widely distributed across North America and occur in a variety of habitats. One Peregrine Falcon was observed during 2011and nine were observed during 2012. Suitable cliff nesting habitat is not present within the project area, and the species appears to occasionally use the project area for foraging.

1.1.6 Sandhill Crane (Grus canadensis)

Sandhill Cranes (CDFG: ST and FP) occur in California and prefer open shortgrass plains, grain fields, and open wetlands. Thirty-four Sandhill Cranes were observed flying over active agricultural lands 4,800-8,000 m east of the project area during 2012. No Sandhill Cranes were observed in 2011. The project area does not contain suitable habitat for this species and the agricultural fields to the east represent preferred wintering habitat. Sandhill Cranes may occasionally traverse near the project area when travelling to foraging areas or while migrating and are unlikely to occur within the project area.

1.1.7 Swainson's Hawk (Buteo swainsoni)

The Swainson's Hawk (CDFG: ST) is a migratory species associated with grasslands and agricultural habitats and is not known to breed in the vicinity of the Project. One Swainson's Hawk was observed in 2011 and 64 were observed in 2012. The inter-annual results likely reflect survey methodologies, annual variance in population numbers, and migration timing routes. Swainson's Hawk migration is expected to occur in and around the Project on an annual basis with annual variation in the magnitude of this migration. The species is unlikely to use the project area due to the lack of preferred habitat and would instead be likely to use the agricultural areas to the east during migratory stop overs.

1.1.8 Willow Flycatcher (Empidonax traillii)

The Willow Flycatcher (CDFG: SE) is known to migrate through southern California, with the most common migrant in the Lower Colorado River Valley being *E. t. brewsteri*. Willow Flycatchers require riparian habitat with willow (*Salix* spp.) thickets for breeding. Suitable nesting and breeding habitat for the species does not occur within the Project area, although microphyll woodlands can provide foraging habitat. Four Willow Flycatchers were observed in 2012. Based on the lack of suitable breeding habitat for this species, as well as the fact that these birds were not observed in the Project vicinity for more than 1-2 days, these Willow Flycatcher observations likely represent migrant individuals. As discussed in Section 4, the detections were not identified to a subspecies level.

1.2 PROJECT DESCRIPTION

The Rio Mesa SEGF is located on the east side of the Mule Mountains approximately 13 miles southwest of Blythe, California (Figure 1). The project site is within the Colorado Desert region of the Sonoran Desert on the Palo Verde Mesa in Riverside County, California. The majority of the project site is on private lands owned by the Metropolitan Water District of Southern California (MWD). Portions of the gen-tie line, secondary access road, and 33kV construction/emergency backup power supply line are located on public lands administered by the BLM.

When the migratory bird surveys initiated, the Project included three solar concentrating thermal power plants each requiring about 1,850 acres (2.9 square miles). The project scope has subsequently changed to include two power plants, eliminating a large portion of the proposed project area and reducing the fenced boundary of the project area to 3,805 acres.

SECTION 2 METHODOLOGY

2.1 SPRING 2012 FIXED-POINT OBSERVATION COUNTS

Following recommendations from the REAT (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012), qualified biologists conducted surveys for all species of birds from seven fixed-point observation stations (four stations focused on non-raptors and three stations focused on raptors). The fixed-point observation counts were used to complement the transect point count surveys with information concerning migratory bird activity and flyover events at higher elevations. Two of the seven fixed-point observation stations were located at each of the Project's two proposed tower locations and two stations offered a complete view of the agricultural lands to the east of the site. See Figure 2 for fixed-point observation locations.

2.1.1 Non-Raptor Fixed-Point Observation Counts

Following recommendations from the REAT (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012), four fixed-point observation stations were focused on non-raptors. These stations were located in areas that allowed a wide expanse of observation area from a single point while also being in areas with high potential for bird activity (e.g., adjacent to microphyll woodlands and areas with higher vegetation density). Stations were operated for three consecutive days each week, eight hours a day, between February 21, 2012 and May 31, 2012.

Surveys were performed under weather conditions with good visibility for detecting birds. Surveys were canceled during periods of sustained precipitation or fog, winds above 20 mph, and when temperature exceeded 105 degrees Fahrenheit (°F). To reduce sampling bias, the survey encompassed midday hours and captured bird activity during times of highest activity (sunrise and sunset), the eight-hour observation periods were alternated between mornings (8 hours after sunrise) and evenings (8 hours before sunset). The rotation schedule consisted of switching one day each week, for example: Week 1: sunset, sunset, sunrise; Week 2: sunset, sunrise, sunrise; Week 3; sunset, sunset, sunrise. The final 2 weeks (May 21 through May 31) of surveys were all conducted in the morning hours because mid-day and late afternoon temperature forecasts were in excess of 105°F and significantly more bird activity was observed in the morning than in the afternoon and evening. For a complete list of survey dates and times, see Appendix A.

Each fixed-point observation station was surveyed by one qualified biologist per day. To reduce sampling bias, biologists were assigned to different locations on different days. During the start and end of each observation period, the time, temperature, cloud cover, and wind speed were recorded on data sheets (Appendix B). Although the focus of these counts was to capture migratory non-raptor bird activity, biologists scanned the sky and surrounding area recording all species of birds, including raptors, observed in flight or non-flight at any distance from the Project fence line. Information collected, following recommendations from the REAT (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012), included: species, observation method (audio/visual), estimated distance from point, number of individuals, flight direction, estimated flight height, and information on the behavior of the bird (Appendix B).

Raptor Fixed-Point Observation Counts

To gather data on raptor migration through and near the project site, qualified raptor biologists monitored raptor migration from three established raptor fixed-point observation stations for eight hours a day, four days a week, between March 6 and April 30. They followed a methodology based on the Hawk Migration Association of North America Field Survey Technique (HMANA 2010) and recommendations from REAT (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012). For a complete list of survey dates and times, see Appendix C.

Raptor fixed-point observation stations, per the REAT's request (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012), were separated by at least two miles and located in areas that allowed observation of a wide expanse from a single point, away from public view as much as possible, and where topographic and biological features, such as cliffs, rock outcrops, knolls, rivers, and food sources, were likely to be used by raptors during migration.

Each fixed-point observation station was surveyed by one qualified biologist per day. Monitoring was performed under good weather conditions (no sustained precipitation or fog, low to moderate wind speeds, and temperature below 105°F). To reduce sampling bias, biologists were assigned to different locations on different days. Initially, surveys were proposed to start at 9:00 AM and end at 5:00 PM per REAT recommendations (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012). However, based on preliminary data, the HMANA (2010) protocol and the survey team's experience with raptor surveys (including Dr. Eric Dugan, Brian Latta, John Sterling and Brian Williams) the survey team concluded that the early morning hours provided the best opportunity to observe and document raptors. Preliminary data suggested that the highest bird activity hours were between 6:00 AM and 9:00 AM. A survey period extending from 9:00 AM to 5:00 PM would therefore reduce the extent to which raptors would have been observed (personal communication with Dr. Eric Dugan). Therefore, the raptor surveys started at sunrise and lasted for 8 hours.

The time, temperature, cloud cover, and wind speed were recorded on data sheets at the start and end of each survey period (Appendix D). Although the focus of these counts was to capture migratory raptor activity, biologists scanned the sky and surrounding area recording all species of birds, including non-raptors, observed in flight or non-flight at any distance. Information collected, following recommendations from the REAT (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012), included: species, observation method (audio/visual), estimated distance from point, number of individuals, flight direction, estimated flight height, and information on the behavior of the bird (Appendix D).

2.2 SPRING 2012 TRANSECT POINT COUNTS

A total of 16 transects with eight observation points per transect (Figure 3) were established at the Rio Mesa SEGF site following the methodology from Ralph et al. 1995, Bibby et al. 2000, the 2009 BLM Solar Facility Point Count Protocol, and recommendations from REAT (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012). Collectively, these sources recommended locating:

- One transect per square mile (project site was roughly 16 square miles at time of survey design)

- Eight point count locations per transect (each point spaced 250 mapart).

Specific transect locations were chosen based on habitat characteristics where the highest density of avian species was likely to occur (e.g., microphyll woodland washes and areas with higher concentrations of vegetation). Out of 128 total survey points, 58 (45 percent) were located within microphyll woodland, and an additional 36 (28 percent) were located within 100 m of microphyll woodland. Additionally, 86 (67 percent) points were located outside of the Project fence line and 42 (33 percent) were located within the Project fence line (Figure 3).

Following recommendations from the REAT (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012) these transect locations were surveyed for all bird species on a weekly basis from April 24 – May 26, 2012 by qualified biologists. Surveys started at sunrise and ended no later than 11:00 AM or when temperature exceeded 90°F at the start of the transect. At most, biologists were able to survey two transects per day. A transect was not started if it was not possible to complete all eight points in a single day. To reduce sampling bias where possible, the starting end of each transect was alternated. When a transect was surveyed as the second transect of the morning one week, it was surveyed first the next week. Additionally, biologists were assigned to different transects each week so each transect was surveyed by multiple biologists. For a complete list of survey dates and times, see Appendix E.

Transects were surveyed by one qualified biologist per transect, with the exception of five days when transects were surveyed as a group of two. During the start and end of each transect the time, temperature, cloud cover, and wind speed were recorded on data sheets (Appendix F). Biologists began the survey at one end of the transect on the first point and surveyed systematically through the eight points in a transect in numerical order (recording any incidental sightings observed during transit between survey points). At each point, ten minutes were spent passively surveying for birds. All birds seen or heard at unlimited distance from the point were recorded. Information collected included: species, observation method (audio/visual), estimated distance from point, number of individuals, flight direction, estimated flight height, and information on the behavior of the bird (Appendix F).

2.3 SPRING 2012 RADAR MONITORING

URS contracted Western EcoSystems Technology, Inc. to complete nocturnal migration radar monitoring of birds and bats during the 2012 spring and fall migration periods following the Gauthreaux and Belser (2005) methodology recommended by the REAT (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012). For a complete report on the methodology and results from the spring monitoring effort, see Appendix G.

SECTION 3 BIOLOGISTS' QUALIFICATIONS

Biologists' qualification criteria are listed below and resumes can be found in Appendix H.

For non-raptor observation points and transects, qualified biologists have a Bachelor of Science or higher in avian biology/ornithology, prior experience conducting surveys for migratory bird species likely to occur in the project area, and the ability to identify birds visually while in flight as well as by their call. For experienced birders with a degree in biology but not avian biology/ornithology, a greater degree of experience in relevant field work was required.

For raptor observation points, qualified biologists have a Bachelor of Science or higher in avian biology/ornithology/raptor ecology, prior experience with hawk migration counts, prior experience with raptor species likely to occur in or near the project area, and demonstrated ability to identify birds visually while in flight as well as by their call; for raptor specialists with a degree in biology but not avian biology/ornithology, a greater degree of experience in relevant field work was required.

SECTION 4 RESULTS

4.1 SPRING 2012 FIXED-POINT OBSERVATION COUNTS AND TRANSECT POINT COUNTS

4.1.1 Species Diversity and Abundance

Fixed-Point Observation Counts

A total of 22,584 observations (average of 305.2 observations per survey day) consisting of 114 species were made during the Spring 2012 fixed-point observation counts (Table 1). At the non-raptor fixed points, a total of 14,187 observations (average of 330 observations per day) consisting of 103 species were made (Table 1). At the raptor fixed points, a total of 8,397 observations (average of 271 observations per day) consisting of 78 species were made (Table 1). These results do not include 1,782 observations from all locations that could not be identified at a species level due to factors such as bird size, brevity of observation, or distance.

Over half of all observations (52 percent) occurred at fixed points 3B and 3R (Table 1 and Figure 2), which are the two fixed points closest to the agricultural fields located to the east of the project site. Additionally, the average number of observations per day was highest at these two fixed points (Table 1). As discussed below, the irrigated agricultural fields are used by a greater number and diversity of avian species than the desert mesa habitat characteristic of the project site, and observation points located near the fields therefore recorded a larger proportion of the total observations in the Spring 2012 surveys. The two fixed points closest to the proposed tower locations (points 2R and 4B; see Figure 2) accounted for approximately 14 percent of all observations and low average numbers of observations per day were recorded at these locations (Table 1).

The most frequently observed species were Turkey Vulture, (6,283 observations), Yellow-headed Blackbird (2,620 observations), Red-winged Blackbird (1,749 observations), Tree Swallow (1,212 observations) and White-faced Ibis (1,163 observations) (Table 1). As a group, passerines were the most commonly observed species and accounted for 55 percent of all observations (12,393 observations). Raptors accounted for 31 percent of all observations (7,030 observations), non-passerines accounted for Eight percent of all observations (1,787 observations) and waterbirds accounted for 6 percent of all observations (1,374 observations) (Table 1).

Transect Point Counts

A total of 4,305 observations (average of 718 observations per survey day) consisting of 73 species were made during spring 2012 bird transect point counts (Table 2). These results do not include 1,782 observations from all locations that could not be identified at a species level due to factors such as bird size, brevity of observation, or distance.

Transect points located outside of the current Project fence line (Figure 3) accounted for 76.6 percent of all observations. A higher average number of observations per day (6.45 observations per point) was

documented outside the Project fence line than inside the fence line (4.57 observations per point) (Table 2, Figure 3, Figure 4).

The most frequently observed species were Mourning Dove (877 observations), Ash-throated Flycatcher (474 observations), Verdin (observations 414), Red-winged Blackbird (390 observations), and White-winged Dove (388 observations) (Table 2). Passerines were the most commonly occurring species and accounted for 61.5 percent of all observations (2,647 observations). Non-passerines accounted for 33 percent of all observations (1,439 observations), raptors accounted for 4 percent of all observations (158 observations), and waterbirds accounted for 1 percent of all observations (61 observations) (Table 2).

4.1.2 Habitat Use

Agricultural/Riparian Habitat Use

The relative propensity of observed avian species to use the desert mesa habitat characteristic of the Project site and the irrigated agricultural/riparian habitat to the east was assessed by analyzing the observational data from the two fixed-points (3B and 3R Figure 2) and two transects (N1-8 and O1-8 Figure 3) located on the eastern portion of the survey area and that provided the most unrestricted views of both the project site and the offsite agricultural/riparian habitat areas to the east. All avian observations that were documented to the northeast, east and southeast of these observations points were considered to be associated with the agricultural/riparian habitats located east of the project site. Observations at all other directions were considered to be associated with project site habitats. The results of the analysis demonstrated that a significantly higher percentage of the observations were associated with the offsite agricultural/riparian habitats (71.5 percent) in contrast with the project site (28.5 percent) (chi-square = 2153.026, p-value < 0.01). There were 41 species for which documented sample sizes at the eastern observation points (n = 20 or greater) were sufficient to statistically analyze habitat preferences. (Table 3). Twenty of these species exhibited a statistically significant association (p-values < 0.05) with the offsite agricultural/riparian habitat. Five species exhibited a statistically significant association with the desert mesa habitat characteristic of the project site, and 16 species had no significant association with either habitat (Table 3).

Microphyll Woodland Habitat Use

The relative propensity of observed avian species to use the desert uplands, microphyll woodlands and transitional areas located 100 m from microphyll woodlands within the desert mesa habitat characteristic of the Project site was assessed by analyzing the observational non-flyover data recorded within 0-100 m of each transect point using a Kruskal-Wallis one way analysis of variance on ranks, multiple comparison procedure (Dunn's Method) at the 95 percent confidence interval. Non-flyover observations included birds observed hunting, foraging, perching, or breeding. Flyovers and observations over 100 m from the point were not used in the analysis because they could not be associated with specific habitats. Prior to field work, all transect points were classified as either desert upland, microphyll woodland or adjacent transitional area (100 m from microphyll woodland) using GIS/GPS software and these classifications were confirmed in the field during the surveys. The results of the analysis demonstrated that a significantly higher percentage of the observations, and higher numbers of observations and species, were

associated with microphyll woodlands compared with desert upland habitats(Table 4, Figure 4, and Figure 4b).

4.1.3 Flight Height and Direction

Flight height and direction for each observation documented at fixed-point and transect point count locations were estimated and recorded on data sheets. Estimated flight heights ranged from 0.5 to 2000 m and averaged 31.33 m (Table 5). Average flight heights for waterbirds was 89.6 m, 76.9 m for raptors, 16.9 m for non-passerines, and 15.2 m for passerines (Table 5).

4.1.4 Flocking Species

Flocking individuals were not commonly encountered during fixed-point observation counts or transect point counts (Table 6). Flocks were classified as non-flocks (1-5 individuals), small flocks (6-50 individuals) and large flocks (51-500 individuals). Non-flocks accounted for 94.2 percent of observations, small flocks accounted for 5.4 percent of all observations and large flocks accounted for 0.4 percent of all observations. The most common flocking species were Turkey Vulture (*Cathartes aura*), Red-winged Blackbird (*Agelaius phoeniceus*), Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), Cliff Swallow (*Petrochelidon pyrrhonota*) and Tree Swallow (*Tachycineta bicolor*) (Table 6).

The species in large flocks (51-500 individuals) included Brewer's Blackbird, Double-crested Cormorant, European Starling, Red-winged Blackbird, Tree Swallow, Turkey Vulture, White-faced Ibis and Yellow-headed Blackbird (Table 7). Figure 5 shows the approximate locations of the large flocks observed during the surveys. All but two large flocks (turkey vulture and red-winged blackbird) were observed outside the Project fence line, and most commonly over the agricultural fields to the east (Figure 5).

4.1.5 Sensitive Species

During spring 2012 fixed-point observation counts and transect point counts, a total of 28 special status species were observed (Table 7). No federally-listed threatened or endangered species were observed. One state-endangered species was observed (Willow Flycatcher) and three state-threatened species were observed (Sandhill Crane, Swainson's Hawk, Bank Swallow). Three state fully-protected species (Sandhill Crane, Golden Eagle, and Peregrine Falcon) were also observed (Table 7). Figure 6 shows the approximate locations of these observations during the surveys.

Willow Flycatcher (CDFG: SE-all subspecies, USFWS: Birds of Conservation Concern [BCC])

A total of four Willow Flycatcher observations were made (Table 7 and Figure 6). All subspecies of Willow Flycatcher are listed as state endangered birds. The observations could not be identified to a subspecies level because of the lack of applicable vocalizations that differentiate separate subspecies. All Willow Flycatcher observations were outside of the Project fence line (Figure 6). The first Willow Flycatcher observation was made on April 17, 2012 during non-raptor fixed-point observation counts and was a single individual observed foraging in microphyll woodlands approximately 250 m northeast of fixed-point 1B (Figure 6 and Figure 2). The second observation was made on May 24, 2012 during non-raptor fixed-point observation counts and was a single individual heard vocalizing approximately 250 m southeast of fixed-point 3B (Figure 6 and Figure 2). Two Willow Flycatcher observations occurred on

May 25, 2012 during transect point counts. One individual was seen foraging at point F8 and a second was heard vocalizing at point O8 (Figure 6 and Figure 3).

Sandhill Crane (CDFG: ST, FP)

A total of 34 Sandhill Crane observations were made and consisted of small flocks over the agricultural fields to the east of the Project site (Table 7 and Figure 6). Sandhill Crane was observed on February 21, 2012 during fixed-point observation counts in two flocks of 7 and 3 individuals located between 6,000-8,000 m east of point 3B (Figure 2 and Figure 6). A second flock of 24 individuals was observed 4,800 m east of fixed-point 1B on February 23, 2012 (Figure 2 and Figure 6).

Swainson's Hawk (CDFG: ST; USFWS: BCC)

There were 64 Swainson's Hawk observations during the fixed-point observation counts. No Swainson's Hawks were observed during the transect surveys (Table 7 and Figure 6). Swainson's Hawks were predominantly observed flying over the agricultural fields (approximately 42 of the observations) to the east and also over the project site (7 observations (Figure 6). A total of 18 Swainson's Hawk observations were made during the non-raptor fixed-point counts (Table 7). All non-raptor point fixed-point observations were single individuals in flight or 2 individuals flying together during a single observation on April 5, 2012 from point 3B (Figure 2 and Figure 6). There were 46 observations during the raptor fixed-point counts (Table 7). All Swainson's Hawk observations at raptor fixed-point observation counts were single migrating individuals with the exception of two migrating individuals observed on April 8, 2012, three migrating individuals observed on April 9, 2012, four migrating individuals observed on April 9, 2012, and 14 migrating individuals observed on April 8, 2012 (Figure 2 and Figure 6).

Bank Swallow (CDFG: ST)

There were 19 Bank Swallow observations detected during the raptor fixed-point counts within the Project fence line (Table 7 and Figure 6). One flock of 15 individuals was observed on April 2, 2012 and two small groups containing two individuals were observed on April 14, 2012 (Figure 6).

Golden Eagle (CDFG: FP, Watch List [WL]; USFWS: BCC)

One Golden Eagle observation occurred approximately 2,400 m north of raptor fixed-point 1R outside of the Project fence line on April 8, 2012 (Table 7, Figure 2 and Figure 6). The Golden Eagle was being attacked by a Red-tailed Hawk and a Cooper's Hawk and no signs of nesting or breeding were observed. The REAT-approved protocol surveys for nesting Golden Eagles on the project site and within a ten mile radius surrounding the Project conducted in accordance with REAT and other applicable protocols during March – May 2012 detected no active Golden Eagle nests within this area.

Peregrine Falcon (CDFG: FP; USFWS: BCC)

There were 9 Peregrine Falcon observations during the Spring 2012 surveys, most of which (7 observations) occurred outside of the Project fence line (Table 7 and Figure 6). Seven of the observations occurred during the non-raptor fixed-point observation counts, one occurred during the raptor fixed-point observation counts and one occurred during the transect point counts (Table 7). All observations were

single individuals in flight with the exception of two individuals observed flying together on April 5, 2012 (Figure 2 and Figure 6).

4.1.6 Waterbirds

A total of 1,435 waterbird observations (average of 19.4 observations per survey day) consisting of 14 species were made during fixed-point observation counts and transect point counts (Table 8). White-faced Ibis accounted for 81 percent of all observations (1,163 observations), and the Double-crested Cormorant accounted for 12.3 percent of all observations (176 observations) (Table 8). These two species accounted for 93.3 percent of all waterbird observations during the surveys. Waterbirds exhibited a strong association with the agricultural/riparian habitat east of the site. All but three waterbirds (99.8 percent of all observations) were observed outside the Project fence line (Figure 7).

4.2 SPRING 2012 RADAR MONITORING

The following is a summary of radar monitoring of nocturnal migration during spring 2012. For a complete description of the methodology and results of this study, see Appendix G.

The spring nocturnal radar study indicated that detected avian species tended to fly in a north-northwest direction at approximately 349.5 degrees. This result is consistent with the expected behavior of spring migrants flying north through a portion of the Pacific Flyway. The mean passage rates detected during the nocturnal radar survey were 330.68 targets per kilometer per hour (targets/km/hr) in horizontal mode and 207.83 targets/km/hr in vertical mode. The mean flight height was approximately 382.0 m above radar level (ARL). Approximately 34 percent of the of the nocturnal migrants flew at an altitude of less than or equal to approximately 229 m, the height of the two power towers within the Project, and 66 percent flew above approximately 229 m.

SECTION 5 SUMMARY

The purpose of this quarterly report is to present results from the spring 2012 bird surveys at the Rio Mesa SEGF. A full analysis and discussion of the data will occur after the fall 2012 bird surveys have been completed.

Per REAT request (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012) the Fall 2012 survey effort will consist of (1) weekly transect point counts from August 15, 2012 through November 1, 2012; (2) weekly non-raptor fixed-point observation counts from August 15, 2012 through November 1, 2012; (3) weekly raptor fixed-point observation counts from September 1, 2012 through November 30, 2012; and (4) radar monitoring of nocturnal migration from September 1, 2012 through October 31, 2012. All of these survey efforts will occur at the same locations using the same REAT approved methodology (Martinez 2011, Blair and White 2012, CEC 2012, Martinez 2012) as described in this report (Figures 2 and 3).

SECTION 6 REFERENCES

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Table 1 Spring 2012 Fixed-Point Observation Count Results for the Rio Mesa Solar Electric Generating Facility Project												
Common Name	**Scientific Name**	**Special Status**		**Resident Status***	**Non-raptor observation points**				**Raptor observation points**			**Total number of observations**
		Federal	**State**		**1B**	**2B**	**3B**	**4B**	**1R**	**2R**	**3R**	
Waterbirds (13 species, 1,374 observations, 6% of all observations)												
Waterfowl	**Order Anseriformes**											
Mallard	*Anas platyrhynchos*			W			2					2
Shorebirds & Relatives	**Order Charadriiformes**											
Black-Necked Stilt	*Himantopus mexicanus*			S			3					3
Greater Yellowlegs	*Tringa melanoleuca*			W							1	1
Killdeer	*Charadrius vociferus*			YR			18					18
Least Sandpiper	*Calidris minutilla*			W							1	1
Long-billed Curlew	*Numenius americanus*	BCC	WL	W							1	1
Ibises and Relatives	**Order Ciconiiformes**											
White-Faced Ibis	*Plegadis chihi*		WL	M			162				1,001	1,163
Cranes, Rails and Relatives	**Order Gruiformes**											
American Coot	*Fulica americana*			YR			3					3
Sandhill Crane	*Grus canadensis*		ST, FP	W	24		10					34
Totipalmates	**Order Pelecaniformes**											
American White Pelican	*Pelecanus erythrorhynchos*		SSC	W			1					1
Great Blue Heron	*Ardea herodias*			YR			3			2		5
Great Egret	*Ardea alba*			YR			26					26
Cormorants	**Order Suliformes**											
Double-Crested Cormorant	*Phalacrocorax auritus*		WL	YR			94			1	21	116
Raptors (14 species, 7,030 observations, 31% of all observations)												
Vultures & Hawks	**Order Accipitriformes**											
Cooper's Hawk	*Accipiter cooperii*		WL	W	2		5		5	1	12	25
Ferruginous Hawk	*Buteo regalis*	BCC	WL	W		1	1					2
Northern Harrier	*Circus cyaneus*		SSC	W	1		26	2	5	3	11	48
Osprey	*Pandion haliaetus*		WL	W			4	2	7	8	9	30
Red-Tailed Hawk	*Buteo jamaicensis*			YR	80	35	57	11	76	49	111	419
Sharp-Shinned Hawk	*Accipiter striatus*		WL	W			3		1		6	10
Swainson's Hawk	*Buteo swainsoni*	BCC	ST	M	2	2	11	3	17	3	26	64

Table 1 Spring 2012 Fixed-Point Observation Count Results for the Rio Mesa Solar Electric Generating Facility Project												
Common Name	**Scientific Name**	**Special Status**		**Resident Status***	**Non-raptor observation points**				**Raptor observation points**			**Total number of observations**
		Federal	**State**		**1B**	**2B**	**3B**	**4B**	**1R**	**2R**	**3R**	
Turkey Vulture	*Cathartes aura*			YR	816	1095	657	314	1,060	975	1,366	6,283
Falcons & Eagles	**Order Falconiformes**											
American Kestrel	*Falco sparverius*			YR	3	3	15	6	5	8	39	79
Golden Eagle	*Aquila chrysaetos*	BCC	FP, WL	YR					1			1
Merlin	*Falco columbarius*		WL	W	1					1		2
Peregrine Falcon	*Falco peregrinus*	BCC	FP	YR	3	1	2	1			1	8
Prairie Falcon	*Falco mexicanus*	BCC	WL	YR	6	5	8	9	7	4	7	46
Owls	**Order Strigiformes**											
Great Horned Owl	*Bubo virginianus*			YR		10			1		2	13
Other Non-Passerines (15 species, 1,787 observations, 8% of all observations)												
Game Birds	**Order Galliformes**											
Gambel's Quail	*Callipepla gambelii*			YR	92	8	52	3	2	2	25	184
Doves and Pigeons	**Order Columbiformes**											
Common Ground-Dove	*Columbina passerina*			YR					1			1
Eurasian Collared-Dove	*Streptopelia decaocto*			YR	14	3	6	3	1		15	42
Mourning Dove	*Zenaida macroura*			YR	185	221	135	93	113	83	163	993
Rock Pigeon	*Columba livia*			YR			15			5	3	23
White-Winged Dove	*Zenaida asiatica*			S	81	52	56	22	5	2	15	233
Cuckoos and Relatives	**Order Cuculiformes**											
Greater Roadrunner	*Geococcyx californianus*			YR	5	5	10	3	6	14	3	46
Nightjars and Relatives	**Order Caprimulgiformes**											
Common Poor-Will	*Phalaenoptilus nuttallii*			YR				1			1	2
Lesser Nighthawk	*Chordeiles acutipennis*			S	91	30	22	8	7	1	5	164
Swifts	**Order Apodiformes**											
Vaux's Swift	*Chaetura vauxi*		SSC	M	4		4	1				9
White-Throated Swift	*Aeronautes saxatalis*			YR					6	1	3	10
Hummingbirds	**Order Trochiliformes**											
Anna's Hummingbird	*Calypte anna*			YR	4	1	1	1	1			8
Black-Chinned Hummingbird	*Archilochus alexandri*			S	2	2	1			1	2	8

Table 1 Spring 2012 Fixed-Point Observation Count Results for the Rio Mesa Solar Electric Generating Facility Project												
Common Name	**Scientific Name**	**Special Status**		**Resident Status***	**Non-raptor observation points**				**Raptor observation points**			**Total number of observations**
		Federal	**State**		**1B**	**2B**	**3B**	**4B**	**1R**	**2R**	**3R**	
Costa's Hummingbird	*Calypte costae*			YR	3	2	2	1	2	1	2	13
Woodpeckers and Relatives	**Order Piciformes**											
Ladder-Backed Woodpecker	*Picoides scalaris*			YR	23	6	9	6	2	2	3	51
Passerines (72 species, 12,393 observations, 55% of all observations)												
Perchingbirds	**Order Passeriformes**											
Flycatchers												
Ash-Throated Flycatcher	*Myiarchus cinerascens*			YR	176	116	38	71	59	138	169	767
Black Phoebe	*Sayornis nigricans*			YR	1		7					8
Gray Flycatcher	*Empidonax wrightii*			M	4		1	1		4	1	11
Pacific Slope Flycatcher	*Empidonax difficilis*			M	8	1	2					11
Say's Phoebe	*Sayornis saya*			W	21	5	9	3	3	2	10	53
Western Kingbird	*Tyrannus verticalis*			S	57	11	28	6	22	18	27	169
Western Wood-Pewee	*Contopus sordidulus*			M	2		5					7
Willow Flycatcher	*Empidonax traillii*	BCC	SE	M	1		1					2
Verdins												
Verdin	*Auriparus flaviceps*			YR	214	47	51	28	22	11	116	489
Larks												
Horned Lark	*Eremophila alpestris*		WL	YR	43	103	99	51	36	47	38	417
Swallows												
Bank Swallow	*Riparia riparia*		ST	M						19		19
Barn Swallow	*Hirundo rustica*			M	48	33	55	25	47	31	64	303
Cliff Swallow	*Petrochelidon pyrrhonota*			M	93	20	226	60	135	90	305	929
Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*			YR	22	29	81	31	10	3	12	188
Purple Martin	*Progne subis*		SSC	IRR						1		1
Tree Swallow	*Tachycineta bicolor*			W	96	104	725	74	30	102	81	1,212
Violet-Green Swallow	*Tachycineta thalassina*			M	4	10	26	3	31	98	67	239
Jays and Crows												
American Crow	*Corvus brachyrhynchos*			W	1							1
Common Raven	*Corvus corax*			YR	20	9	18	4	5	6	26	88

Table 1 Spring 2012 Fixed-Point Observation Count Results for the Rio Mesa Solar Electric Generating Facility Project												
Common Name	**Scientific Name**	**Special Status**		**Resident Status***	**Non-raptor observation points**				**Raptor observation points**			**Total number of observations**
		Federal	**State**		**1B**	**2B**	**3B**	**4B**	**1R**	**2R**	**3R**	
Wrens												
Bewick's Wren	*Thryomanes bewickii*			W	6							6
Cactus Wren	*Campylorhynchus brunneicapillus*			YR	61	46	5	23	13	54	17	219
Canyon Wren	*Catherpes mexicanus*			YR	1							1
Marsh Wren	*Cistothorus palustris*			YR			3					3
Rock Wren	*Salpinctes obsoletus*			YR	8		3					11
Mockingbirds and Thrashers												
Crissal Thrasher	*Toxostoma crissale*		SSC	YR	3	1	13			1		18
Le Conte's Thrasher	*Toxostoma lecontei*	BCC	SSC	YR		5		2	3	2		12
Northern Mockingbird	*Mimus polyglottos*			YR	29	10	1	1	3	1	26	71
Sage Thrasher	*Oreoscoptes montanus*			W	8	10	1	18	5	2	20	64
Thrushes												
Mountain Bluebird	*Sialia currucoides*			W		16	22	13				51
Western Bluebird	*Sialia mexicana*			W			2					2
Gnatcatchers and Kinglets												
Black-Tailed Gnatcatcher	*Polioptila melanura*			YR	88	33	37	17	24	34	39	272
Blue-Gray Gnatcatcher	*Polioptila caerulea*			W			1		2		1	4
Ruby-Crowned Kinglet	*Regulus calendula*			W			1					1
Pipits												
American Pipit	*Anthus rubescens*			W		1			1			2
Phainopeplas												
Phainopepla	*Phainopepla nitens*			S	35	4	19		2	3	88	151
Shrikes												
Loggerhead Shrike	*Lanius ludovicianus*	BCC	SSC	YR	35	64	9	21	64	105	54	352
Starlings												
European Starling	*Sturnus vulgaris*			YR			105			2		107
Warblers												
Black-Throated Gray Warbler	*Setophaga nigrescens*			M	3							3

Table 1 Spring 2012 Fixed-Point Observation Count Results for the Rio Mesa Solar Electric Generating Facility Project												
Common Name	**Scientific Name**	**Special Status**		**Resident Status***	**Non-raptor observation points**				**Raptor observation points**			**Total number of observations**
		Federal	**State**		**1B**	**2B**	**3B**	**4B**	**1R**	**2R**	**3R**	
Common Yellowthroat	*Geothlypis trichas*			M			3					3
Lucy's Warbler	*Oreothlypis luciae*	BCC	SSC	S	6		1					7
MacGillivray's Warbler	*Geothlypis tolmiei*			M	2		1					3
Nashville Warbler	*Oreothlypis ruficapilla*			M	12		5					17
Orange-Crowned Warbler	*Oreothlypis celata*			M	25		4	1	5	2		37
Townsend's Warbler	*Setophaga townsendi*			M	7		2					9
Wilson's Warbler	*Cardellina pusilla*			M	12	2	22					36
Yellow Warbler	*Setophaga petechia*	BCC	SSC	M	4		2					6
Yellow-Rumped Warbler	*Setophaga coronata*			W	21		23	5	2	9	28	88
Vireos												
Warbling Vireo	*Vireo gilvus*			M	17		2					19
Old World Sparrows												
House Sparrow	*Passer domesticus*			YR			1	1				2
Blackbirds and Orioles												
Brewer's Blackbird	*Euphagus cyanocephalus*			W	19	13	298	5	1		43	379
Brown-Headed Cowbird	*Molothrus ater*			YR	64	36	58	32			6	196
Bullock's Oriole	*Icterus bullockii*			S	6				3	5		14
Great-Tailed Grackle	*Quiscalus mexicanus*			YR	1		24				30	55
Hooded Oriole	*Icterus cucullatus*			S	1	1						2
Red-Winged Blackbird	*Agelaius phoeniceus*			YR	140	283	1206	23	8	26	63	1,749
Scott's Oriole	*Icterus parisorum*			M					1			1
Western Meadowlark	*Sturnella neglecta*			YR			19	1				20
Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*		SSC	YR	2	53	2562	1			2	2,620
Tanagers												
Western Tanager	*Piranga ludoviciana*			M	6		4				2	12
Cardinals, Sparrows and Finches												
Black-Headed Grosbeak	*Pheucticus melanocephalus*			M	7	1						8
Black-Throated Sparrow	*Amphispiza bilineata*			YR	28	1	2	3	2	1	1	38
Blue Grosbeak	*Passerina caerulea*			S			1					1

Table 1 Spring 2012 Fixed-Point Observation Count Results for the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Special Status		Resident Status*	Non-raptor observation points				Raptor observation points			Total number of observations
		Federal	State		1B	2B	3B	4B	1R	2R	3R	
Brewer's Sparrow	*Spizella breweri*	BCC		W	101	17	13	6	88	7	11	243
Chipping Sparrow	*Spizella passerina*			W	15					1		16
Dark-Eyed Junco	*Junco hyemalis*			W	1							1
House Finch	*Haemorhous mexicanus*			YR	28	39	41	26	7	14	88	243
Lazuli Bunting	*Passerina amoena*			M	2		1				1	4
Lesser Goldfinch	*Spinus psaltria*			YR	3	2	7	3	1	2	2	20
Sage Sparrow	*Artemisiospiza belli*			W	5	5	17	12	25	41	53	158
Savannah Sparrow	*Passerculus sandwichensis*			W							1	1
Song Sparrow	*Melospiza melodia*			YR						4		4
White-Crowned Sparrow	*Zonotrichia leucophrys*			W	65	3	33	10	2		4	117
Totals Number Of Observations Per Point					***3130***	***2616***	***7370***	***1071***	***1993***	***2053***	***4351***	***22,584***
Percentage of Total Observations					***13.9***	***11.6***	***32.6***	***4.7***	***8.8***	***9.1***	***19.3***	***-***
Total Number of Species					***76***	***53***	***89***	***52***	***54***	***55***	***62***	***114***
Total number of Survey Days					***43***	***43***	***43***	***43***	***31***	***31***	***31***	***74***
Average Number of Observations Per Day					***72.8***	***60.8***	***171.4***	***24.9***	***64.3***	***66.2***	***140.4***	***305.2***
Total Number of Observations from Unknown Species					***1003***				***779***			***1782***

SE - State Endangered (California Endangered Species Act)
ST - State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (United States Fish and Wildlife Service)
FP - Fully Protected (California Department of Fish and Game)
SSC - Species of Special Concern (California Department of Fish and Game)
WL - Watch List (California Department of Fish and Game)
= Over 100 individuals observed

Resdient Status*
M-migrant
S- summer resident
W- winter resident
YR- year-round residnet
IRR- irregular/rare

Table 2 Spring 2012 Bird Transect Point Count Results for the Rio Mesa Solar Electric Generating Facility Project																				
Common Name	**Scientific Name**	**Resident Status***	**Special Status**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Total**
Waterbirds (2 species, 61 observations, 1% of all observations)																				
Totipalmates	**Order Pelicanformes**																			
Great Egret	*Ardea alba*	YR																1		1
Cormorants	**Order Suliformes**																			
Double-crested Cormorant	*Phalacrocorax auritus*	YR	WL															60		60
Raptors (7 species, 158 observations, 4% of all observations)																				
Vultures & Hawks	**Order Accipitriformes**																			
Cooper's Hawk	*Accipiter cooperii*	W	WL												1			1		2
Northern Harrier	*Circus cyaneus*	W	SSC															1		1
Red-tailed Hawk	*Buteo jamaicensis*	YR		1		7	2		1	4	4	1	1		31	23	3	1	9	88
Turkey Vulture	*Cathartes aura*	YR		2	2	1	3	1	2	2	2	1	5	2	5	19	3	10	1	61
Falcons	**Falconiformes**																			
Peregrine Falcon	*Falco peregrinus*	YR	BCC, FP											1						1
Prairie Falcon	*Falco mexicanus*	YR	BCC, WL			1			1											2
Owls	**Strigiformes**																			
Great Horned Owl	*Bubo virginianus*	YR									1		1					1		3
Other Non-Passerines (12 species, 1439 observations, 33% of all observations)																				
Game Birds	**Galliformes**																			
Gambel's Quail	*Callipepla gambelii*	YR			7	5		4	4	3	1	3	2		11	2	15	1	1	59
Doves and Pigeons	**Order Columbiformes**																			
Eurasian Collared-Dove	*Streptopelia decaocto*	YR				4				1	2		11		2		3	1		24
Mourning Dove	*Zenaida macroura*	YR		31	36	94	40	41	111	45	38	51	118	46	38	23	61	48	56	877
White-winged Dove	*Zenaida asiatica*	S		4	9	29	12	18	113	59	12	22	7	5	9	5	57	17	10	388
Cuckoos and Relatives	**Cuculiformes**																			
Greater Roadrunner	*Geococcyx californianus*	YR							1											1

Table 2 Spring 2012 Bird Transect Point Count Results for the Rio Mesa Solar Electric Generating Facility Project																				
Common Name	**Scientific Name**	**Resident Status***	**Special Status**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Total**
Nightjars and Relatives	**Caprimulgiformes**																			
Lesser Nighthawk	*Chordeiles acutipennis*	S		5	3	4		3	2		4	9	11	3	2			4		50
Swifts	**Apodiformes**																			
Vaux's Swift	*Chaetura vauxi*	M	SSC	3																3
White-throated Swift	*Aeronautes saxatalis*	YR								1										1
Hummingbirds	**Trochiliformes**																			
Anna's Hummingbird	*Calypte anna*	YR									1									1
Costa's Hummingbird	*Calypte costae*	YR								2					2					4
Woodpeckers and Relatives	**Piciformes**																			
Ladder-backed Woodpecker	*Picoides scalaris*	YR			3	9		1	1			4	8				2	2		30
Lewis's Woodpecker	*Melanerpes lewis*	W										1								1
Passerines (52 species, 2647 observations, 61% of all observations)																				
Perchingbirds	**Passeriformes**																			
Flycatchers																				
Ash-throated Flycatcher	*Myiarchus cinerascens*	YR		36	35	60	20	21	43	30	27	46	43	18	22	13	37	8	15	474
Black Phoebe	*Sayornis nigricans*	YR		1																1
Cassin's Kingbird	*Tyrannus vociferans*	IRR				14	2		1											17
Dusky Flycatcher	*Empidonax oberholseri*	M				1			1											2
Gray Flycatcher	*Empidonax wrightii*	M											1							1
Olive-sided Flycatcher	*Contopus cooperi*	M	SSC, BCC							1										1
Pacific Slope Flycatcher	*Empidonax difficilis*	M							2		2									4
Say's Phoebe	*Sayornis saya*	W											1		2	1				4
Western Kingbird	*Tyrannus verticalis*	S		2		10	1	3	4	6	1	3	1	4	11	1	3	2	2	54
Western Wood-Pewee	*Contopus sordidulus*	M										2							1	3
Willow Flycatcher	*Empidonax traillii*	M	SE, BCC						1									1		2

Table 2 Spring 2012 Bird Transect Point Count Results for the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
Verdins																				
Verdin	*Auriparus flaviceps*	YR		4	39	44	14	21	47	49	25	30	56	22	14		27	11	11	414
Larks																				
Horned Lark	*Eremophila alpestris*	YR	WL	18	8	5	8	8	3	3	2	11		8	8	6	13	4	14	119
Swallows																				
Barn Swallow	*Hirundo rustica*	M			2	2	4		2	2	9	1	5		5	6	15	3	12	68
Cliff Swallow	*Petrochelidon pyrrhonota*	M		2			1			1	1		1			3	9	4	10	32
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	YR		7					6	1		2		2		3		1		22
Tree Swallow	*Tachycineta bicolor*	W							3	3					1		5	7	1	20
Jays and Crows																				
Common Raven	*Corvus corax*	YR														1				1
Wrens																				
Bewick's Wren	*Thryomanes bewickii*	W							1			1								2
Cactus Wren	*Campylorhynchus brunneicapillus*	YR		6	4	9	10	7	4	1	12	1	24	12	7	29	2		3	131
Canyon Wren	*Catherpes mexicanus*	YR														1				1
Mockingbirds and Thrashers																				
Crissal Thrasher	*Toxostoma crissale*	YR	SSC														4			4
Le Conte's Thrasher	*Toxostoma lecontei*	YR	BCC, SCC			2			1	1					1			1		6
Northern Mockingbird	*Mimus polyglottos*	YR							1	2			1					1		5
Gnatcatchers and Kinglets																				
Black-tailed Gnatcatcher	*Polioptila melanura*	YR		9	23	23	2	4	23	4	5	9	15	8	3	2	7	4	3	144
Phainopeplas																				
Phainopepla	*Phainopepla nitens*	S				2		1		18			4			2	2	2		31

Table 2 Spring 2012 Bird Transect Point Count Results for the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
Shrikes																				
Loggerhead Shrike	*Lanius ludovicianus*	YR	BCC, SCC	2	9	9	9	2	7	4	10	9	16	8	2	5	6		5	103
Starlings																				
European Starling	*Sturnus vulgaris*	YR											2		2					4
Warblers																				
Lucy's Warbler	*Oreothlypis luciae*	S	BCC, SCC						7	4				1		1				13
MacGillivray's Warbler	*Geothlypis tolmiei*	M				2			3											5
Nashville Warbler	*Oreothlypis ruficapilla*	M								1	2				1					4
Orange-crowned Warbler	*Oreothlypis celata*	M				4		1	2	2	1	1			1		1			13
Townsend's Warbler	*Setophaga townsendi*	M			1					3	1	1	1					1		8
Wilson's Warbler	*Cardellina pusilla*	M				5		1	11	2		1	1		1	8			2	32
Yellow Warbler	*Setophaga petechia*	M	SSC, BCC		1				3	2		1					1			8
Yellow-rumped Warbler	*Setophaga coronata*	W		2								3	1							6
Vireos																				
Warbling Vireo	*Vireo gilvus*	M			2	1	1	3	4		1	2	1	1			1			17
Blackbirds and Orioles																				
Brown-headed Cowbird	*Molothrus ater*	YR		7	9	1		17	27	2	3	5	14	1	11		4	2	3	106
Brewer's Blackbird	*Euphagus cyanocephalus*	W		8						9			3	10	11					41
Bullock's Oriole	*Icterus bullockii*	S			1	3		2									1			7
Great-tailed Grackle	*Quiscalus mexicanus*	YR				1														1
Red-winged Blackbird	*Agelaius phoeniceus*	YR		27		7	35	42	2	21	1	8	64				132	36	15	390
Western Meadowlark	*Sturnella neglecta*	YR															1	6		7
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	YR	SSC										25		15		28	79	36	183
Tanagers																				
Western Tanager	*Piranga ludoviciana*	M		1	1		2		1	1	1	3	1		1			2		14

Table 2 Spring 2012 Bird Transect Point Count Results for the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
Cardinals, Sparrows and Finches																				
Black-headed Grosbeak	*Pheucticus melanocephalus*	M							4	1		3								8
Brewer's Sparrow	*Spizella breweri*	YR	BCC			2			2	2	1	3	1		7				1	19
Black-throated Sparrow	*Amphispiza bilineata*	W			4	2	2								1	3				12
House Finch	*Haemorhous mexicanus*	YR		1	1	11	3	1	17	11	4	1	4	5	1	2	10	3	1	76
Indigo Bunting	*Passerina cyanea*	M				1														1
Lesser Goldfinch	*Spinus psaltria*	YR							2	2				1						5
White-crowned Sparrow	*Zonotrichia leucophrys*	W		1																1
Total Number of Observations				180	200	375	171	202	471	306	174	239	450	158	229	159	453	326	212	4,305
Percentage of Total Observations				*4.2*	*4.6*	*8.7*	*4*	*4.7*	*11*	*7.1*	*4*	*5.6*	*10*	*3.7*	*5.3*	*3.7*	*11*	*7.6*	*4.9*	-
Total Number of Species				23	21	33	19	21	39	37	28	31	33	19	31	22	28	33	22	73
Total Number of Survey Days				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Average Number of Observations Per Day				30	33	63	29	34	79	51	29	40	75	26	38	27	76	54	35	718
Total Number of Observations from Unknown Species =125																				

SE - State Endangered (California Endangered Species Act)
ST - State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (United States Fish and Wildlife Service)
FP - Fully Protected (California Department of Fish and Game)
SSC - Species of Special Concern (California Department of Fish and Game)
WL - Watch List (California Department of Fish and Game)

Resdient Status*
M-migrant
S- summer resident
W- winter resident
YR- year-round residnet
IRR- irregular/rare

= Over 100 individuals observed

Table 3 Comparison of Habitat Use Between Project Site Habitat (Desert Mesa) and Agricultural/Riparian Habitat At Fixed-Point Observation Points (3B, 3R) and Transects (N, O) at Rio Mesa Solar Electric Generating Facility Project During Spring 2012

Common Name	Scientific Name	Resident Status*	Special Status		Agricultural/ Riparian (%)	Desert Mesa (%)	Chi-square value	p-value*	Total #	Habitat Association
			Federal	State						
Waterbirds										
Waterfowl	**Order Anseriformes**									
Mallard	*Anas platyrhynchos*	W			100	0	-	-	2	-
Shorebirds & Relatives	**Order Charadriiformes**									
Black-Necked Stilt	*Himantopus mexicanus*	S			100	0	-	-	3	-
Greater Yellowlegs	*Tringa melanoleuca*	W			100	0	-	-	1	-
Killdeer	*Charadrius vociferus*	YR			100	0	-	-	13	-
Least Sandpiper	*Calidris minutilla*	W			0	100	-	-	1	-
Long-billed Curlew	*Numenius americanus*	W	BCC	WL	100	0	-	-	1	-
Ibises and Relatives	**Order Ciconiiformes**									
White-Faced Ibis	*Plegadis chihi*	M		WL	87.1	12.9	640.39	0.00	1163	Agricultural/ Riparian
Cranes, Rails and Relatives	**Order Gruiformes**									
American Coot	*Fulica americana*	YR			100	0	-	-	2	-
Totipalmates	**Order Pelecaniformes**									
American White Pelican	*Pelecanus erythrorhynchos*	W		SSC	0	100	-	-	1	-
Great Blue Heron	*Ardea herodias*	YR			100	0	-	-	1	-
Great Egret	*Ardea alba*	YR			100	0	-	-	19	-
Cormorants	**Order Suliformes**									
Double-Crested Cormorant	*Phalacrocorax auritus*	YR		WL	98.7	1.3	151.10	0.00	159	Agricultural/ Riparian
Raptors										
Vultures & Hawks	**Order Accipitriformes**									
Cooper's Hawk	*Accipiter cooperii*	W		WL	55.6	44.4	-	-	18	-
Northern Harrier	*Circus cyaneus*	W		SSC	61.8	38.2	1.88	0.17	34	none
Osprey	*Pandion haliaetus*	W		WL	38.5	61.5	-	-	13	-
Red-Tailed Hawk	*Buteo jamaicensis*	YR			39.4	60.6	7.23	0.01	160	Desert Mesa
Sharp-Shinned Hawk	*Accipiter striatus*	W		WL	55.6	44.4	-	-	9	-

Table 3 Comparison of Habitat Use Between Project Site Habitat (Desert Mesa) and Agricultural/Riparian Habitat At Fixed-Point Observation Points (3B, 3R) and Transects (N, O) at Rio Mesa Solar Electric Generating Facility Project During Spring 2012

Common Name	Scientific Name	Resident Status*	Special Status		Agricultural/ Riparian (%)	Desert Mesa (%)	Chi-square value	p-value*	Total #	Habitat Association
			Federal	State						
Swainson's Hawk	*Buteo swainsoni*	M	BCC	ST	59.5	40.5	1.32	0.25	37	none
Turkey Vulture	*Cathartes aura*	YR			34.6	65.4	184.00	0.00	1937	Desert Mesa
Falcons & Eagles	**Order Falconiformes**									
American Kestrel	*Falco sparverius*	YR			44.2	55.8	0.69	0.41	52	none
Peregrine Falcon	*Falco peregrinus*	YR	BCC	FP	66.7	33.3	-	-	3	-
Prairie Falcon	*Falco mexicanus*	YR	BCC	WL	50	50	-	-	12	-
Owls	**Order Strigiformes**									
Great Horned Owl	*Bubo virginianus*	YR			33.3	66.7	-	-	3	-
Other Non-Passerines										
Game Birds	**Order Galliformes**									
Gambel's Quail	*Callipepla gambelii*	YR			76.5	23.5	23.82	0.00	85	Agricultural/ Riparian
Doves and Pigeons	**Order Columbiformes**									
Eurasian Collared-Dove	*Streptopelia decaocto*	YR			88	12	14.44	0.00	25	Agricultural/ Riparian
Mourning Dove	*Zenaida macroura*	YR			59.0	41.0	13.16	0.00	405	Agricultural/ Riparian
Rock Pigeon	*Columba livia*	YR			50	50	-	-	12	-
White-Winged Dove	*Zenaida asiatica*	S			72.5	27.5	27.86	0.00	138	Agricultural/ Riparian
Cuckoos and Relatives	**Order Cuculiformes**									
Greater Roadrunner	*Geococcyx californianus*	YR			76.9	23.1	-	-	13	-
Nightjars and Relatives	**Order Caprimulgiformes**									
Common Poor-Will	*Phalaenoptilus nuttallii*	YR			100	0	-	-	1	-
Lesser Nighthawk	*Chordeiles acutipennis*	S			25.8	74.2	7.26	0.01	31	Desert Mesa
Swifts	**Order Apodiformes**									
Vaux's Swift	*Chaetura vauxi*	M		SSC	50	50	-	-	4	-
White-Throated Swift	*Aeronautes saxatalis*	YR			66.7	33.3	-	-	3	-

Table 3 Comparison of Habitat Use Between Project Site Habitat (Desert Mesa) and Agricultural/Riparian Habitat At Fixed-Point Observation Points (3B, 3R) and Transects (N, O) at Rio Mesa Solar Electric Generating Facility Project During Spring 2012

Common Name	Scientific Name	Resident Status*	Special Status		Agricultural/ Riparian (%)	Desert Mesa (%)	Chi-square value	p-value*	Total #	Habitat Association
			Federal	State						
Hummingbirds	**Order Trochiliformes**									
Anna's Hummingbird	*Calypte anna*	YR			100	0	-	-	1	-
Black-Chinned Hummingbird	*Archilochus alexandri*	S			100	0	-	-	3	-
Costa's Hummingbird	*Calypte costae*	YR			25	75	-	-	4	-
Woodpeckers and Relatives	**Order Piciformes**									
Ladder-Backed Woodpecker	*Picoides scalaris*	YR			66.7	33.3	-	-	15	-
Passerines										
Perchingbirds	**Order Passeriformes**									
Flycatchers										
Ash-Throated Flycatcher	*Myiarchus cinerascens*	YR			46.7	53.3	1.04	0.31	246	none
Black Phoebe	*Sayornis nigricans*	YR			100	0	-	-	1	-
Gray Flycatcher	*Empidonax wrightii*	M			100	0	-	-	2	-
Pacific Slope Flycatcher	*Empidonax difficilis*	M			100	0	-	-	2	-
Say's Phoebe	*Sayornis saya*	W			56.3	43.8	-	-	16	-
Western Kingbird	*Tyrannus verticalis*	S			55.9	44.1	0.83	0.36	59	none
Western Wood-Pewee	*Contopus sordidulus*	M			100	0	-	-	5	-
Willow Flycatcher	*Empidonax traillii*	M	BCC	SE	50	50	-	-	2	-
Verdins										
Verdin	*Auriparus flaviceps*	YR			63	37	13.52	0.00	200	Agricultural/ Riparian
Larks										
Horned Lark	*Eremophila alpestris*	YR		WL	42.2	57.8	3.27	0.07	135	none
Swallows										
Barn Swallow	*Hirundo rustica*	M			55.5	44.5	1.64	0.20	137	none
Cliff Swallow	*Petrochelidon pyrrhonota*	M			65.5	34.5	51.41	0.00	536	Agricultural/ Riparian
Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*	YR			63.1	36.9	4.45	0.03	65	Agricultural/ Riparian

Table 3 Comparison of Habitat Use Between Project Site Habitat (Desert Mesa) and Agricultural/Riparian Habitat At Fixed-Point Observation Points (3B, 3R) and Transects (N, O) at Rio Mesa Solar Electric Generating Facility Project During Spring 2012

Common Name	Scientific Name	Resident Status*	Special Status		Agricultural/ Riparian (%)	Desert Mesa (%)	Chi-square value	p-value*	Total #	Habitat Association
			Federal	State						
Tree Swallow	*Tachycineta bicolor*	W			76.8	23.2	233.53	0.00	814	Agricultural/ Riparian
Violet-Green Swallow	*Tachycineta thalassina*	M			44.2	55.8	1.16	0.28	86	none
Jays and Crows										
Common Raven	*Corvus corax*	YR			36.4	63.6	3.27	0.07	44	none
Wrens										
Cactus Wren	*Campylorhynchus brunneicapillus*	YR			29.2	70.8	4.17	0.04	24	Project site
Marsh Wren	*Cistothorus palustris*	YR			100	0	-	-	2	-
Rock Wren	*Salpinctes obsoletus*	YR			33.3	66.7	-	-	3	-
Mockingbirds and Thrashers										
Crissal Thrasher	*Toxostoma crissale*	YR		SSC	100	0	-	-	16	-
Le Conte's Thrasher	*Toxostoma lecontei*	YR	BCC	SSC	0	100	-	-	1	-
Northern Mockingbird	*Mimus polyglottos*	YR			42.9	57.1	0.57	0.45	28	none
Sage Thrasher	*Oreoscoptes montanus*	W			40	60	0.80	0.37	20	none
Thrushes										
Mountain Bluebird	*Sialia currucoides*	W			100	0	-	-	1	-
Gnatcatchers and Kinglets										
Black-Tailed Gnatcatcher	*Polioptila melanura*	YR			52.9	47.1	0.29	0.59	85	none
Blue-Gray Gnatcatcher	*Polioptila caerulea*	W			0	100	-	-	2	-
Phainopeplas										
Phainopepla	*Phainopepla nitens*	S			64.5	35.5	8.98	0.00	107	Agricultural/ Riparian
Shrikes										
Loggerhead Shrike	*Lanius ludovicianus*	YR	BCC	SSC	46.3	53.7	0.37	0.54	67	none
Starlings										
European Starling	*Sturnus vulgaris*	YR			100	0	105.00	0.00	105	Agricultural/Riparian

Table 3 Comparison of Habitat Use Between Project Site Habitat (Desert Mesa) and Agricultural/Riparian Habitat At Fixed-Point Observation Points (3B, 3R) and Transects (N, O) at Rio Mesa Solar Electric Generating Facility Project During Spring 2012

Common Name	Scientific Name	Resident Status*	Special Status		Agricultural/ Riparian (%)	Desert Mesa (%)	Chi-square value	p-value*	Total #	Habitat Association
			Federal	State						
Warblers										
Common Yellowthroat	*Geothlypis trichas*	M			100	0	-	-	2	-
Lucy's Warbler	*Oreothlypis luciae*	S	BCC	SSC	100	0	-	-	1	-
MacGillivray's Warbler	*Geothlypis tolmiei*	M			100	0	-	-	1	-
Nashville Warbler	*Oreothlypis ruficapilla*	M			100	0	-	-	5	-
Orange-Crowned Warbler	*Oreothlypis celata*	M			100	0	-	-	5	-
Townsend's Warbler	*Setophaga townsendi*	M			66.7	33.3	-	-	3	-
Wilson's Warbler	*Cardellina pusilla*	M			90.9	9.1	14.73	0.00	22	Agricultural/ Riparian
Yellow Warbler	*Setophaga petechia*	M	BCC	SSC	66.7	33.3	-	-	3	-
Yellow-Rumped Warbler	*Setophaga coronata*	W			64.3	35.7	3.43	0.06	42	none
Vireos										
Warbling Vireo	*Vireo gilvus*	M			66.7	33.3	-	-	3	-
Old World Sparrows										
House Sparrow	*Passer domesticus*	YR			100	0	-	-	1	-
Blackbirds and Orioles										
Brewer's Blackbird	*Euphagus cyanocephalus*	W			86.5	13.5	75.24	0.00	141	Agricultural/ Riparian
Brown-Headed Cowbird	*Molothrus ater*	YR			84.3	15.7	32.91	0.00	70	Agricultural/ Riparian
Bullock's Oriole	*Icterus bullockii*	S			0	100	-	-	1	-
Great-Tailed Grackle	*Quiscalus mexicanus*	YR			44.4	55.6	0.67	0.41	54	none
Red-Winged Blackbird	*Agelaius phoeniceus*	YR			82.0	18.0	479.08	0.00	1171	Agricultural/ Riparian
Western Meadowlark	*Sturnella neglecta*	YR			88.5	11.5	15.38	0.00	26	Agricultural/ Riparian

Table 3 Comparison of Habitat Use Between Project Site Habitat (Desert Mesa) and Agricultural/Riparian Habitat At Fixed-Point Observation Points (3B, 3R) and Transects (N, O) at Rio Mesa Solar Electric Generating Facility Project During Spring 2012

Common Name	Scientific Name	Resident Status*	Special Status		Agricultural/ Riparian (%)	Desert Mesa (%)	Chi-square value	p-value*	Total #	Habitat Association
			Federal	State						
Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*	YR		SSC	98.6	1.4	2518.06	0.00	2664	Agricultural/ Riparian
Tanagers										
Western Tanager	*Piranga ludoviciana*	M			62.5	37.5	-	-	8	-
Cardinals, Sparrows and Finches										
Black-Throated Sparrow	*Amphispiza bilineata*	YR			0	100.0	-	-	3	-
Blue Grosbeak	*Passerina caerulea*	S			0.0	100.0	-	-	1	-
Brewer's Sparrow	*Spizella breweri*	W	BCC		66.7	33.3	2.67	0.10	24	none
House Finch	*Haemorhous mexicanus*	YR			66.9	33.1	14.56	0.00	127	Agricultural/ Riparian
Lazuli Bunting	*Passerina amoena*	M			50	50	-	-	2	-
Lesser Goldfinch	*Spinus psaltria*	YR			66.7	33.3	-	-	9	-
Sage Sparrow	*Artemisiospiza belli*	W			36.9	63.1	4.45	0.03	65	Desert Mesa
Savannah Sparrow	*Passerculus sandwichensis*	W			0	100	-	-	1	-
White-Crowned Sparrow	*Zonotrichia leucophrys*	W			75.8	24.2	8.76	0.00	33	Agricultural/ Riparian
Total					**71.5**	**28.5**	**2153.03**	**0.00**	**11683**	**Agricultural/ Riparian**

*p-values represent chi-square test of goodness-of-fit, significant results if p-values is less than 0.05

SE - State Endangered (California Endangered Species Act)
ST - State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (United States Fish and Wildlife Service)
FP - Fully Protected (California Department of Fish and Game)
SSC - Species of Special Concern (California Department of Fish and Game)
WL - Watch List (California Department of Fish and Game)
= Over 100 individuals observed

Resdient Status*
M-migrant
S- summer resident
W- winter resident
YR- year-round residnet
IRR- irregular/rare

Table 4 Comparison of Microphyll Woodland Use During Spring 2012 Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Number of Species						
Group	N	Median	Significance *	Mean	Std Dev	SEM
woodland	58	8	A	8.517	5.155	0.677
Adjacent	36	2	B	2.417	2.183	0.364
Desert Upland	34	1	C	0.882	1.066	0.183
Number of Observations						
Group	N	Median	Significance *	Mean	Std Dev	SEM
woodland	58	10.5	A	11.466	7.948	1.044
Adjacent	36	2	B	2.806	2.709	0.452
Desert Upland	34	1	B	1.206	1.629	0.279

*Kruskal-Wallis One Way Analysis of Variance on Ranks, Multiple Comparison Procedure (Dunn's Method).
P < 0.05 for groups with different letters

Table 5 Estimated Flight Heights Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Number of Observations with Flight Height Data	Average Flight Height (m)	Max Flight Height (m)	Min Flight Height (m)
			Federal	State				
Waterbirds (average flight height = 89.6 meters)								
Waterfowl	**Order Anseriformes**							
Mallard	*Anas platyrhynchos*	W			0	na	na	na
Shorebirds & Relatives	**Order Charadriiformes**							
Black-Necked Stilt	*Himantopus mexicanus*	S			0	na	na	na
Greater Yellowlegs	*Tringa melanoleuca*	W			1	30	30	30
Killdeer	*Charadrius vociferus*	YR			5	45.5	90	1
Least Sandpiper	*Calidris minutilla*	W			1	100	100	100
Long-billed Curlew	*Numenius americanus*	W	BCC	WL	1	10	10	10
Ibises and Relatives	**Order Ciconiiformes**							
White-Faced Ibis	*Plegadis chihi*	M		WL	1162	90	300	20
Cranes, Rails and Relatives	**Order Gruiformes**							
American Coot	*Fulica americana*	YR			3	50	70	30
Sandhill Crane	*Grus canadensis*	W		ST, FP	34	350	500	250
Totipalmates	**Order Pelecaniformes**							
American White Pelican	*Pelecanus erythrorhynchos*	W		SSC	1	60	60	60
Great Blue Heron	*Ardea herodias*	YR			5	113.8	250	5
Great Egret	*Ardea alba*	YR			23	50.2	300	3
Cormorants	**Order Suliformes**							
Double-Crested Cormorant	*Phalacrocorax auritus*	YR		WL	174	85.6	300	10

Table 5 Estimated Flight Heights Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Number of Observations with Flight Height Data	Average Flight Height (m)	Max Flight Height (m)	Min Flight Height (m)
			Federal	State				
Raptors (average flight height = 76.9 meters)								
Vultures & Hawks	**Order Accipitriformes**							
Cooper's Hawk	*Accipiter cooperii*	W		WL	25	71.9	400	1
Ferruginous Hawk	*Buteo regalis*	W	BCC	WL	2	85	120	50
Northern Harrier	*Circus cyaneus*	W		SSC	47	45.9	200	2
Osprey	*Pandion haliaetus*	W		WL	21	45.9	200	2
Red-Tailed Hawk	*Buteo jamaicensis*	YR			336	137.8	1000	2
Sharp-Shinned Hawk	*Accipiter striatus*	W		WL	10	48	250	5
Swainson's Hawk	*Buteo swainsoni*	M	BCC	ST	48	153.6	1000	20
Turkey Vulture	*Cathartes aura*	YR			6119	138.0	2000	1
Falcons & Eagles	**Order Falconiformes**							
American Kestrel	*Falco sparverius*	YR			71	69.3	600	2
Golden Eagle	*Aquila chrysaetos*	YR	BCC	FP, WL	1	100	100	100
Merlin	*Falco columbarius*	W		WL	2	16.5	30	3
Peregrine Falcon	*Falco peregrinus*	YR	BCC	FP	8	100	205	10
Prairie Falcon	*Falco mexicanus*	YR	BCC	WL	41	56.9	200	2
Owls	**Order Strigiformes**							
Great Horned Owl	*Bubo virginianus*	YR			9	8.2	15	2
Other Non-Passerines (average flight height = 16.9 meters)								
Game Birds	**Order Galliformes**							
Gambel's Quail	*Callipepla gambelii*	YR			63	3.2	10	0

Table 5 Estimated Flight Heights Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Number of Observations with Flight Height Data	Average Flight Height (m)	Max Flight Height (m)	Min Flight Height (m)
			Federal	State				
Doves and Pigeons	**Order Columbiformes**							
Common Ground-Dove	*Columbina passerina*	YR			1	2	2	2
Eurasian Collared-Dove	*Streptopelia decaocto*	YR			36	12.9	60	1.5
Mourning Dove	*Zenaida macroura*	YR			1213	13.2	300	0.5
Rock Pigeon	*Columba livia*	YR			23	62.6	100	15
White-Winged Dove	*Zenaida asiatica*	S			446	24.9	210	1
Cuckoos and Relatives	**Order Cuculiformes**							
Greater Roadrunner	*Geococcyx californianus*	YR			5	0.3	0.5	0
Nightjars and Relatives	**Order Caprimulgiformes**							
Common Poor-Will	*Phalaenoptilus nuttallii*	YR			0	na	na	na
Lesser Nighthawk	*Chordeiles acutipennis*	S			107	11.6	100	1
Swifts	**Order Apodiformes**							
Vaux's Swift	*Chaetura vauxi*	M		SSC	12	27.4	79	5
White-Throated Swift	*Aeronautes saxatalis*	YR			11	62	100	10
Hummingbirds	**Order Trochiliformes**							
Anna's Hummingbird	*Calypte anna*	YR			8	9.5	20	2
Black-Chinned Hummingbird	*Archilochus alexandri*	S			7	4	10	1
Costa's Hummingbird	*Calypte costae*	YR			12	6.6	50	1.5
Woodpeckers and Relatives	**Order Piciformes**							
Ladder-Backed Woodpecker	*Picoides scalaris*	YR			23	10.4	30	2
Lewis's Woodpecker	*Malanerpes lewis*	W			1	3	3	3

Table 5 Estimated Flight Heights Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Number of Observations with Flight Height Data	Average Flight Height (m)	Max Flight Height (m)	Min Flight Height (m)
			Federal	State				
Passerines (average flight height = 15.2 meters)								
Perchingbirds	**Order Passeriformes**							
Flycatchers								
Ash-Throated Flycatcher	*Myiarchus cinerascens*	YR			338	9.0	150	0.5
Black Phoebe	*Sayornis nigricans*	YR			9	2.6	5	1.5
Cassin's Kingbird	*Tyrannus vociferans*	IRR			17	10.6	20	5
Dusky Flycatcher	*Empidonax oberholseri*	M			0	na	na	na
Gray Flycatcher	*Empidonax wrightii*	M			7	11.4	25	5
Olive-sided flycatcher	*Contopus cooperi*	M		SSC	0	na	na	na
Pacific-slope Flycatcher	*Empidonax difficilis*	M			8	11.2	15	2
Say's Phoebe	*Sayornis saya*	YR			31	11.1	70	1
Western Kingbird	*Tyrannus verticalis*	S			150	12.4	100	1
Western Wood-Pewee	*Contopus sordidulus*	M			3	11.3	20	4
Willow Flycatcher	*Empidonax traillii*	M	BCC	SE	1	3	3	3
Verdins								
Verdin	*Auriparus flaviceps*	YR			0	na	na	na
Larks								
Horned Lark	*Eremophila alpestris*	YR		WL	325	36.5	115	0
Swallows								
Bank Swallow	*Riparia riparia*	M		ST	19	11	15	3
Barn Swallow	*Hirundo rustica*	M			353	27.9	200	1
Cliff Swallow	*Petrochelidon pyrrhonota*	M			874	37.3	266	1

Table 5 Estimated Flight Heights Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Number of Observations with Flight Height Data	Average Flight Height (m)	Max Flight Height (m)	Min Flight Height (m)
			Federal	State				
Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*	YR			206	21.6	120	1
Purple Martin	*Progne subis*	IRR		SSC	1	2	2	2
Tree Swallow	*Tachycineta bicolor*	W			1222	32.2	244	2
Violet-Green Swallow	*Tachycineta thalassina*	M			239	19.2	100	2
Jays and Crows								
American Crow	*Corvus brachyrhynchos*	IRR			1	50	70	30
Common Raven	*Corvus corax*	YR			72	89.1	415	2
Wrens								
Bewick's Wren	*Thryomanes bewickii*	W			2	5	5	5
Cactus Wren	*Campylorhynchus brunneicapillus*	YR			27	4.4	20	1
Canyon Wren	*Catherpes mexicanus*	YR			0	na	na	na
Marsh Wren	*Cistothorus palustris*	YR			2	0.75	1	0.5
Rock Wren	*Salpinctes obsoletus*	YR			4	2.75	5	0
Mockingbirds and Thrashers								
Crissal Thrasher	*Toxostoma crissale*	YR		SSC	4	2.7	3	2
Le Conte's Thrasher	*Toxostoma lecontei*	YR	BCC	SSC	1	3	3	3
Northern Mockingbird	*Mimus polyglottos*	YR			27	9.0	24	1
Sage Thrasher	*Oreoscoptes montanus*	W			24	3.9	30	0
Thrushes								
Mountain Bluebird	*Sialia currucoides*	W			45	6.1	22	1
Western Bluebird	*Sialia mexicana*	W			2	40	40	40

Table 5 Estimated Flight Heights Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Number of Observations with Flight Height Data	Average Flight Height (m)	Max Flight Height (m)	Min Flight Height (m)
			Federal	State				
Gnatcatchers and Kinglets								
Black-Tailed Gnatcatcher	*Polioptila melanura*	YR			130	5.5	50	0.5
Blue-Gray Gnatcatcher	*Polioptila caerulea*	W			2	1.5	2	1
Ruby-Crowned Kinglet	*Regulus calendula*	W			0	na	na	na
Pipits								
American Pipit	*Anthus rubescens*	W			2	40	50	30
Phainopeplas								
Phainopepla	*Phainopepla nitens*	S			92	19.2	100	1
Shrikes								
Loggerhead Shrike	*Lanius ludovicianus*	YR	BCC	SSC	156	8.6	100	0
Starlings								
European Starling	*Sturnus vulgaris*	YR			106	22.3	35	4
Warblers								
Black-Throated Gray Warbler	*Setophaga nigrescens*	M			1	15	15	15
Common Yellowthroat	*Geothlypis trichas*	M			2	0.8	1	0.5
Lucy's Warbler	*Oreothlypis luciae*	S	BCC	SSC	2	5.8	10	1.5
MacGillivray's Warbler	*Geothlypis tolmiei*	M			3	7.3	20	1
Nashville Warbler	*Oreothlypis ruficapilla*	M			10	6.7	15	3
Orange-Crowned Warbler	*Oreothlypis celata*	M			25	7.8	20	1
Townsend's Warbler	*Setophaga townsendi*	M			9	12.8	20	2
Wilson's Warbler	*Cardellina pusilla*	M			34	6.4	20	0.3
Yellow Warbler	*Setophaga petechia*	M	BCC	SSC	1	1.2	1.2	1.2

Table 5 Estimated Flight Heights Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Number of Observations with Flight Height Data	Average Flight Height (m)	Max Flight Height (m)	Min Flight Height (m)
			Federal	State				
Yellow-Rumped Warbler	*Setophaga coronata*	W			50	14.0	50	2
Vireos								
Warbling Vireo	*Vireo gilvus*	M			16	9.2	20	2
Old World Sparrows								
House Sparrow	*Passer domesticus*	YR			1	16	16	16
Blackbirds and Orioles								
Brewer's Blackbird	*Euphagus cyanocephalus*	W			195	23.3	100	2
Brown-Headed Cowbird	*Molothrus ater*	YR			252	18.6	70	2
Bullock's Oriole	*Icterus bullockii*	S			19	10.6	30	2
Great-Tailed Grackle	*Quiscalus mexicanus*	YR			48	33	70	10
Hooded Oriole	*Icterus cucullatus*	S			1	4	4	4
Red-Winged Blackbird	*Agelaius phoeniceus*	YR			2024	29.6	200	1
Scott's Oriole	*Icterus parisorum*	M			0	na	na	na
Western Meadowlark	*Sturnella neglecta*	YR			3	12.5	15	10
Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*	YR		SSC	2062	29.0	200	0.5
Tanagers								
Western Tanager	*Piranga ludoviciana*	M			17	8.7	30	0.5
Cardinals, Sparrows and Finches								
Black-Headed Grosbeak	*Pheucticus melanocephalus*	M			0	na	na	na
Black-Throated Sparrow	*Amphispiza bilineata*	YR			25	3.8	10	0
Blue Grosbeak	*Passerina caerulea*	S			0	na	na	na
Brewer's Sparrow	*Spizella breweri*	W	BCC		187	4.6	25	0.5

Table 5 Estimated Flight Heights Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Number of Observations with Flight Height Data	Average Flight Height (m)	Max Flight Height (m)	Min Flight Height (m)
			Federal	State				
Chipping Sparrow	*Spizella passerina*	W			2	5.5	6	5
Dark-Eyed Junco	*Junco hyemalis*	W			0	na	na	na
House Finch	*Haemorhous mexicanus*	YR			162	36.5	150	2
Indigo bunting	*Passerina cyanea*	S			0	na	na	na
Lazuli Bunting	*Passerina amoena*	M			2	16.5	30	3
Lesser Goldfinch	*Spinus psaltria*	YR			11	48.1	200	1
Sage Sparrow	*Artemisiospiza belli*	W			46	19.7	200	1
Savannah Sparrow	*Passerculus sandwichensis*	W			1	2	2	2
Song Sparrow	*Melospiza melodia*	YR			4	5.5	10	1
White-Crowned Sparrow	*Zonotrichia leucophrys*	W			62	7.4	40	0.5
Total						Average= 31.33	Max= 2000	Min= 0.5

na= species not observed in flight or no data collected
SE - State Endangered (California Endangered Species Act)
ST - State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (United States Fish and Wildlife Service)
FP - Fully Protected (California Department of Fish and Game)
SSC - Species of Special Concern (California Department of Fish and Game)
WL - Watch List (California Department of Fish and Game)

Resdient Status*
M-migrant
S- summer resident
W- winter resident
YR- year-round residnet
IRR- irregular/rare

Table 6 Observed Flight Directions During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		insufficient data	E	N	NE	NW	S	SE	SW	W
			Federal	State									
Waterbirds (most common flight directions: N and E)													
Waterfowl	**Order Anseriformes**												
Mallard	*Anas platyrhynchos*	W			2								
Shorebirds & Relatives	**Order Charadriiformes**												
Black-Necked Stilt	*Himantopus mexicanus*	S			3								
Greater Yellowlegs	*Tringa melanoleuca*	W							1				
Killdeer	*Charadrius vociferus*	YR			11	2	5						
Least Sandpiper	*Calidris minutilla*	W											1
Long-billed Curlew	*Numenius americanus*	W	BCC	WL						1			
Ibises and Relatives	**Order Ciconiiformes**												
White-Faced Ibis	*Plegadis chihi*	M		WL	291	350	366		80		40		36
Cranes, Rails and Relatives	**Order Gruiformes**												
American Coot	*Fulica americana*	YR					3						
Sandhill Crane	*Grus canadensis*	W		ST, FP			27			7			
Totipalmates	**Order Pelecaniformes**												
American White Pelican	*Pelecanus erythrorhynchos*	W		SSC						1			
Great Blue Heron	*Ardea herodias*	YR					1	1		1		2	
Great Egret	*Ardea alba*	YR			5	1	16		1	4			
Cormorants	**Order Suliformes**												
Double-Crested Cormorant	*Phalacrocorax auritus*	YR		WL	3		115		7	43	3	3	2
Raptors (most common flight directions: NW and W)													
Vultures & Hawks	**Order Accipitriformes**												
Cooper's Hawk	*Accipiter cooperii*	W		WL	5	1	10	2	6				3
Ferruginous Hawk	*Buteo regalis*	W	BCC	WL			1		1				
Northern Harrier	*Circus cyaneus*	W		SSC	3	6	10	2	5	12	3	1	7
Osprey	*Pandion haliaetus*	W		WL	11	1	3		10				5
Red-Tailed Hawk	*Buteo jamaicensis*	YR			289	35	56	12	17	43	13	8	37

Table 6 Observed Flight Directions During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		insufficient data	E	N	NE	NW	S	SE	SW	W
			Federal	State									
Sharp-Shinned Hawk	*Accipiter striatus*	W		WL			2		2	3		1	2
Swainson's Hawk	*Buteo swainsoni*	M	BCC	ST	19	7	12	2	6	3	1	10	4
Turkey Vulture	*Cathartes aura*	YR			868	320	719	60	1830	561	42	452	1492
Falcons & Eagles	**Order Falconiformes**												
American Kestrel	*Falco sparverius*	YR			21	10	9	5	6	10		4	14
Golden Eagle	*Aquila chrysaetos*	YR	BCC	FP, WL	1								
Merlin	*Falco columbarius*	W		WL		1							1
Peregrine Falcon	*Falco peregrinus*	YR	BCC	FP	1	1	5			1			1
Prairie Falcon	*Falco mexicanus*	YR	BCC	WL	7	8	9	4	6	2	1	3	8
Owls	**Order Strigiformes**												
Great Horned Owl	*Bubo virginianus*	YR			10	1		1		1			3
Other Non-Passerines (most common flight directions: E and W)													
Game Birds	**Order Galliformes**												
Gambel's Quail	*Callipepla gambelii*	YR			185	38	9			7			4
Doves and Pigeons	**Order Columbiformes**												
Common Ground-Dove	*Columbina passerina*	YR				1							
Eurasian Collared-Dove	*Streptopelia decaocto*	YR			30	3	5	2	10	7	1	1	7
Mourning Dove	*Zenaida macroura*	YR			660	416	117	61	51	143	40	56	326
Rock Pigeon	*Columba livia*	YR			1		15			5		2	
White-Winged Dove	*Zenaida asiatica*	S			178	132	30	18	8	87	9	24	135
Cuckoos and Relatives	**Order Cuculiformes**												
Greater Roadrunner	*Geococcyx californianus*	YR			46			1					
Nightjars and Relatives	**Order Caprimulgiformes**												
Common Poor-Will	*Phalaenoptilus nuttallii*	YR			2								
Lesser Nighthawk	*Chordeiles acutipennis*	S			109	65	7		3	6		1	23
Swifts	**Order Apodiformes**												
Vaux's Swift	*Chaetura vauxi*	M		SSC		2	1		1	4			4

Table 6 Observed Flight Directions During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		insufficient data	E	N	NE	NW	S	SE	SW	W
			Federal	State									
White-Throated Swift	*Aeronautes saxatalis*	YR			6		1	2	2				
Hummingbirds	**Order Trochiliformes**												
Anna's Hummingbird	*Calypte anna*	YR			2	2	3			1			1
Black-Chinned Hummingbird	*Archilochus alexandri*	S				3	1		1	1			2
Costa's Hummingbird	*Calypte costae*	YR			6	5					1		5
Woodpeckers and Relatives	**Order Piciformes**												
Ladder-Backed Woodpecker	*Picoides scalaris*	YR			61	9	1		1	1			8
Lewis's Woodpecker	*Melanerpes lewis*	W					1						
Passerines (most common flight directions: S, W, N, E)													
Perchingbirds	**Order Passeriformes**												
Flycatchers													
Ash-Throated Flycatcher	*Myiarchus cinerascens*	YR			942	72	61	7	12	55	13	8	71
Black Phoebe	*Sayornis nigricans*	YR			8	1							
Cassin's Kingbird	*Tyrannus vociferans*	IRR				2						5	10
Dusky Flycatcher	*Empidonax oberholseri*	M			2								
Gray Flycatcher	*Empidonax wrightii*	M			4	2	2			2			2
Olive-sided Flycatcher	*Contopus cooperi*	M		SSC	1								
Pacific Slope Flycatcher	*Empidonax difficilis*	M			10	1	1			1			2
Say's Phoebe	*Sayornis saya*	W			33	5	9			3	4		3
Western Kingbird	*Tyrannus verticalis*	S			73	44	20	2	12	24	7	6	35
Western Wood-Pewee	*Contopus sordidulus*	M			7		1			2			
Willow Flycatcher	*Empidonax traillii*	M	BCC	SE	4								
Verdins													
Verdin	*Auriparus flaviceps*	YR			726	53	32	4	6	33	1	1	47
Larks													
Horned Lark	*Eremophila alpestris*	YR		WL	199	59	52	15	20	43	27	38	83

Table 6 Observed Flight Directions During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		insufficient data	E	N	NE	NW	S	SE	SW	W
			Federal	State									
Swallows													
Bank Swallow	*Riparia riparia*	M		ST					4				15
Barn Swallow	*Hirundo rustica*	M			16	54	131	5	50	11	8	33	63
Cliff Swallow	*Petrochelidon pyrrhonota*	M			220	114	176	31	129	37	33	34	187
Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*	YR			14	32	30	3	35	47	5	11	33
Purple Martin	*Progne subis*	IRR		SSC								1	
Tree Swallow	*Tachycineta bicolor*	W			24	242	396	21	107	143	68	56	175
Violet-Green Swallow	*Tachycineta thalassina*	M			10	63	14	2	9	39	7	22	73
Jays and Crows													
American Crow	*Corvus brachyrhynchos*	W					1						
Common Raven	*Corvus corax*	YR			17	14	6	4	4	13	3	9	19
Wrens													
Bewick's Wren	*Thryomanes bewickii*	W			6		1						1
Cactus Wren	*Campylorhynchus brunneicapillus*	YR			330	11	1		1	1	1	2	3
Canyon Wren	*Catherpes mexicanus*	YR			2								
Marsh Wren	*Cistothorus palustris*	YR			3								
Rock Wren	*Salpinctes obsoletus*	YR			7	1	1			1			1
Mockingbirds and Thrashers													
Crissal Thrasher	*Toxostoma crissale*	YR		SSC	18	1	1		2				
Le Conte's Thrasher	*Toxostoma lecontei*	YR	BCC	SSC	17						1		
Northern Mockingbird	*Mimus polyglottos*	YR			56	5	4	1	1	3	2		4
Sage Thrasher	*Oreoscoptes montanus*	W			37	1	6	10		2		2	6
Thrushes													
Mountain Bluebird	*Sialia currucoides*	W			6	30		4	4	5			2
Western Bluebird	*Sialia mexicana*	W			0								2

Table 6 Observed Flight Directions During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		insufficient data	E	N	NE	NW	S	SE	SW	W
			Federal	State									
Gnatcatchers and Kinglets													
Black-Tailed Gnatcatcher	*Polioptila melanura*	YR			302	35	20	3	4	15	5		32
Blue-Gray Gnatcatcher	*Polioptila caerulea*	W			2					1		1	
Ruby-Crowned Kinglet	*Regulus calendula*	W			1								
Pipits													
American Pipit	*Anthus rubescens*	W					2						
Phainopeplas													
Phainopepla	*Phainopepla nitens*	S			96	26	7		11	3	8	3	28
Shrikes													
Loggerhead Shrike	*Lanius ludovicianus*	YR	BCC	SSC	313	46	12	1	7	18	9	7	42
Starlings													
European Starling	*Sturnus vulgaris*	YR			5	2	2			100		2	
Warblers													
Black-Throated Gray Warbler	*Setophaga nigrescens*	M			2	1							
Common Yellowthroat	*Geothlypis trichas*	M			3								
Lucy's Warbler	*Oreothlypis luciae*	S	BCC	SSC	18								2
MacGillivray's Warbler	*Geothlypis tolmiei*	M			5		2						1
Nashville Warbler	*Oreothlypis ruficapilla*	M			11	1	6						3
Orange-Crowned Warbler	*Oreothlypis celata*	M			27	8	5			2			8
Townsend's Warbler	*Setophaga townsendi*	M			8		3			1			5
Wilson's Warbler	*Cardellina pusilla*	M			37	3	3	5	2	2	1		15
Yellow Warbler	*Setophaga petechia*	M	BCC	SSC	13		1						
Yellow-Rumped Warbler	*Setophaga coronata*	W			47	15	6	1	5	7	3	1	9
Vireos													
Warbling Vireo	*Vireo gilvus*	M			20	8		2		1			5
Old World Sparrows													
House Sparrow	*Passer domesticus*	YR					1						1

Table 6 Observed Flight Directions During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		insufficient data	E	N	NE	NW	S	SE	SW	W
			Federal	State									
Blackbirds and Orioles													
Brewer's Blackbird	*Euphagus cyanocephalus*	W			265	7	17	8	27	38	28	7	23
Brown-Headed Cowbird	*Molothrus ater*	YR			48	39	29		4	60	1	43	78
Bullock's Oriole	*Icterus bullockii*	S			2	11	1		3			3	1
Great-Tailed Grackle	*Quiscalus mexicanus*	YR			8	26			1	7	9		5
Hooded Oriole	*Icterus cucullatus*	S			1	1							
Red-Winged Blackbird	*Agelaius phoeniceus*	YR			154	299	288	55	45	679	92	143	384
Scott's Oriole	*Icterus parisorum*	M			1								
Western Meadowlark	*Sturnella neglecta*	YR			24		1						2
Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*	YR		SSC	1342	32	126	2	6	1060	29	25	181
Tanagers													
Western Tanager	*Piranga ludoviciana*	M			9	1	3	2	2	2			7
Cardinals, Sparrows and Finches													
Black-Headed Grosbeak	*Pheucticus melanocephalus*	M			8	4	1						3
Black-Throated Sparrow	*Amphispiza bilineata*	YR			31	4	4	2		2			7
Blue Grosbeak	*Passerina caerulea*	S			1								
Brewer's Sparrow	*Spizella breweri*	W	BCC		85	69	14		3	28	10	3	50
Chipping Sparrow	*Spizella passerina*	W			14						1		1
Dark-Eyed Junco	*Junco hyemalis*	W			1								
House Finch	*Haemorhous mexicanus*	YR			145	57	37	8	12	14	7	12	27
Indigo Bunting	*Passerina cyanea*	M			1								
Lazuli Bunting	*Passerina amoena*	S			2		1		1				
Lesser Goldfinch	*Spinus psaltria*	YR			12	4	1	2	1		3	1	1
Sage Sparrow	*Artemisiospiza belli*	W			106	2	19	3	1	5	6	3	13

Table 6 Observed Flight Directions During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		insufficient data	E	N	NE	NW	S	SE	SW	W
			Federal	State									
Savannah Sparrow	*Passerculus sandwichensis*	W								1			
Song Sparrow	*Melospiza melodia*	YR								3			1
White-Crowned Sparrow	*Zonotrichia leucophrys*	W			66	10	9	1	1	15			16
Totals Number Of Observations Per Direction					***8864***	***2938***	***3127***	***377***	***2587***	***3484***	***546***	***1050***	***3919***
Percentage of Total					***-***	***16.3***	***17.3***	***2.09***	***14.3***	***19.3***	***3.03***	***5.82***	***21.7***
Total Number of Species					***97***	***71***	***79***	***41***	***55***	***67***	***40***	***42***	***76***

SE - State Endangered (California Endangered Species Act)
ST - State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (United States Fish and Wildlife Service)
FP - Fully Protected (California Department of Fish and Game)
SSC - Species of Special Concern (California Department of Fish and Game)
WL - Watch List (California Department of Fish and Game)

Resident Status*
M-migrant
S- summer resident
W- winter resident
YR- year-round residnet
IRR- irregular/rare

Table 7 Flock Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-flock (1-5 Individuals)	Small Flock (6-50 Individuals)	Large Flock (>50 Individuals)	Total number of Flocks	Insufficient Data	Maximum Flock Size	Average Number of Individuals per Observation
			Federal	State							
Waterbirds											
Waterfowl	**Order Anseriformes**										
Mallard	*Anas platyrhynchos*	W			1					2	2
Shorebirds & Relatives	**Order Charadriiformes**										
Black-Necked Stilt	*Himantopus mexicanus*	S			1					3	3
Greater Yellowlegs	*Tringa melanoleuca*	W			1					1	1
Killdeer	*Charadrius vociferus*	YR			4	1		1		10	4
Least Sandpiper	*Calidris minutilla*	W			1					1	1
Long-billed Curlew	*Numenius americanus*	W	BCC	WL	1					1	1
Ibises and Relatives	**Order Ciconiiformes**										
White-Faced Ibis	*Plegadis chihi*	M		WL	1	6	7	13		350	83
Cranes, Rails and Relatives	**Order Gruiformes**										
American Coot	*Fulica americana*	YR			2					2	2
Sandhill Crane	*Grus canadensis*	W		ST, FP	1	2		2		24	11
Totipalmates	**Order Pelecaniformes**										
American White Pelican	*Pelecanus erythrorhynchos*	W		SSC	1					1	1
Great Blue Heron	*Ardea herodias*	YR			4					2	1
Great Egret	*Ardea alba*	YR			9	2		2		8	2
Cormorants	**Order Suliformes**										
Double-Crested Cormorant	*Phalacrocorax auritus*	YR		WL	78		1	1		60	2

Table 7 Flock Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-flock (1-5 Individuals)	Small Flock (6-50 Individuals)	Large Flock (>50 Individuals)	Total number of Flocks	Insufficient Data	Maximum Flock Size	Average Number of Individuals per Observation
			Federal	State							
Raptors											
Vultures & Hawks	**Order Accipitriformes**										
Cooper's Hawk	*Accipiter cooperii*	W		WL	27					1	1
Ferruginous Hawk	*Buteo regalis*	W	BCC	WL	2					1	1
Northern Harrier	*Circus cyaneus*	W		SSC	46					2	1
Osprey	*Pandion haliaetus*	W		WL	29					2	1
Red-Tailed Hawk	*Buteo jamaicensis*	YR			432				1	4	1
Sharp-Shinned Hawk	*Accipiter striatus*	W		WL	10					1	1
Swainson's Hawk	*Buteo swainsoni*	M	BCC	ST	43	1		1		14	1
Turkey Vulture	*Cathartes aura*	YR			1128	165	17	182		310	5
Falcons & Eagles	**Order Falconiformes**										
American Kestrel	*Falco sparverius*	YR			76					2	1
Golden Eagle	*Aquila chrysaetos*	YR	BCC	FP, WL	1					1	1
Merlin	*Falco columbarius*	W		WL	2					1	1
Peregrine Falcon	*Falco peregrinus*	YR	BCC	FP	8					2	1
Prairie Falcon	*Falco mexicanus*	YR	BCC	WL	46					2	1
Owls	**Order Strigiformes**										
Great Horned Owl	*Bubo virginianus*	YR			16					1	1
Other Non-Passerines											
Game Birds	**Order Galliformes**										
Gambel's Quail	*Callipepla gambelii*	YR			138	5		5	5	20	2
Doves and Pigeons	**Order Columbiformes**										
Common Ground-Dove	*Columbina passerina*	YR			1					1	1
Eurasian Collared-Dove	*Streptopelia decaocto*	YR			45	1		1		9	1

Table 7 Flock Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-flock (1-5 Individuals)	Small Flock (6-50 Individuals)	Large Flock (>50 Individuals)	Total number of Flocks	Insufficient Data	Maximum Flock Size	Average Number of Individuals per Observation
			Federal	State							
Mourning Dove	*Zenaida macroura*	YR			1195	16		16	6	12	2
Rock Pigeon	*Columba livia*	YR			7					5	3
White-Winged Dove	*Zenaida asiatica*	S			359	12		12		25	2
Cuckoos and Relatives	**Order Cuculiformes**										
Greater Roadrunner	*Geococcyx californianus*	YR			47					1	1
Nightjars and Relatives	**Order Caprimulgiformes**										
Common Poor-Will	*Phalaenoptilus nuttallii*	YR			2					1	1
Lesser Nighthawk	*Chordeiles acutipennis*	S			156	4		4		8	1
Swifts	**Order Apodiformes**										
Vaux's Swift	*Chaetura vauxi*	M		SSC	10					2	1
White-Throated Swift	*Aeronautes saxatalis*	YR			4	1		1		6	2
Hummingbirds	**Order Trochiliformes**										
Anna's Hummingbird	*Calypte anna*	YR			9					1	1
Black-Chinned Hummingbird	*Archilochus alexandri*	S			8					1	1
Costa's Hummingbird	*Calypte costae*	YR			17					1	1
Woodpeckers and Relatives	**Order Piciformes**										
Lewis's Woodpecker	*Melanerpes lewis*	YR			1					1	1
Ladder-Backed Woodpecker	*Picoides scalaris*	W			76					4	1

Table 7 Flock Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-flock (1-5 Individuals)	Small Flock (6-50 Individuals)	Large Flock (>50 Individuals)	Total number of Flocks	Insufficient Data	Maximum Flock Size	Average Number of Individuals per Observation
			Federal	State							
Passerines											
Perchingbirds	**Order Passeriformes**										
Flycatchers											
Ash-Throated Flycatcher	*Myiarchus cinerascens*	YR			1057				2	4	1
Black Phoebe	*Sayornis nigricans*	YR			3	1		1		6	2
Cassin's Kingbird	*Tyrannus vociferans*	IRR			8					4	2
Dusky Flycatcher	*Empidonax oberholseri*	M			2					1	1
Gray Flycatcher	*Empidonax wrightii*	M			12					1	1
Olive-sided Flycatcher	*Contopus cooperi*	M		SSC	1					1	1
Pacific Slope Flycatcher	*Empidonax difficilis*	M			12					2	1
Say's Phoebe	*Sayornis saya*	W			54					2	1
Western Kingbird	*Tyrannus verticalis*	S			155					5	1
Western Wood-Pewee	*Contopus sordidulus*	M			9					2	1
Willow Flycatcher	*Empidonax traillii*	M	BCC	SE	4					1	1
Verdins											
Verdin	*Auriparus flaviceps*	YR			704	1		1	3	7	1
Larks											
Horned Lark	*Eremophila alpestris*	YR		WL	377	4		4	1	15	1
Swallows											
Bank Swallow	*Riparia riparia*	M		ST	2	1		1		15	6
Barn Swallow	*Hirundo rustica*	M			153	9		9		26	2
Cliff Swallow	*Petrochelidon pyrrhonota*	M			223	49		49		35	4
Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*	YR			90	5		5		23	2

Table 7 Flock Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-flock (1-5 Individuals)	Small Flock (6-50 Individuals)	Large Flock (>50 Individuals)	Total number of Flocks	Insufficient Data	Maximum Flock Size	Average Number of Individuals per Observation
			Federal	State							
Purple Martin	*Progne subis*	IRR		SSC	1					1	1
Tree Swallow	*Tachycineta bicolor*	W			180	46	1	47		300	5
Violet-Green Swallow	*Tachycineta thalassina*	M			37	15		15		20	5
Jays and Crows											
American Crow	*Corvus brachyrhynchos*	IRR			1					1	1
Common Raven	*Corvus corax*	YR			62	1		1		7	1
Wrens											
Bewick's Wren	*Thryomanes bewickii*	W			8					1	1
Cactus Wren	*Campylorhynchus brunneicapillus*	YR			334				4	3	1
Canyon Wren	*Catherpes mexicanus*	YR			2					1	1
Marsh Wren	*Cistothorus palustris*	YR			3					1	1
Rock Wren	*Salpinctes obsoletus*	YR			10					2	1
Mockingbirds and Thrashers											
Crissal Thrasher	*Toxostoma crissale*	YR		SSC	20					2	1
Le Conte's Thrasher	*Toxostoma lecontei*	YR	BCC	SSC	15					2	1
Northern Mockingbird	*Mimus polyglottos*	YR			71				2	3	1
Sage Thrasher	*Oreoscoptes montanus*	W			51	1		1		6	1
Thrushes											
Mountain Bluebird	*Sialia currucoides*	W			11	2		2		20	4
Western Bluebird	*Sialia mexicana*	W			1	1		1		2	2
Gnatcatchers and Kinglets											
Black-Tailed Gnatcatcher	*Polioptila melanura*	YR			315	1		1		11	1

Table 7 Flock Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-flock (1-5 Individuals)	Small Flock (6-50 Individuals)	Large Flock (>50 Individuals)	Total number of Flocks	Insufficient Data	Maximum Flock Size	Average Number of Individuals per Observation
			Federal	State							
Blue-Gray Gnatcatcher	*Polioptila caerulea*	W			4					1	1
Ruby-Crowned Kinglet	*Regulus calendula*	W			1					1	1
Pipits											
American Pipit	*Anthus rubescens*	W			2					1	1
Phainopeplas											
Phainopepla	*Phainopepla nitens*	S			134	3		3		11	1
Shrikes											
Loggerhead Shrike	*Lanius ludovicianus*	YR	BCC	SSC	423				2	4	1
Starlings											
European Starling	*Sturnus vulgaris*	YR			4		1	1		100	22
Warblers											
Black-Throated Gray Warbler	*Setophaga nigrescens*	M			3					1	1
Common Yellowthroat	*Geothlypis trichas*	M			3					1	1
Lucy's Warbler	*Oreothlypis luciae*	S	BCC	SSC	20					1	1
MacGillivray's Warbler	*Geothlypis tolmiei*	M			8					1	1
Nashville Warbler	*Oreothlypis ruficapilla*	M			14					5	2
Orange-Crowned Warbler	*Oreothlypis celata*	M			37					4	1
Townsend's Warbler	*Setophaga townsendi*	M			13					3	1
Wilson's Warbler	*Cardellina pusilla*	M			44	1		1		7	2
Yellow Warbler	*Setophaga petechia*	M	BCC	SSC	12					2	1
Yellow-Rumped Warbler	*Setophaga coronata*	W			59	1		1		6	2
Vireos											
Warbling Vireo	*Vireo gilvus*	M			29					3	1

Table 7 Flock Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-flock (1-5 Individuals)	Small Flock (6-50 Individuals)	Large Flock (>50 Individuals)	Total number of Flocks	Insufficient Data	Maximum Flock Size	Average Number of Individuals per Observation
			Federal	State							
Old World Sparrows											
House Sparrow	*Passer domesticus*	YR			2					1	1
Blackbirds and Orioles											
Brewer's Blackbird	*Euphagus cyanocephalus*	W			13	15	1	16		200	14
Brown-Headed Cowbird	*Molothrus ater*	YR			97	18		18	1	20	3
Bullock's Oriole	*Icterus bullockii*	S			15					3	1
Great-Tailed Grackle	*Quiscalus mexicanus*	YR			3	4		4		26	8
Hooded Oriole	*Icterus cucullatus*	S			2					1	1
Red-Winged Blackbird	*Agelaius phoeniceus*	YR			113	90	4	94	5	300	10
Scott's Oriole	*Icterus parisorum*	M			1					1	1
Western Meadowlark	*Sturnella neglecta*	YR			21					4	1
Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*	YR		SSC	50	51	11	62	9	300	25
Tanagers											
Western Tanager	*Piranga ludoviciana*	M			21					2	1
Cardinals, Sparrows and Finches											
Black-Headed Grosbeak	*Pheucticus melanocephalus*	M			16					1	1
Black-Throated Sparrow	*Amphispiza bilineata*	YR			31					3	2
Blue Grosbeak	*Passerina caerulea*	S			1					1	1
Brewer's Sparrow	*Spizella breweri*	W	BCC		97	4		4		35	3
Chipping Sparrow	*Spizella passerina*	W			6	1		1		6	2
Dark-Eyed Junco	*Junco hyemalis*	W			1					1	1

Table 7 Flock Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-flock (1-5 Individuals)	Small Flock (6-50 Individuals)	Large Flock (>50 Individuals)	Total number of Flocks	Insufficient Data	Maximum Flock Size	Average Number of Individuals per Observation
			Federal	State							
House Finch	*Haemorhous mexicanus*	YR			180	4		4		41	2
Indigo Bunting	*Passerina cyanea*	M			1					1	1
Lazuli Bunting	*Passerina amoena*	S			4					1	1
Lesser Goldfinch	*Spinus psaltria*	YR			22					2	1
Sage Sparrow	*Artemisiospiza belli*	W			92	2		2	2	6	2
Savannah Sparrow	*Passerculus sandwichensis*	W			1					1	1
Song Sparrow	*Melospiza melodia*	YR			2					3	2
White-Crowned Sparrow	*Zonotrichia leucophrys*	W			40	3		3		9	3
Total					9676	550	43	593	43	max= 350	average= 3
Percentage of Total Count					94.23	5.36	0.42				

SE - State Endangered (California Endangered Species Act)
ST - State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (United States Fish and Wildlife Service)
FP - Fully Protected (California Department of Fish and Game)
SSC - Species of Special Concern (California Department of Fish and Game)
WL - Watch List (California Department of Fish and Game)

Resdient Status*
M-migrant
S- summer resident
W- winter resident
YR- year-round residnet
IRR- irregular/rare

Table 8 Sensitive Species Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-Raptor Observation Points	Raptor Observation Points	Bird Transects	Grand Total
			Federal	State				
Waterbirds								
Shorebirds & Relatives	**Order Charadriiformes**							
Long-billed Curlew	*Numenius americanus*	W	BCC	WL		1		1
Ibises and Relatives	**Order Ciconiiformes**							
White-Faced Ibis	*Plegadis chihi*	M		WL	162	1,001		1,163
Cranes, Rails and Relatives	**Order Gruiformes**							
Sandhill Crane	*Grus canadensis*	W		ST, FP	34			34
Totipalmates	**Order Pelecaniformes**							
American White Pelican	*Pelecanus erythrorhynchos*	W		SSC	1			1
Cormorants	**Order Suliformes**							
Double-Crested Cormorant	*Phalacrocorax auritus*	YR		WL	94	22	60	176
Raptors								
Vultures & Hawks	**Order Accipitriformes**							
Cooper's Hawk	*Accipiter cooperii*	W		WL	7	18	2	27
Ferruginous Hawk	*Buteo regalis*	W	BCC	WL	2			2
Northern Harrier	*Circus cyaneus*	W		SSC	29	19	1	49
Osprey	*Pandion haliaetus*	W		WL	6	24		30
Swainson's Hawk	*Buteo swainsoni*	M	BCC	ST	18	46		64
Falcons & Eagles	**Order Falconiformes**							
Golden Eagle	*Aquila chrysaetos*	YR	BCC	FP, WL		1		1
Merlin	*Falco columbarius*	W		WL	1	1		2
Peregrine Falcon	*Falco peregrinus*	YR	BCC	FP	7	1	1	9
Prairie Falcon	*Falco mexicanus*	YR	BCC	WL	28	18	2	48
Other Non-Passerines								
Swifts	**Order Apodiformes**							
Vaux's Swift	*Chaetura vauxi*	YR		SSC	9		3	12

Table 8 Sensitive Species Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-Raptor Observation Points	Raptor Observation Points	Bird Transects	Grand Total
			Federal	State				
Woodpeckers and Relatives	**Order Piciformes**							
Lewis's Woodpecker	*Melanerpes lewis*	W	BCC				1	1
Passerines								
Perchingbirds	**Order Passeriformes**							
Flycatchers								
Olive-Sided Flycatcher	*Contopus cooperi*	M	BCC	SSC			1	1
Willow Flycatcher	*Empidonax traillii*	M	BCC	SE	2		2	4
Larks								
Horned Lark	*Eremophila alpestris*	YR		WL	296	121	119	536
Swallows								
Bank Swallow	*Riparia riparia*	M		ST		19		19
Purple Martin	*Progne subis*	IRR		SSC		1		1
Mockingbirds and Thrashers								
Crissal Thrasher	*Toxostoma crissale*	YR		SSC	17	1	4	22
Le Conte's Thrasher	*Toxostoma lecontei*	YR	BCC	SSC	7	5	6	18
Shrikes								
Loggerhead Shrike	*Lanius ludovicianus*	YR	BCC	SSC	129	223	103	455
Warblers								
Lucy's Warbler	*Oreothlypis luciae*	S	BCC	SSC	7		13	20
Yellow Warbler	*Setophaga petechia*	M	BCC	SSC	6		8	14
Blackbirds and Orioles								
Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*	YR		SSC	2,618	2	183	2,803
Cardinals, Sparrows and Finches								
Brewer's Sparrow	*Spizella breweri*	W	BCC		137	106	19	262

Table 8 Sensitive Species Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-Raptor Observation Points	Raptor Observation Points	Bird Transects	Grand Total
			Federal	State				
Totals Individuals Observed					**3,617**	**1,630**	**528**	**5,775**
Total Number of Species					**22**	**19**	**17**	**28**
Number of Survey Days					**43**	**31**	**6**	**80**
Average Number of Observations Per Survey Day					**84**	**53**	**88**	**72**

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ST - State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (United States Fish and Wildlife Service)
FP - Fully Protected (California Department of Fish and Game)
SSC - Species of Special Concern (California Department of Fish and Game)
WL - Watch List (California Department of Fish and Game)
= Over 100 individuals observed

Resdient Status*
M-migrant
S- summer resident
W- winter resident
YR- year-round residnet
IRR- irregular/rare

Table 9 Waterbird Species Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-Raptor Observation Points	Raptor Observation Points	Bird Transects	Grand Total
			Federal	State				
Waterbirds								
Waterfowl	**Order Anseriformes**							
Mallard	*Anas platyrhynchos*	W			2			2
Shorebirds & Relatives	**Order Charadriiformes**							
Black Tern	*Chlidonias niger*	M		SSC				0
Black-Necked Stilt	*Himantopus mexicanus*	S			3			3
Greater Yellowlegs	*Tringa melanoleuca*	W				1		1
Killdeer	*Charadrius vociferus*	YR			18			18
Least Sandpiper	*Calidris minutilla*	W				1		1
Long-billed Curlew	*Numenius americanus*	W	BCC	WL		1		1
Ibises and Relatives	**Order Ciconiiformes**							
White-Faced Ibis	*Plegadis chihi*	M		WL	162	1,001		1,163
Cranes, Rails and Relatives	**Order Gruiformes**							
American Coot	*Fulica americana*	YR			3			3
Sandhill Crane	*Grus canadensis*	W		ST, FP	34			34
Totipalmates	**Order Pelecaniformes**							
American White Pelican	*Pelecanus erythrorhynchos*	W		SSC	1			1
Great Blue Heron	*Ardea herodias*	YR			3	2		5
Great Egret	*Ardea alba*	YR			26		1	27
Cormorants	**Order Suliformes**							
Double-Crested Cormorant	*Phalacrocorax auritus*	YR		WL	94	22	60	176
Totals Individuals Observed					**346**	**1,028**	**61**	**1,435**
Total Number of Species					**10**	**6**	**2**	**14**

SE - State Endangered (California Endangered Species Act)
ST - State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (United States Fish and Wildlife Service)
FP - Fully Protected (California Department of Fish and Game)

Resdient Status*
M-migrant
S- summer resident
W- winter resident

Table 9 Waterbird Species Observations During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Common Name	Scientific Name	Resident Status*	Special Status		Non-Raptor Observation Points	Raptor Observation Points	Bird Transects	Grand Total
			Federal	State				

SSC - Species of Special Concern (California Department of Fish and Game)
WL - Watch List (California Department of Fish and Game)
= Over 100 individuals observed
YR- year-round resident
IRR- irregular/rare

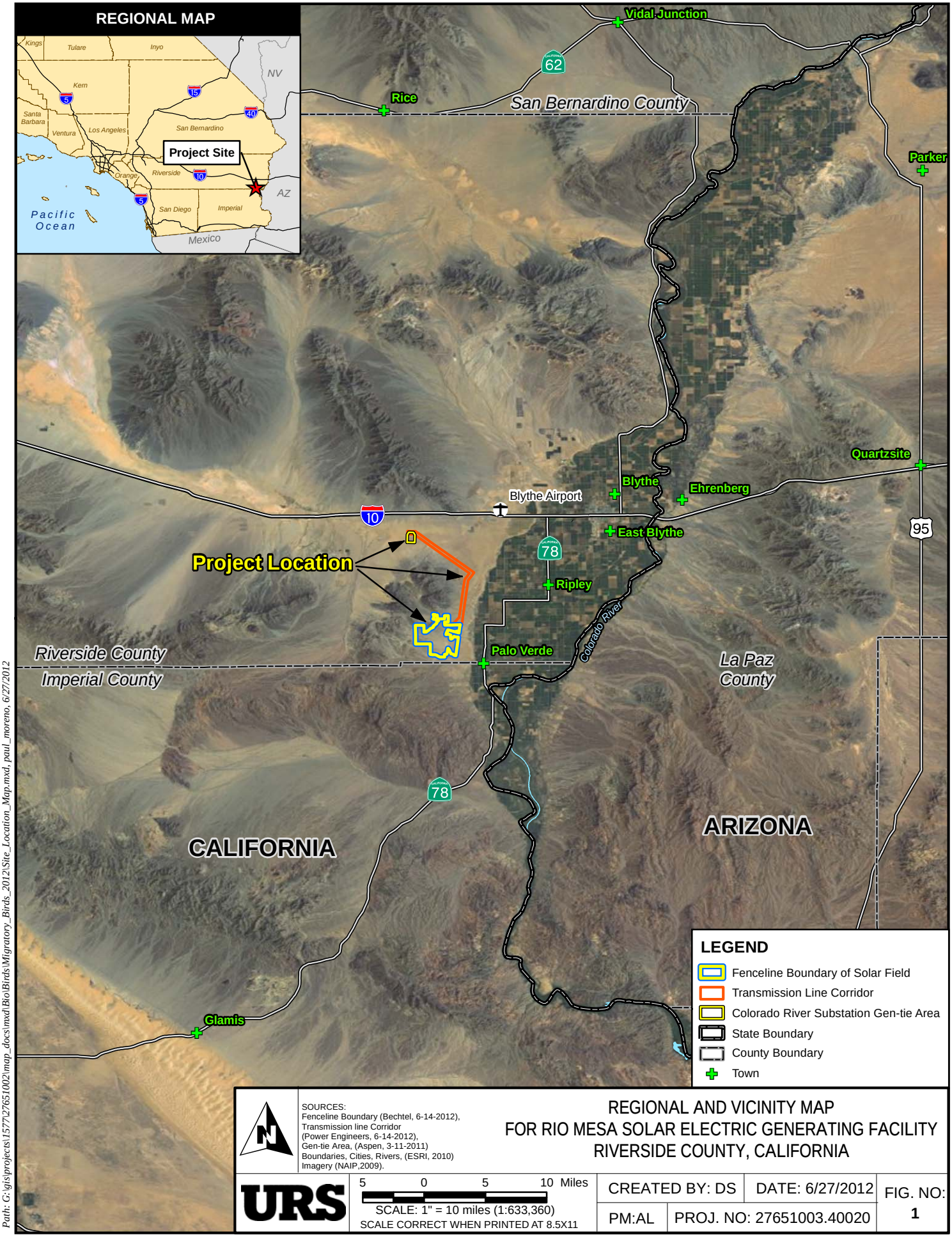
Table 10 Comparison of Residency Status of Birds Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Observation Points	# species	# observations	% of total
Migrants	23	2851	12.6
Summer Residents	11	816	3.6
Winter Residents	30	2556	11.3
Year-round Resident	49	16360	72.4
Irregular/Rare	1	1	0.0

Transect Surveys	# species	# observations	% of total
Migrants	18	225	5.2
Summer Residents	6	513	11.9
Winter Residents	11	121	2.8
Year-round Resident	37	3429	79.7
Irregular/Rare	1	17	0.4

Table 11 Comparison of Flight Height and Direction Between Residency Status of Birds Observed During Spring 2012 Fixed-Point Observation and Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project

Status	Average Flight Height (m)	E	N	NE	NW	S	SE	SW	W
Migrant	16.27	14	16	6	8	12	5	3	16
Summer Resident	26.45	9	9	3	9	7	5	7	9
Winter Resident	41.20	13	18	9	13	16	8	9	18
Year-round Resident	34.36	34	36	23	25	32	22	21	32
Irregular/Rare	20.88	1	0	0	0	0	0	2	1


REGIONAL MAP
Project Site
Pacific Ocean
Mexico
NV
AZ
Vidal Junction
Rice
San Bernardino County
Parker
Quartzsite
Blythe
Ehrenberg
Blythe Airport
East Blythe
Project Location
Ripley
Palo Verde
Colorado River
Riverside County
Imperial County
La Paz County
CALIFORNIA
ARIZONA
Glamis
LEGEND
Fenceline Boundary of Solar Field
Transmission Line Corridor
Colorado River Substation Gen-tie Area
State Boundary
County Boundary
Town
SOURCES:
Fenceline Boundary (Bechtel, 6-14-2012),
Transmission line Corridor
(Power Engineers, 6-14-2012),
Gen-tie Area, (Aspen, 3-11-2011)
Boundaries, Cities, Rivers, (ESRI, 2010)
Imagery (NAIP,2009).
REGIONAL AND VICINITY MAP
FOR RIO MESA SOLAR ELECTRIC GENERATING FACILITY
RIVERSIDE COUNTY, CALIFORNIA
URS
5 0 5 10 Miles
SCALE: 1" = 10 miles (1:633,360)
SCALE CORRECT WHEN PRINTED AT 8.5X11
CREATED BY: DS
DATE: 6/27/2012
PM:AL
PROJ. NO: 27651003.40020
FIG. NO: 1
Path: G:\gis\projects\157\27651002\map_docs\mxd\BioBirds\Migratory_Birds_2012\Site_Location_Map.mxd, paul_moreno, 6/27/2012

Radar Location
Radar Location 1.5km Buffer
Tower Location
Raptor Observation Point
Non-Raptor Observation Point

Project Features

Fenceline Boundary of Solar Field (3,805 acres)
*Includes Common Areas, Switchyard and Gas Metering Yard
Common Areas Boundary (19.5 acres) *Included in Fenceline acres
Switchyard (2.47 acres) *Included in Fenceline acres
Gas Metering Yard (0.52 acres) *Included in Fenceline acres
Temporary Construction Logistics Area (103 acres)
Additional Area of Original Fenceline Boundary
ROW Corridor approx. 1,641 ac.
(1,300 ft. corridor, approx 650ft. from c/l; approx acres: 1196 BLM, 445 Private)

Private Parcels

No Right of Entry
County Boundary
Bradshaw Trail
Microphyll Woodland

1B
1R
2B
2R
Tower Location
Tower Location
3B
4B
3R
Bradshaw Trail
Riverside County
Imperial County
bing

Path: G:\gis\projects\15772765\1002\map_docs\mxd\Bio\Birds\Migratory_Birds_2012\Migratory_Bird_Observations_2012_zoom.mxd, Lauren_Rizzo, 8/10/2012, 3:11:57 PM

SOURCES: Fenceline (Bechtel, 6-13-2012).
Transmission Line Corridor (URS, 6-14-2012).
Private Lands (BSE, 2012).
Aerial Imagery (Bing Maps, 2011).
County, Bradshaw Trail, Highway (ESRI, 2007).
Bird Observation Points,
Microphyll Woodland (URS, 2012).
Radar (West, 2012)

2012 MIGRATORY BIRD OBSERVATION POINT LOCATIONS FOR RIO MESA SOLAR ELECTRIC GENERATING FACILITY

URS

1750 0 1750 3500 Feet
SCALE: 1" = 3,500' (1:42,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: 8/10/2012	FIG. NO: 2
PM: AL	PROJ. NO: 27651003.20110	

Tower Location

Bird Survey Points

Bird Transects

Project Features

Fenceline Boundary of Solar Field (3,805 acres)
*Includes Common Areas, Switchyard and Gas Metering Yard

Common Areas Boundary (19.5 acres) *Included in Fenceline acres

Switchyard (2.47 acres) *Included in Fenceline acres

Gas Metering Yard (0.52 acres) *Included in Fenceline acres

Temporary Construction Logistics Area (103 acres)

Additional Area of Original Fenceline Boundary

ROW Corridor approx. 1,641 ac.
(1,300 ft. corridor, approx 650ft. from c/l; approx acres: 1196 BLM, 445 Private)

Private Parcels

No Right of Entry

County Boundary

Bradshaw Trail

Microphyll Woodland

M8 M7 M6 M5 M4 M3 M2 M1

L8 L7 L6 L5 L4 L3 L2 L1

K8 K7 K6 K5 K4 K3 K2 K1

Bradshaw Trail

I8 I7 I6 I5 I4 I3 I2 I1

J8 J7 J6 J5 J4 J3 J2 J1

N8 N7 N6 N5 N4 N3 N2 N1

B1 B2 B3 B4 B5 B6 B7 B8

C1 C2 C3 C4 C5 C6 C7 C8

D1 D2 D3 D4 D5 D6 D7 D8

O8 O7 O6 O5 O4 O3 O2 O1

A1 A2 A3 A4 A5 A6 A7 A8

H8 H7 H6 H5 H4 H3 H2 H1

P8 P7 P6 P5 P4 P3 P2 P1

E1 E2 E3 E4 E5 E6 E7 E8

G8 G7 G6 G5 G4 G3 G2 G1

F7 F6 F5 F4 F3 F2 F8 F1

Tower Location

Tower Location

Riverside County

Imperial County

SOURCES: Fenceline (Bechtel, 6-13-2012).
Transmission Line Corridor (URS, 6-14-2012).
Private Lands (BSE, 2012).
Aerial Imagery (Bing Maps, 2011).
County, Bradshaw Trail, Highway (ESRI, 2007).
Bird Transects, Survey Points,
Microphyll Woodland (URS, 2012).

2012 MIGRATORY BIRD POINT COUNT TRANSECT LOCATIONS FOR RIO MESA SOLAR ELECTRIC GENERATING FACILITY

URS

1750 0 1750 3500 Feet

SCALE: 1" = 3,500' (1:42,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: 7/2/2012	FIG. NO: 3
PM: AL	PROJ. NO: 27651003.20110	

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Migratory Bird Survey Points

Number of Observations (excludes fly-overs and observations of 100 meters from point)

- 0-10
- 11-20
- 21-30
- 31-40
- Tower Location
- Bird Transects

Project Features

- Fenceline Boundary of Solar Field (3,805 acres) *Includes Common Areas, Switchyard and Gas Metering Yard
- Common Areas Boundary (19.5 acres) *Included in Fenceline acres
- Switchyard (2.47 acres) *Included in Fenceline acres
- Gas Metering Yard (0.52 acres) *Included in Fenceline acres
- Temporary Construction Logistics Area (103 acres)
- Additional Area of Original Fenceline Boundary
- ROW Corridor approx. 1,641 ac. (1,300 ft. corridor, approx 650ft. from c/l; approx acres: 1196 BLM, 445 Private)

Private Parcels

- No Right of Entry
- County Boundary
- Bradshaw Trail
- Microphyll Woodland

Bradshaw Trail

Tower Location

Tower Location

Riverside County

Imperial County

bing™

SOURCES: Fenceline (Bechtel, 6-13-2012).
Transmission Line Corridor (URS, 6-14-2012).
Private Lands (BSE, 2012).
Aerial Imagery (Bing Maps, 2011).
County, Bradshaw Trail, Highway (ESRI, 2007).
Bird Transects, Survey Points,
Microphyll Woodland (URS, 2012).

AREAS OF HIGH USE DURING SPRING 2012 TRANSECT SURVEYS AT RIO MESA SOLAR ELECTRIC GENERATING FACILITY

URS

1750 0 1750 3500 Feet

SCALE: 1" = 3,500' (1:42,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: 8/10/2012	FIG. NO: 4
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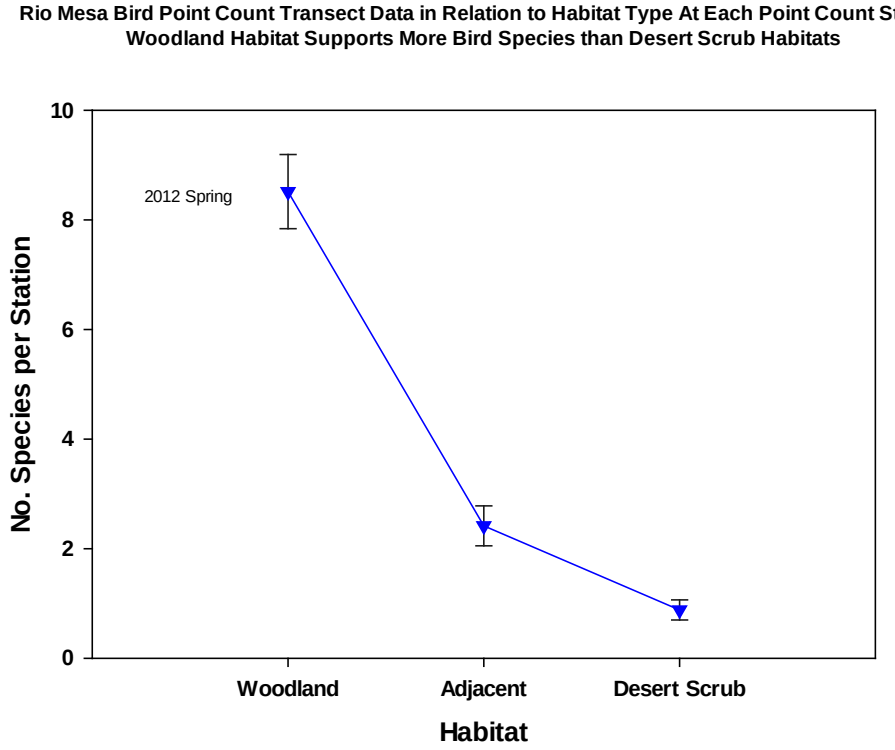
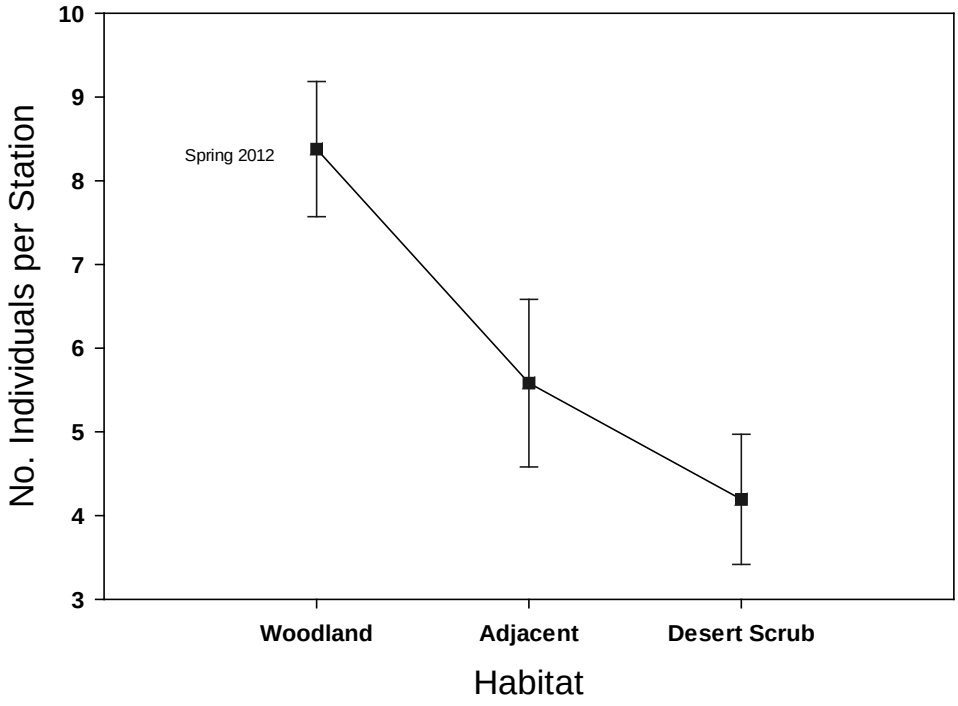
Figure 4b: Comparison of Microphyll Woodland Use During Spring 2012 Transect Point Counts at the Rio Mesa Solar Electric Generating Facility Project





Bird Observation Points

- Raptor Observation Point
- Non-Raptor Observation Point

Project Features

- Fenceline Boundary of Solar Field (3,805 acres) *Includes Common Areas, Switchyard and Gas Metering Yard
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- Tower Location

Private Parcels

- No Right of Entry
- County Boundary
- Bradshaw Trail
- Microphyll Woodland

1B
1R
Bradshaw Trail
2B
Tower Location
2R
3B
Tower Location
4B
3R
Riverside County
Imperial County

Spring 2012 Migratory Bird Observations: Large Flocks

(Species and Total Count)

- Brewer's Blackbird *(Euphagus cyanocephalus)* (200)
- Double-crested Cormorant *(Phalacrocorax auritus)* (60)
- European Starling *(Sturnus vulgaris)* (100)
- Red-winged Blackbird *(Agelaius phoeniceus)* (580)
- Tree Swallow *(Tachycineta bicolor)* (300)
- Turkey Vulture *(Cathartes aura)* (2,197)
- White-faced Ibis *(Plegadis chihi)* (960)
- Yellow-headed Blackbird *(Xanthocephalus xanthocephalus)* (1,755)

SOURCES: Fenceline (Bechtel, 6-13-2012).
Transmission Line Corridor (URS, 6-14-2012).
Private Lands (BSE, 2012).
Aerial Imagery (Bing Maps, 2011).
County, Bradshaw Trail, Highway (ESRI, 2007).
Bird Transects, Survey Points,
Microphyll Woodland (URS, 2012).

LOCATION OF LARGE FLOCKS (>51 INDIVIDUALS) OBSERVED DURING SPRING 2012 OBSERVATION POINTS AND TRANSECT SURVEYS AT RIO MESA SOLAR ELECTRIC GENERATING FACILITY

URS

1500 0 1500 3000 Feet

SCALE: 1" = 3,000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: 8/10/2012	FIG. NO: 5
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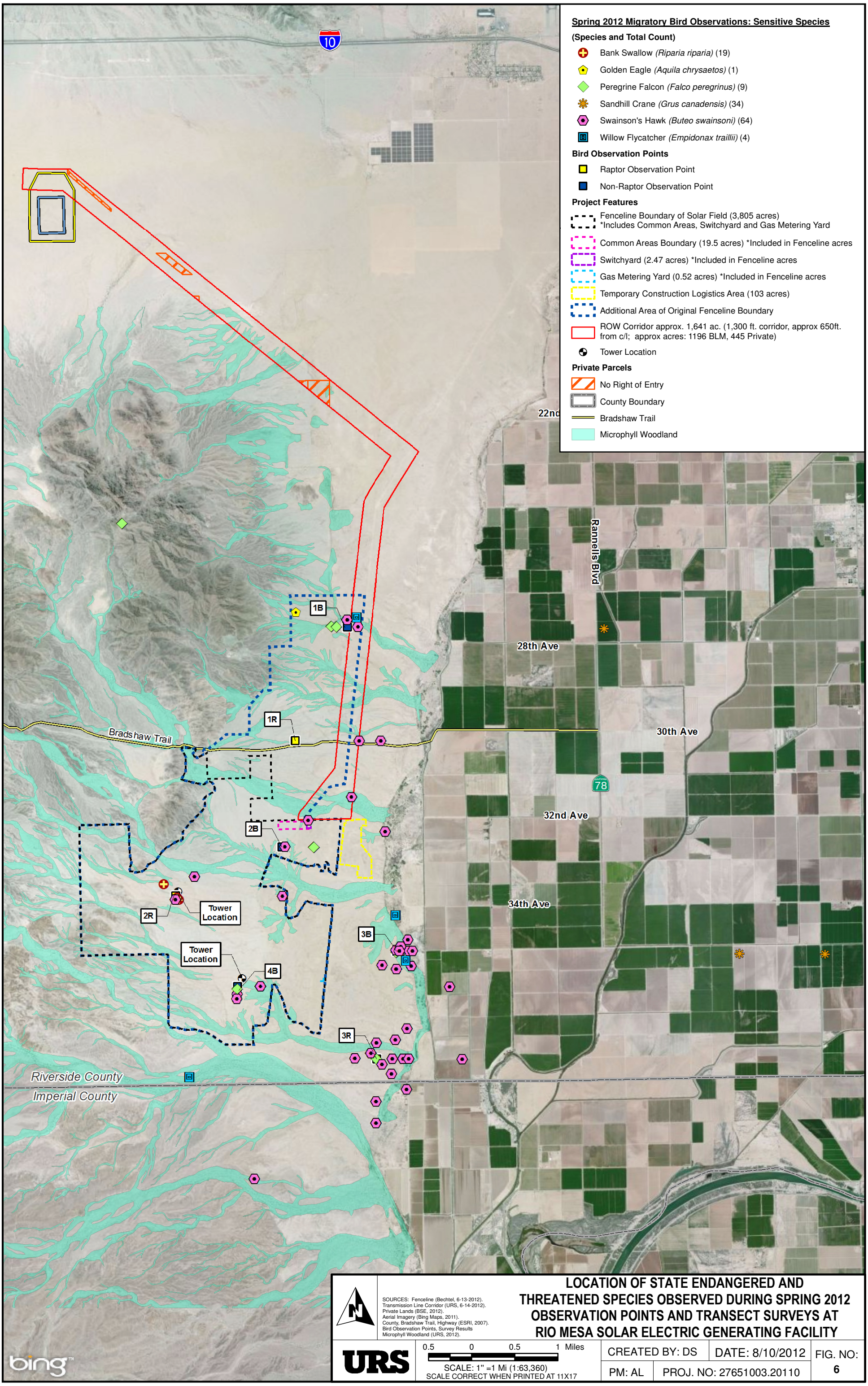

Spring 2012 Migratory Bird Observations: Sensitive Species

(Species and Total Count)

- Bank Swallow *(Riparia riparia)* (19)
- Golden Eagle *(Aquila chrysaetos)* (1)
- Peregrine Falcon *(Falco peregrinus)* (9)
- Sandhill Crane *(Grus canadensis)* (34)
- Swainson's Hawk *(Buteo swainsoni)* (64)
- Willow Flycatcher *(Empidonax traillii)* (4)

Bird Observation Points

- Raptor Observation Point
- Non-Raptor Observation Point

Project Features

- Fenceline Boundary of Solar Field (3,805 acres) *Includes Common Areas, Switchyard and Gas Metering Yard
- Common Areas Boundary (19.5 acres) *Included in Fenceline acres
- Switchyard (2.47 acres) *Included in Fenceline acres
- Gas Metering Yard (0.52 acres) *Included in Fenceline acres
- Temporary Construction Logistics Area (103 acres)
- Additional Area of Original Fenceline Boundary
- ROW Corridor approx. 1,641 ac. (1,300 ft. corridor, approx 650ft. from c/l; approx acres: 1196 BLM, 445 Private)
- Tower Location

Private Parcels

- No Right of Entry
- County Boundary
- Bradshaw Trail
- Microphyll Woodland

SOURCES: Fenceline (Bechtel, 6-13-2012).
Transmission Line Corridor (URS, 6-14-2012).
Private Lands (BSE, 2012).
Aerial Imagery (Bing Maps, 2011).
County, Bradshaw Trail, Highway (ESRI, 2007).
Bird Observation Points, Survey Results
Microphyll Woodland (URS, 2012).

LOCATION OF STATE ENDANGERED AND THREATENED SPECIES OBSERVED DURING SPRING 2012 OBSERVATION POINTS AND TRANSECT SURVEYS AT RIO MESA SOLAR ELECTRIC GENERATING FACILITY

URS

0.5 0 0.5 1 Miles

SCALE: 1" =1 Mi (1:63,360)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: 8/10/2012	FIG. NO: 6
PM: AL	PROJ. NO: 27651003.20110	

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Spring 2012 Migratory Bird Observations: Water Birds

(Species and Total Count)

- American Coot *(Fulica americana)* (3)
- American White Pelican *(Pelecanus erythrorhynchos)* (1)
- Black-Necked Stilt *(Himantopus mexicanus)* (3)
- Double-Crested Cormorant *(Phalacrocorax auritus)* (176)
- Great Blue Heron *(Ardea herodias)* (4)
- Great Egret *(Ardea alba)* (20)
- Greater Yellowlegs *(Tringa melanoleuca)* (1)
- Killdeer *(Charadrius vociferus)* (18)
- Least Sandpiper *(Calidris minutilla)* (1)
- Long-billed Curlew *(Numenius americanus)* (1)
- Mallard *(Anas platyrhynchos)* (2)
- Sandhill Crane *(Grus canadensis)* (34)
- White-Faced Ibis *(Plegadis chihi)* (1,163)

Bird Observation Points

- Raptor Observation Point
- Non-Raptor Observation Point

Project Features

- Fenceline Boundary of Solar Field (3,805 acres) *Includes Common Areas, Switchyard and Gas Metering Yard
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- Tower Location

Private Parcels

- No Right of Entry
- County Boundary
- Bradshaw Trail
- Microphyll Woodland

1B
1R
2B
2R
3B
3R
4B
Tower Location
Tower Location
10
78
Bradshaw Trail
28th Ave
30th Ave
32nd Ave
34th Ave
Riverside County
Imperial County
bing

SOURCES: Fenceline (Bechtel, 6-13-2012).
Transmission Line Corridor (URS, 6-14-2012).
Private Lands (BSE, 2012).
Aerial Imagery (Bing Maps, 2011).
County, Bradshaw Trail, Highway (ESRI, 2007).
Bird Observation Points, Survey Results
Microphyll Woodland (URS, 2012).

LOCATION OF WATERBIRD SPECIES OBSERVED DURING SPRING 2012 OBSERVATION POINTS AND TRANSECT SURVEYS AT RIO MESA SOLAR ELECTRIC GENERATING FACILITY

URS

0.5 0 0.5 1 Miles

SCALE: 1" =1 Mi (1:63,360)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: 8/10/2012	FIG. NO:
PM: AL	PROJ. NO: 27651003.20110	7

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Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
1	2/21/2012	1B	JK	0600	1400	45	77.5	3	NE	5	NE	5	0
1	2/21/2012	2B	RB	0600	1400	45	77.5	3	NE	5	NE	5	0
1	2/21/2012	3B	HR, RR	0600	1400	45	77.5	3	NE	5	NE	5	0
1	2/21/2012	4B	JAS	0600	1400	45	77.5	3	NE	5	NE	5	0
1	2/22/2012	1B	JK	0600	1400	50	84	1-3.5	NW	3.5	N	5	10
1	2/22/2012	2B	RB	0600	1400	50	84	1-3.5	NW	3.5	N	5	10
1	2/22/2012	3B	HR, RR	0600	1400	50	84	1-3.5	NW	3.5	N	5	10
1	2/22/2012	4B	JAS	0600	1400	50	84	1-3.5	NW	3.5	N	5	10
1	2/23/2012	1B	HR, RR	0600	1400	47	84	1.5	NW	3.5	N	0	5
1	2/23/2012	2B	JAS	0600	1400	47	84	1.5	NW	3.5	N	0	5
1	2/23/2012	3B	RB	0600	1400	47	84	1.5	NW	3.5	N	0	5
1	2/23/2012	4B	JK	0620	1420	52	86	1-3.5	NW	3.5	N	0	20
2	2/29/2012	1B	RB	1000	1800	63.4	63.8	2	SE	3.7	SW	1	5
2	2/29/2012	2B	RR	1000	1745	65.1	66.8	3	SW	9	SW	7	0
2	2/29/2012	3B	JAS	1000	1800	65.1	66.8	2	NE	10	NE	5	1
2	2/29/2012	4B	HR	1010	1750	65.1	66.8	2	NE	10	NE	5	1
2	3/1/2012	1B	HR	0900	1700	72	69	1	NE	16	SW	0	2
2	3/1/2012	2B	JAS	0910	1710	72	69	1	NE	16	SW	0	2
2	3/1/2012	3B	RR	0910	1710	72	69	1	NE	16	SW	0	2
2	3/1/2012	4B	RB	0910	1710	62.4	71.3	1.1	SE	15.9	SW	0	2
2	3/2/2012	Surveys cancelled due to weather conditions											
3	3/5/2012	1B	JAS	1000	1745	62.4	78.5	1.4	N	2.1	NE	90	30

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
3	3/5/2012	2B	IK	1000	1800	62.4	78.5	1.4	N	2.1	NE	90	30
3	3/5/2012	3B	JSw	1018	1818	62.4	78.5	1.4	N	2.1	NE	90	30
3	3/5/2012	4B	RR	1015	1815	62.4	78.5	1.4	N	2.1	NE	90	30
3	3/6/2012	1B	RR	0550	1350	56.8	83	2.8	SW	17.8	SW	20	50
3	3/6/2012	2B	JSw	0608	1408	56.8	83	2.8	SW	17.8	SW	20	50
3	3/6/2012	3B	IK	0600	1400	62	83	16	S	20	SW	10	60
3	3/6/2012	4B	JAS	0600	1400	56.8	83	2.8	SW	17.8	SW	20	50
3	3/7/2012	1B	JSw	0552	1352	56.8	83	2.8	SW	17.8	SW	20	50
3	3/7/2012	2B	RR	0605	1405	49.9	66	12	NW	9.5	NW	5	0
3	3/7/2012	3B	JAS	0600	1400	56.8	83	2.8	SW	17.8	SW	20	50
3	3/7/2012	4B	IK	0600	1400	48	83	17	NW	17.8	SW	30	50
4	3/12/2012	1B	IK	1015	1815	67	81	1	NW	11	S	5	5
4	3/12/2012	2B	JSw	1035	1835	75	79.7	4	SE	3.3	SE	3	3.3
4	3/12/2012	3B	PH	1015	1840	75	79.7	4	SE	3.3	SE	3	3.3
4	3/12/2012	4B	RR	1030	1830	75	79.7	4	SE	3.3	SE	3	3.3
4	3/13/2012	1B	RR	1015	1815	81	80	1.5	SE	5	S	1	0
4	3/13/2012	2B	PH	1020	1820	81	80	1.5	SE	5	S	1	0
4	3/13/2012	3B	IK	1030	1830	69	76	2	SW	12	SW	3	0
4	3/13/2012	4B	JSw	1030	1830	69	80	1.5	SE	5	S	1	0
4	3/14/2012	1B	PH	0725	1525	87.3	71	1.7	SE	2	NW	0	0
4	3/14/2012	2B	RR	0735	1535	87.3	71	1.7	SE	2	NW	0	0
4	3/14/2012	3B	JSw	0730	1530	54	71	6	WNW	2	NW	20	0
4	3/14/2012	4B	IK	0730	1530	53	81	7	NW	6	S	20	5
5	3/19/2012	1B	RR	1015	1830	60.8	63	2.1	NE	5.5	NE	2	0

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
5	3/19/2012	2B	PH	1240	1815	60.8	63	2.1	NE	5.5	NE	2	0
5	3/19/2012	3B	KR	1245	1815	60.8	63	2.1	NE	5.5	NE	2	0
5	3/19/2012	4B	JK	1025	1825	58	63	3.5	W	5-7	NE	40	100
5	3/20/2012	1B	JK	0650	1450	45	75	1-3	NW	5-7	E	0	0
5	3/20/2012	2B	KR	0700	1500	50.5	77	1.5	E	4.5	N	0	0
5	3/20/2012	3B	PH	0700	1500	50.5	77	1.5	E	4.5	N	0	0
5	3/20/2012	4B	RR	0710	1510	50.5	77	1.5	E	4.5	N	0	0
5	3/21/2012	1B	KR	0655	1500	54.9	82	1	W	3.2	SW	0	0
5	3/21/2012	2B	RR	0705	1505	54.9	82	1	W	3.2	SW	0	0
5	3/21/2012	3B	JK	0650	1450	50	86	1-3	NE	3-5	NE	0	0
5	3/21/2012	4B	PH	0700	1500	54.9	82	1	W	3.2	SW	0	0
6	3/26/2012	1B	RB	1030	1830	70	70	2.6	SE	1.4	E	2	0
6	3/26/2012	2B	PH	1015	1815	68	73	5	W	3	N	0	0
6	3/26/2012	3B	JSw	1030	1830	68	73	5	W	3	N	0	0
6	3/26/2012	4B	IK	1030	1830	65	71	1	SW	6	SW	0	0
6	3/27/2012	1B	IK	1030	1830	68	76	7	NW	10	SW	0	10
6	3/27/2012	2B	RB	1030	1830	75	80.6	1.8	SE	3.5	S	0	7
6	3/27/2012	3B	PH	1025	1825	75	80.6	1.8	SE	3.5	S	0	7
6	3/27/2012	4B	JSw	1030	1830	69	80.6	1.4	SE	3.5	S	0	7
6	3/28/2012	1B	JSw	0640	1440	51	87	0	0	5.6	NE	10	30
6	3/28/2012	2B	IK	0700	1500	57.4	89.1	0	0	5.6	NE	10	30
6	3/28/2012	3B	RB	0645	1445	50	80	1.1	E	3	E	10	40
6	3/28/2012	4B	PH	0645	1445	57	89	0	0	5.6	NE	10	30
7	4/4/2012	1B	JK	1030	1830	85	88	4	NE	7	SW	40	40

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
7	4/4/2012	2B	JSw	1050	1850	85	88	4	NE	7	SW	40	40
7	4/4/2012	3B	IK	1045	1845	77	79	8	SW	10	SW	30	50
7	4/4/2012	4B	PH	1030	1830	85	88	4	NE	7	SW	40	40
7	4/5/2012	1B	PH	630	1430	64.6	85	4	SW	13	SW	90	10
7	4/5/2012	2B	JK	630	1430	64.6	88	4	SW	10	SW	90	20
7	4/5/2012	3B	JSw	645	1445	65	85	4	SW	13	SW	90	10
7	4/5/2012	4B	IK	645	1445	62	85	6	SW	10	SW	90	0
7	4/6/2012	1B	IK	645	1445	53	77	19	NW	15	N	0	10
7	4/6/2012	2B	PH	645	1445	59	79	10	N	8	N	10	20
7	4/6/2012	3B	JK	635	1435	59	79	10	N	8	N	10	20
7	4/6/2012	4B	JSw	645	1445	52	79	10	N	8	N	10	20
8	4/10/2012	1B	JSw	1030	1830	87	87	11	SE	14	S	0	0
8	4/10/2012	2B	IK	1045	1845	87.6	87.4	11.6	SE	14.7	S	0	0
8	4/10/2012	3B	PH	1050	1850	87	87	11	SE	14	S	0	0
8	4/10/2012	4B	SMR	1045	1845	87	87	11	SE	14	S	0	0
8	4/11/2012	1B	SMR	1030	1830	70	72	15	SW	15	SW	50	7
8	4/11/2012	2B	JSw	1030	1830	70	72	15	SW	15	SW	48	7
8	4/11/2012	3B	IK	1030	1830	70	72	18	SW	15	SW	70	7
8	4/11/2012	4B	PH	1030	1830	70	72	15	SW	15	SW	50	7
8	4/12/2012	1B	PH	630	1430	58	75	9	SW	4	E	10	10
8	4/12/2012	2B	SMR	700	1500	58	75	9	SW	4	E	10	10
8	4/12/2012	3B	JSw	700	1500	58	75	9	SW	4	E	10	10
8	4/12/2012	4B	IK	645	1445	51	74	11	SW	8	SW	30	10
9	4/17/2012	1B	JK	1045	1845	90	93	1.7	NE	6.2	E	0	5

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
9	4/17/2012	2B	IK	1100	1900	90.3	93.6	1.7	NE	6.2	E	0	3
9	4/17/2012	3B	JSw	1045	1845	90	93	1.7	NE	6.2	E	0	3
9	4/17/2012	4B	PH	1045	1845	90	93	1.7	NE	6.2	E	0	3
9	4/18/2012	1B	PH	620	1420	62	93	1	NE	7	W	5	15
9	4/18/2012	2B	JK	625	1425	62	103	1	NE	7	W	5	15
9	4/18/2012	3B	IK	600	1400	59	93	5	E	7	W	10	15
9	4/18/2012	4B	JSw	600	1400	62	93	1	NE	7	W	5	15
9	4/19/2012	1B	JSw	645	1445	69	97	0	-	2	W	25	10
9	4/19/2012	2B	PH	630	1430	69	93	0	-	7	W	25	15
9	4/19/2012	3B	JK	632	1432	69	97	0	-	2	W	25	10
9	4/19/2012	4B	IK	600	1400	69	97	0	-	2	W	25	10
10	4/24/2012	1B	IK	1045	1845	85	91	3	E	7	SW	5	80
10	4/24/2012	2B	JSw	1045	1845	85	91	3	E	7	SW	5	80
10	4/24/2012	3B	PH	1055	1855	85	91	3	E	7	SW	5	80
10	4/24/2012	4B	SLK	1100	1900	85	99	3	-	3	-	5	8
10	4/25/2012	1B	SLK	1115	1915	85.7	86.5	8.2	NE	4.2	S	100	90
10	4/25/2012	2B	IK	1130	1930	85.7	86.5	8.2	NE	4.2	S	100	90
10	4/25/2012	3B	JSw	1120	1920	85.7	86.5	8.2	NE	4.2	S	100	90
10	4/25/2012	4B	PH	1115	1915	85.7	86.5	8.2	NE	4.2	S	100	90
10	4/26/2012	1B	PH	600	1400	70	79	12	SW	13	SW	100	1
10	4/26/2012	2B	SLK	600	1400	70	79	12	SW	13	SW	100	1
10	4/26/2012	3B	IK	600	1400	70	79	12	SW	13	SW	100	1
10	4/26/2012	4B	JSw	600	1400	70	79	12	SW	13	SW	100	1
11	5/1/2012	1B	SLK	1100	1900	89	90	8-10	SE	10-13	SSE	30	60

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
11	5/1/2012	2B	SMR	1100	1900	89	90	8-10	SE	10-13	SSE	30	60
11	5/1/2012	3B	JLL	1100	1900	89	89	4-10	S	12-18	S	0	70
11	5/1/2012	4B	PH	1100	1900	89	90	8-10	SE	10-13	SSE	30	60
11	5/2/2012	1B	PH	0550	1350	71	88	4-8	S	8-14	S	90	80
11	5/2/2012	2B	JLL	0635	1435	71	88	4-8	S	2-10	S	90	85
11	5/2/2012	3B	SMR	0600	1400	71	88	4-8	S	8-14	S	90	88
11	5/2/2012	4B	SLK	0609	1409	71	88	4-8	S	8-14	S	90	80
11	5/3/2012	1B	HR	0630	1430	65	94	2.5	SW	10.5	SW	5	2
11	5/3/2012	2B	PH	0600	1400	63.5	95	0	-	6	S	50	35
11	5/3/2012	3B	SLK	0600	1400	63.5	95	0	-	6	S	50	35
11	5/3/2012	4B	JLL	0600	1400	65	88	1-2	SE	6-12	S	0	0
12	5/8/2012	1B	RB	1100	1900	90.1	91.2	9	E	4-8	SW	40	5
12	5/8/2012	2B	JSw	1100	1900	90.1	91.2	8-12	NE	4-8	SW	5	5
12	5/8/2012	3B	PH	1100	1900	90.1	91.2	9	E	4-8	SW	40	5
12	5/8/2012	4B	IK	1100	1900	90.1	91.2	8-12	NE	4-8	SW	5	5
12	5/9/2012	1B	IK	1100	1900	92.1	91.5	4.7	E	1.1	S	2	5
12	5/9/2012	2B	RB	1115	1915	92.1	91.5	4.7	E	1.1	S	2	5
12	5/9/2012	3B	JSw	1100	1900	92.1	91.5	4.7	E	1.1	S	1	5
12	5/9/2012	4B	PH	1100	1900	92.1	91.5	4.7	E	1.1	S	1	5
12	5/10/2012	1B	SLK	0550	1350	70	90	0	-	5	W	80	10
12	5/10/2012	2B	IK	0600	1400	70	90	0	-	5	W	80	10
12	5/10/2012	3B	RB	0550	1350	70	90	0	-	5	W	80	10
12	5/10/2012	4B	JSw	0600	1400	70	90	0	-	5	W	80	10
13	5/15/2012	1B	JSw	0535	1335	75	106	3.5	E	6	S	0	0

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
13	5/15/2012	2B	SLK	0545	1345	75	106	3.5	E	6	S	0	0
13	5/15/2012	3B	IK	0545	1345	75	106	3.5	E	6	S	0	0
13	5/15/2012	4B	PH	0545	1345	75	106	3.5	E	6	S	0	0
13	5/16/2012	1B	PH	0530	1330	77.4	105.4	5-8	NW	1-4	SE	0	0
13	5/16/2012	2B	JSw	0545	1345	77.4	105.4	5-8	NW	1-4	SE	0	0
13	5/16/2012	3B	SLK	0540	1340	77.4	105.4	5-8	NW	1-4	SE	0	0
13	5/16/2012	4B	IK	0545	1345	77.4	105.4	5-8	NW	1-4	SE	0	0
13	5/17/2012	Surveys cancelled due to weather conditions											
14	5/22/2012	1B	SR	0530	1330	83.7	108	2.3	NW	4.3	W	30	10
14	5/22/2012	2B	IK	0530	1330	83.7	108	2.3	NW	4.3	W	30	10
14	5/22/2012	3B	JSw	0540	1340	83.7	108	2.3	NW	4.3	W	30	10
14	5/22/2012	4B	SLK	0530	1330	83.7	108	2.3	NW	4.3	W	30	10
14	5/23/2012	1B	SLK	0530	1130	78	98	3.5	NE	1.4	E	0	0
14	5/23/2012	2B	SR	0530	1130	78	98	3.5	NE	1.4	E	0	0
14	5/23/2012	3B	IK	0530	1130	78	98	3.5	NE	1.4	E	0	0
14	5/23/2012	4B	JSw	0540	1140	78	98	3.5	NE	1.4	E	0	0
14	5/24/2012	1B	JSw	0530	1130	70	98	6	E	2	E	0	0
14	5/24/2012	2B	SLK	0530	1130	70	99	6	E	3.3	E	0	0
14	5/24/2012	3B	SR	0530	1130	70	98	6	E	2	E	0	0
14	5/24/2012	4B	IK	0530	1130	70	98	6	E	2	E	0	0
15	5/29/2012	1B	SMR	0530	1130	66	96	5	SE	2	SE	0	0
15	5/29/2012	2B	JSw	0530	1130	66	96	5	SE	2	SE	0	0
15	5/29/2012	3B	IK	0530	1130	66	96	5	SE	2	SE	0	0

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
15	5/29/2012	4B	SR	0530	1130	66	96	0	0	2	SE	0	0
15	5/30/2012	1B	SR	0530	1130	73	97	1	E	3	W	0	0
15	5/30/2012	2B	SMR	0550	1150	73	97	1	E	3	W	0	0
15	5/30/2012	3B	PH	0530	1130	73	97	1	E	3	W	0	0
15	5/30/2012	4B	IK	0530	1130	73	97	1	E	3	W	0	0
15	5/31/2012	1B	JSw	0530	1130	77	98	1.8	SSW	2.4	E	0	0
15	5/31/2012	2B	SR	0530	1130	77	98	1.8	SSW	2.4	E	0	0
15	5/31/2012	3B	SMR	0545	1145	77	98	1.8	SSW	2.4	E	0	0
15	5/31/2012	4B	PH	0530	1130	77	98	1.8	SSW	2.4	E	0	0

BSE Rio Mesa Bird Migration Point Count

Behavior codes: FO=flyover S=soaring H=hunting/foraging P=perching V=vocalizing B=breeding (nest building, copulation, etc.)

Location:_____ Date:_____ Observer(s):_____ Start time: _____ End time: _____

Starting temp °F: ____ Starting wind speed (mph) & direction from: _____ Starting cloud cover (%): _____

Ending temp °F: ____ Ending wind speed (mph) & direction from: _____ Ending cloud cover (%): _____

Hour Period (i.e. 6-7)	Species Code	Obs. Meth. (A/V)	Distance from Point (m)	Direction from Point	Number	Flight Direction	Flight Height (m)	Behavior Code	Notes

APPENDIX C

Raptor Fixed-Point Observation Count Dates and Weather Conditions

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting Wind Direction	Ending Wind (mph)	Ending wind Direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)	Notes
1	3/6/2012	No Surveys, High Winds exceeding 25 MPH												survey ceased due to wind
1	3/7/2012	1R	JS	0800	1700	58	60	5-10	N	0-3	N	0	0	
1	3/7/2012	2R	BW	0900	1720	57	60	4-5	N	4-5	N	0	0	
1	3/7/2012	3R	ED	0845	1645	59.2	60.6	10.7	NW	3.4	N	0	0	
1	3/8/2012	1R	BW	0750	1550	63	71	4-5	N	4	NNE	0	0	
1	3/8/2012	2R	ED	0800	1600	61.5	75.8	8.3	N	4.5	S	0	0	
1	3/8/2012	3R	JS	0745	1545	61	76	0-3	N	0-3	S	0	0	
1	3/9/12	1R	ED	0700	1500	64.3	81.2	0	-	9.7	N	0	0	
1	3/9/12	2R	JS	0700	1500	90	78	0-5	N	5-10	S	0	0	
1	3/9/12	3R	BW	0752	1552	50	72	1-2	N	3-4	NNE	0	0	
2	3/16/2012	1R	BL	0730	1530	63	85	0-3	N	10-12	S	0	40	
2	3/16/2012	2R	BW	0735	1535	50s-60s	70s	1	N	4-5+	SW	0	60	
2	3/16/2012	3R	ED	0700	1500	57.7	88.9	0	-	9.8	S	0	60	
2	3/17/2012	1R	ED	0700	0930	65.7	65.9	8.9	W	20-25	W	100	95	surveys ceased due to wind
2	3/17/2012	2R	BW	0725	0925	50s	60s	5	SW	4-5	SW	90	90	surveys ceased due to wind
2	3/17/2012	3R	BL	0700	0930	56	63	10-15	W	15-25	W	85	90	surveys ceased due to wind
2	3/18/2012	1R	BW	0708	1219	40s	60s	3-4	SW	4-5+	SW	70	90	surveys ceased due to wind
2	3/18/2012	2R	ED	0700	1200	49.3	53.4	9.3	W	20.1		85	90	surveys ceased due to wind
2	3/18/2012	3R	BL	0700	1200	50	56	10-15	W	15-25	W	90	90	surveys ceased due to wind
2	3/19/2012	1R	BL	0630	1430	51	63	0-3	S	10-15	S	0	65	
2	3/19/2012	2R	BW	0630	1430	40s-50s	60s	2-3	SW	4	NW	5	<10	
2	3/19/2012	3R	ED	0630	1430	44.4	63.7	3.8	S	5.4	S	5	50	
3	3/23/2012	1R	BL	0700	1500	60	78	0-3	S	0-3	S	0	5	
3	3/23/2012	2R	BW	0645	1445	60s	75	1	N	1	N	0	10	
3	3/23/2012	3R	ED	0700	1500	62.1	81.1	2..7	S	3.1	S	0	20	
3	3/24/2012	1R	ED	0700	1500	61.4	94	.5	W	3.3	W	40	75	
3	3/24/2012	2R	BL	0700	1500	63	87	0-3	W	0-3	W	20	45	
3	3/24/2012	3R	BW	0645	1445	62	80	1	SW	4-5	S	25	95	
3	3/25/2012	1R	BW	0630	1430	62	82	1	WSW	4-5+	S	98	60	
3	3/25/2012	2R	ED	0700	1500	61.2	89.5	1.1	W	15	S	95	60	
3	3/25/2012	3R	BL	0700	1500	60	75	0-3	W	5-10	W	50	50	
3	3/26/2012	1R	BL	0700	1500	55	75	0-3	S	5-10	S	0	0	
3	3/26/2012	2R	BW	0633	1433	50	78	2-3	S-SE	3	NE	<5	0	
3	3/26/2012	3R	ED	0700	1500	55.5	76	2.9	S	4.1	S	10	0	
4	3/30/2012	1R	BW	0630	1430	55	87	1	NW	21-2	E	40	5	

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting Wind Direction	Ending Wind (mph)	Ending wind Direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)	Notes
4	3/30/2012	2R	ED	0645	1445	58.3	93.3	1.2-S	2.3	N	60	0	0	
4	3/30/2012	3R	BL	0700	1500	63	88	0-3	S	0-3	S	0	25	
4	3/31/2012	1R	BL	0700	1500	52	90	0-3	W	5-10	W	0	0	
4	3/31/2012	2R	BW	0625	1425	54	86	2	W	5+	SSW	0	0	
4	3/31/2012	3R	ED	0630	1430	67.1	89.6	2.9	S	12.4	S	5	0	
4	4/1/2012	1R	ED	0650	1215	61.1	72.7	6.5	W	15.9	W	5	0	surveys ceased due to wind
4	4/1/2012	2R	BL	0700	1230	58	64	5-15	W	15-25	W	0	0	surveys ceased due to wind
4	4/1/2012	3R	BW	0635	1210	55	68	4	W	>5	NW	2	-	surveys ceased due to wind
4	4/2/2012	1R	BW	0630	1122	58	78	3-4	N	5+	NNW	10	0	surveys ceased due to wind
4	4/2/2012	2R	ED	0630	1130	58.8	77.9	7.4	SW	15.8	W	20	0	surveys ceased due to wind
4	4/2/2012	3R	BL	0700	1100	60	79	10-15	W	15-25	W	0	0	surveys ceased due to wind
5	4/6/2012	1R	BW	0615	1418	50	77	4-5	N	4	NNW	5	15	
5	4/6/2012	2R	ED	0630	1045	56.6	65.9	13.1	NW	17.4	W	0	0	surveys ceased due to wind
5	4/6/2012	3R	BL	0700	0930	60	65	10-15	W	10-15	W	5	5	surveys ceased due to wind
5	4/7/2012	1R	BL	0700	1500	61	78	5-10	W	0-5	SW	10	15	
5	4/7/2012	2R	BW	0615	1415	58	80	1	SE	2-3	N	25	20	
5	4/7/2012	3R	ED	0630	1430	52.7	83	2.4	S	10.4	S	60	20	
5	4/8/2012	1R	ED	0615	1415	55.2	89.9	1.8	W	1.2	W	5	80	
5	4/8/2012	2R	BL	0700	1500	55	85	0-3	W	0-3	W	10	75	
5	4/8/2012	3R	BW	0610	1410	54	84	1	SSW	1-2	SE	5	75	
5	4/9/2012	1R	ED	0615	1415	60.5	97.7	1.8	S	3.7	S	65	10	
5	4/9/2012	2R	BL	0700	1300	60	92	0-3	W	0-3	W	0	0	
5	4/9/2012	3R	BW	0615	1415	53	90	1	N	3	SSW	30	20	
6	4/13/2012	1R	JS	0635	1435	60	75	0-3	S	15-20	S	60	80	
6	4/13/2012	2R	BL	0700	1500	62	78	0-3	SW	18-22	S	90	100	
6	4/13/2012	3R	BW	0610	1510	60	72	1	S	4-5	S	70	60	
6	4/14/2012	1R	JS	0600	0930	48	65	10-15	S	15-25	SW	10	45	surveys ceased due to wind
6	4/14/2012	2R	BW	0620	1020	50	67	3	SW	4-5	SW	5	30	surveys ceased due to wind
6	4/14/2012	3R	BL	0630	1000	57	66	5-15	N	20-25	W	5	30	surveys ceased due to wind
6	4/15/2012	1R	JS	0630	1430	50	73	0-5	NE	0-5	W	0	0	
6	4/15/2012	2R	BL	0700	1500	52	70	0-3	N	0-5	N	0	0	
6	4/15/2012	3R	BW	0610	1410	47	75	1	SW	2-3	SW	2	1	
6	4/16/2012	1R	BW	0620	1420	57	87	1	E	2	E	1	10	
6	4/16/2012	2R	JS	0635	1435	50	85	0-3	E	5-10	SE	0	0	
6	4/16/2012	3R	BL	0600	1400	62	83	0-5	SW	10-15	W	0	0	
7	4/20/2012	1R	JS	0600	1530	66	99	0	-	0-3	E	0	0	

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting Wind Direction	Ending Wind (mph)	Ending wind Direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)	Notes
7	4/20/2012	2R	BL	0600	1400	65	95	0-3	SE	0-3	SE	0	0	
7	4/20/2012	3R	BW	0630	1430	66	95	1-3	S	3-8	SE	0	0	
7	4/21/2012	1R	JS	0615	1415	66	95	0	-	0-3	N	0	0	
7	4/21/2012	2R	BW	0635	1430	63	92	0-3	N	5-10	NE	0	0	
7	4/21/2012	3R	BL	0600	1400	66	97	0	-	10-15	NE	0	0	
7	4/22/2012	1R	BW	0645	1430	77.5	94	1-3	E	3-6	E	5	25	
7	4/22/2012	2R	BL	0630	1430	72	100	0-3	NE	0-3	NE	0	0	
7	4/22/2012	3R	JS	0620	1420	70	97	0	-	0	-	0	0	
7	4/23/2012	1R	ED	0630	1430	72	91	0-8	S	5-7	N	0	20	
7	4/23/2012	2R	BW	0630	1430	70	95	0-5	NW	5-10	NW	0	0	
7	4/23/2012	3R	BL	0600	1400	70	100	0	-	5-10	NE	0	0	
8	4/27/2012	1R	BL	0630	1500	61	83	0-5	SE	5-8	S	0	10	
8	4/27/2012	2R	CM	0700	1500	65	89	3-8	S	0-3	S	0	5	
8	4/27/2012	3R	ED	0700	1500	63.5	85.8	.9	S	8.9	NE	0	5	
8	4/28/2012	1R	CM	0630	1430	71	95	0-3	SW	3-8	W	0	0	
8	4/28/2012	2R	ED	0630	1430	73.6	96.7	6.8	W	12.7	NW	0	0	
8	4/28/2012	3R	BL	0600	1400	72	96	0-5	W	5-10	S	0	0	
8	4/29/2012	1R	ED	0545	1345	66.5	99.8	.7	N	6.8	NE	0	10	
8	4/29/2012	2R	CM	0600	1400	68	94	0	-	0-5	SW	0	0	
8	4/29/2012	3R	BL	0600	1400	65	95	0-3	N	0-3	N	0	0	
8	4/30/2012	1R	CM	0600	1400	68	90	0-5	S	0	-	0	0	
8	4/30/2012	2R	MB	0615	1415	71	87	0-2	S	0-6	SW	0	0	
8	4/30/2012	3R	BL	0600	1400	68	85.5	5-10	SW	0-3	SW	0	0	

BSE Rio Mesa Raptor Point Count

Behavior codes: FO=flyover S=soaring HF=hunting/foraging P=perching V=vocalizing B=breeding (nest building, copulation, etc.)

Location: _____ Date: _____ Observer(s): _____ Start time: _____ End time: _____

Starting temp °F: ____ Starting wind speed (mph) & direction from: _____ Starting cloud cover (%): _____

Ending temp °F: ____ Ending wind speed (mph) & direction from: _____ Ending cloud cover (%): _____

Hour Period (i.e. 6-7)	Species Code	Obs. Meth. (A/V)	Distance from Point (m)	Direction from Point	Number	Flight Direction	Flight Height (m)	Behavior Code	Notes (Raptors: include duration of observation)

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
1	4/24/2012	E	CHM, PLH	0740	0950	78.5	81.4	0	-	4.6	NE	100	100
1	4/24/2012	J	PH	0700	0900	68	81	3	S	0	-	5	5
1	4/24/2012	K	IK	0700	0915	68	81	3	S	0	-	1	5
1	4/24/2012	L	SLK	0719	0934	68	81	3	S	0	-	0	0
1	4/24/2012	M	JSw	0725	0937	68	81	3	S	0	-	0	5
1	4/25/2012	B	IK	0850	1042	82.2	86.6	3.5	NE	3.3	E	100	100
1	4/25/2012	C	RO	0625	0831	82.2	86.6	3.5	NE	3.3	NE	100	100
1	4/25/2012	D	RO	0850	1040	85	88	0	-	3.3	E	100	100
1	4/25/2012	G	SLK	0658	0900	82.2	86.6	3.5	NE	3.3	NE	100	100
1	4/25/2012	H	JSw	0855	1044	82	86	3.5	NE	3.3	E	100	100
1	4/25/2012	I	IK	0630	0835	78.2	81.4	0	-	4.6	NE	100	100
1	4/25/2012	N	PH	0630	0820	78.2	81.4	0	-	4.6	NE	100	100
1	4/25/2012	O	PH	0830	1025	82.2	86.6	3.5	NE	3.3	E	100	100
1	4/25/2012	P	JSw	0650	0839	78	81	0	-	4.6	NE	100	100
1	4/30/2012	F	SLK	0712	0921	75	90	0	-	4	-	0	0
1	5/1/2012	A	HR	0603	0815	66.5	80.1	1.5	SW	2.2	SW	0	0
2	5/1/2012	C	SMR	0830	1030	77	88.5	6	S	3	S	40	35
2	5/1/2012	G	PH	0810	0955	77	88.5	6	S	3	S	40	35
2	5/1/2012	H	PH	0628	0804	71	77	0	-	4	S	20	20
2	5/1/2012	J	SMR	0610	0810	71	77	0	-	4	S	20	20
2	5/1/2012	K	SLK	0820	1013	77	88.5	6	S	3	S	10	10
2	5/1/2012	L	SLK	0606	0801	68	77	4	S	6	S	0	5
2	5/1/2012	O	JLL	0650	0907	72	82	1-3	S	5-10	S	0	0
2	5/2/2012	M	HR	0730	0946	75	79	10	S	12.5	S	30	20

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
2	5/3/2012	A	JAS	0629	0832	70	77	0	-	5	SW	5	8
2	5/3/2012	B	JAS	0908	1118	78	90	6	SW	2	SW	12	5
2	5/3/2012	D	MB	0628	0839	65	77	2	S	4	SE	5	5
2	5/3/2012	F	JS, CHM	0650	0857	72	85	0	-	3	-	10	10
2	5/3/2012	I	MB	0850	1054	78	85	7	SE	5	S	5	5
2	5/4/2012	P	PH	0545	0729	68	72	0	-	0	-	0	0
2	5/5/2012	E	CHM, ZOr	0623	0823	71	80	1	NW	7.5	W	15	15
2	5/5/2012	N	CHM, ZOr	0913	1111	88	89	1.9	NE	3	NW	10	5
3	5/8/2012	A	JSw	0634	0823	68	77	0	-	2	N	20	35
3	5/8/2012	B	IK	0843	1028	77	83	2	N	3	N	25	25
3	5/8/2012	D	IK	0628	0815	68	77	0	0	2	N	25	25
3	5/8/2012	E	JSw	0857	1045	77	83	2	N	3	N	20	10
3	5/8/2012	J	RR	0806	1005	75	89	2	N	5	NE	5	5
3	5/8/2012	K	RB	0839	1027	75	85	1.3	E	7.5	N	20	30
3	5/8/2012	L	RB	0610	0802	59	75	0	0	1.3	E	10	20
3	5/8/2012	N	RR	0607	0756	63.2	89	1	SW	5	NE	5	5
3	5/8/2012	O	PH	0734	0920	77	83	2	N	3	N	25	25
3	5/8/2012	P	PH	0550	0729	68	77	0	0	2	N	25	25
3	5/9/2012	C	JSw	0600	0817	85	90	2-4	NE	3-5	NE	5	0
3	5/9/2012	F	RR	0825	1012	85	90	2-4	NE	3-5	NE	0	0
3	5/9/2012	G	RR	0604	0759	65.8	80.2	2-4	SW	2-4	NE	0	0
3	5/9/2012	H	PH	0545	0731	66	78	0	-	0	-	20	10
3	5/9/2012	I	RB	0900	1041	82.6	89.6	0.4	E	2.7	N	0	1
3	5/9/2012	M	IK	0612	0806	85	90	2-4	NE	3-5	NE	0	0

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
4	5/16/2012	D	RR	0749	0945	83.8	96.1	4-6	N	2-4	N	0	0
4	5/16/2012	I	RR	0544	0740	78.7	83.8	2-4	NW	4-6	N	0	0
4	5/17/2012	A	RR	0807	0956	89.7	94.7	4-7	SE	8-14	SE	0	0
4	5/17/2012	C	IK	0753	0942	84	88.5	5	S	9	S	0	0
4	5/17/2012	E	RR	0608	0758	72.8	89.5	0	-	6-10	SE	0	0
4	5/17/2012	F	SLK	0607	0804	75	85	0	-	4	SE	0	0
4	5/17/2012	G	SLK	0815	1004	85	90	4	SE	8	S	0	0
4	5/17/2012	J	IK	0542	0736	76	84	2	S	1.5	S	0	0
4	5/17/2012	K	PH	0530	0714	76	84	2	S	1.5	S	0	0
4	5/17/2012	L	PH	0740	0921	84	88.5	5	S	9	S	0	0
4	5/17/2012	N	JSw	0557	0748	76	84	2	S	1.5	S	0	0
4	5/17/2012	O	JSw	0818	1009	-	-	-	-	-	-	0	-
4	5/18/2012	B	IK	0550	0744	75	83	3	S	4	S	0	0
4	5/18/2012	H	SLK	0619	0803	75	83	3	S	4	S	0	0
4	5/18/2012	M	RR	0543	0730	76.1	85.3	3-6	SE	0	-	0	0
4	5/18/2012	P	JSw	0604	0756	75	83	3	S	4	S	0	0
5	5/21/2012	A	IK	0602	0740	73	82	0	-	0	-	0	0
5	5/21/2012	C	SMR	0600	0800	73	82	0	-	0	-	0	0
5	5/21/2012	D	JSw	0801	0955	82.5	90.4	0	-	0	-	0	0
5	5/21/2012	E	IK	0825	1014	82.5	90.4	0	-	0	-	0	0
5	5/21/2012	F	SR	0838	1037	89	91	0	-	0	-	0	0
5	5/21/2012	G	SR	0603	0820	73	82	0	-	0	-	0	0
5	5/21/2012	H	PH	0740	0925	82.5	90.4	0	-	0	-	0	0
5	5/21/2012	I	JSw	0553	0754	73	82	0	-	0	-	0	0
5	5/21/2012	J	SMR	0820	1015	82.5	90.4	0	-	0	-	0	0

Week	Date	Location	Observer	Start Time	End Time	Starting Temp	Ending Temp	Starting Wind (mph)	Starting wind direction	Ending Wind (mph)	Ending wind direction	Starting Cloud Cover (%)	Ending Cloud Cover (%)
5	5/21/2012	K	RAB	0748	0929	80	85	0.5	E	1.0	E	0	0
5	5/21/2012	L	RAB	0552	0733	70	78	0.5	E	0.5	E	0	0
5	5/21/2012	N	SLK	0607	0808	73	80	0	-	0	-	0	0
5	5/21/2012	O	SLK	0817	1007	78	87	1	E	0	-	0	0
5	5/21/2012	P	PH	0545	0726	73	82	0	-	0	-	0	0
5	5/22/2012	B	PH	0545	0729	80	82.5	6-8	W	3-5	W	30	30
5	5/22/2012	M	SMR	0610	0805	80	80.5	6-8	W	3-5	W	30	30
6	5/25/2012	A	IK	0835	1020	76	80	8.9	SW	11	S	5	25
6	5/25/2012	B	SR	0610	0810	62.5	65	4	SE	7.5	SE	0	0
6	5/25/2012	C	SR	0830	1030	76	80	8.9	SW	11.	S	5	25
6	5/25/2012	D	JSw	0554	0743	72	76	1.3	E	6	S	15	0
6	5/25/2012	E	IK	0606	0753	72	76	1.3	E	6	S	2	0
6	5/25/2012	F	SR	0540	748	70	76	3.7	S	6	S	2	0
6	5/25/2012	G	SR	0804	1002	73	80	7.5	SSW	11	S	1	25
6	5/25/2012	I	JSw	0749	0946	76	80	8.9	SW	11	S	1	2
6	5/25/2012	J	SMR	0550	0805	72	76	1.3	E	6	S	2	0
6	5/25/2012	N	SLK	0804	0958	76	80	8.9	SW	11	S	5	25
6	5/25/2012	O	SLK	0606	0754	72	76	1.3	E	6	S	2	0
6	5/26/2012	H	SLK	0610	0758	62.5	69	4.4	SE	7.5	SE	0	0
6	5/26/2012	K	SR	0533	0726	58	62	7	SW	7.8	SW	0	0
6	5/26/2012	L	SR	0753	0945	63	71	13	SW	5.5	SW	0	0
6	5/26/2012	P	SLK	0816	1003	64.4	70	12	SE	9	S	0	0
6	5/27/2012	M	SLK	0557	0743	61.9	73	0	0	6	SW	0	0

BSE Rio Mesa Bird Migration Point Count Transect

Behavior codes: FO=flyover S=soaring H=Hunting/foraging P=perching V=vocalizing B=breeding (nest building, copulation, etc.)

Transect:_____ Date:_____ Observer(s):_____ Start time: _____ End time: _____

Starting temp °F: ____ Starting wind speed (mph) & direction from: _____ Starting cloud cover (%): _____

Ending temp °F: ____ Ending wind speed (mph) & direction from: _____ Ending cloud cover (%): _____

Point Number	Start Time	End Time	Species Code	Obs. Meth. (A/V)	Distance from Point (m)	Direction from Point	Number	Flight Direction	Flight Height (m)	Behavior Code	Notes

Spring Nocturnal Migration Studies for the Proposed Rio Mesa Solar Electric Generating Facility Riverside County, California

Interim Report

March 12 – May 31, 2012

Prepared for:

URS Corporation

4225 Executive Square, Suite 1600
LaJolla, California 92037

Prepared by:

Ken Levenstein, Zapata Courage, Donald Solick, Michelle Sonnenberg, and Chris Nations

Western EcoSystems Technology, Inc.
415 West 17th Street, Suite 200
Cheyenne, Wyoming 82001

September 25, 2012

WEST Inc.

NATURAL RESOURCES ◆ SCIENTIFIC SOLUTIONS

EXECUTIVE SUMMARY

The Rio Mesa Solar Electric Generating Facility (RMSEGF), would be located on the east side of the Mule Mountains approximately 13 miles southwest of Blythe, California (Figure 1). The site is within the Colorado Desert region of the Sonoran Desert on the Palo Verde Mesa in Riverside County, California. The main site is on private lands owned by the Metropolitan Water District (MWD). Portions of the gen-tie line, upgraded access road, and 33kV construction/emergency backup power supply line are located on public lands administered by the BLM.

URS contracted Western EcoSystems Technology, Inc to complete nocturnal migration radar surveys for birds and bats during the 2012 spring and fall migration periods. The following report describes the survey effort and results of the 2012 spring migration season (March 12-May 31) radar study. The goal of the nocturnal marine radar survey was to document migration over the project area and to measure migration parameters relevant to the project.

Nocturnal surveys were conducted with a mobile radar lab consisting of a mobile X-band marine radar unit mounted on a converted van. The X-band radar unit transmitted at 9,410 megahertz (MHz) with peak power output of 12 kilowatts (kW), and was similar to other radar labs used to study development sites throughout the United States. A single radar site was monitored during the spring period, and radar coverage of approximately 90 percent was achieved in both horizontal and vertical modes. The radar system used in this study has several controls which affect detection and tracking of targets. A “target” refers to a single radar echo. A target may represent more than one bird or bat if individuals are flying closely together. Targets with air speeds less than 6.0 meters/second (m/s; 19.7 feet/second [ft/s]; likely insects) or greater than 35.0 m/s (114.8 ft/s; aircraft) were considered not to be birds or bats and were excluded from further analysis of the data.

Results from the spring radar study conducted within the RMSEGF indicated that the mean spring flight direction was north-northwest at 349.5 degrees, which is consistent with migrants heading north along the Pacific Flyway. Mean passage rate for spring was 330.68 targets per km per hour [targets/km/hr] in horizontal mode; and 207.83 targets/km/hr in vertical mode. Mean flight height of targets was 382.0 meters ((m) 1,253 feet [ft])) above radar level (ARL) and approximately 34 percent of targets had flight altitudes less than or equal to the height of the proposed towers (229 m [751 ft]). Most (approximately 66 percent) of the nocturnal migrants recorded passing over the Radar Study Area (as defined below) were flying above the height of the proposed towers.

STUDY PARTICIPANTS

Western EcoSystems Technology

Ken Levenstein	Project Manager
Zapata Courage	Radar Coordinator
Donald Solick	Radar Coordinator
Kimberly Bay	Data Analyst and Report Manager
Michelle Sonennberg	Statistician
Jon Cicarelli	GIS Technician
Andrea Palochak	Technical Editor
Amy Raybuck	Field Technician
Brian Small	Field Technician

REPORT REFERENCE

K. Levenstein, Courage, Z., D. Solick, M. Sonnenberg, and C. Nations. 2012. Spring Nocturnal Migration Studies for the Proposed Rio Mesa Solar Electric Generating Facility, Riverside County, California: Interim Report: March 12 – May 31, 2012. Prepared for URS Corporation, LaJolla, California. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming.

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INTRODUCTION

The RMSEGF would be located in Riverside County, California, approximately 12 miles (19.3 kilometers [km]) south-west of Blythe and 2.5 miles (4.0 km) west of Palo Verde, California (Figure 1). The project will contain two solar thermal power plants each with a 750 foot (ft; 229 meter [m]) tall solar tower. Each plant will be capable of generating 250 megawatts (MW) of electricity, for a total capacity of 500 MW. The project will also contain a generator tie-line, connecting the two plants to the Southern California Edison Colorado River Substation, located north of the project area.

URS, the project's avian consultants, contracted Western EcoSystems Technology, Inc. (WEST) to complete nocturnal migration radar surveys for birds and bats during the spring and fall migration periodsThe following report describes the survey effort and preliminary results for the 2012 study for the radar surveys conducted during the spring season (March 12-May 31).

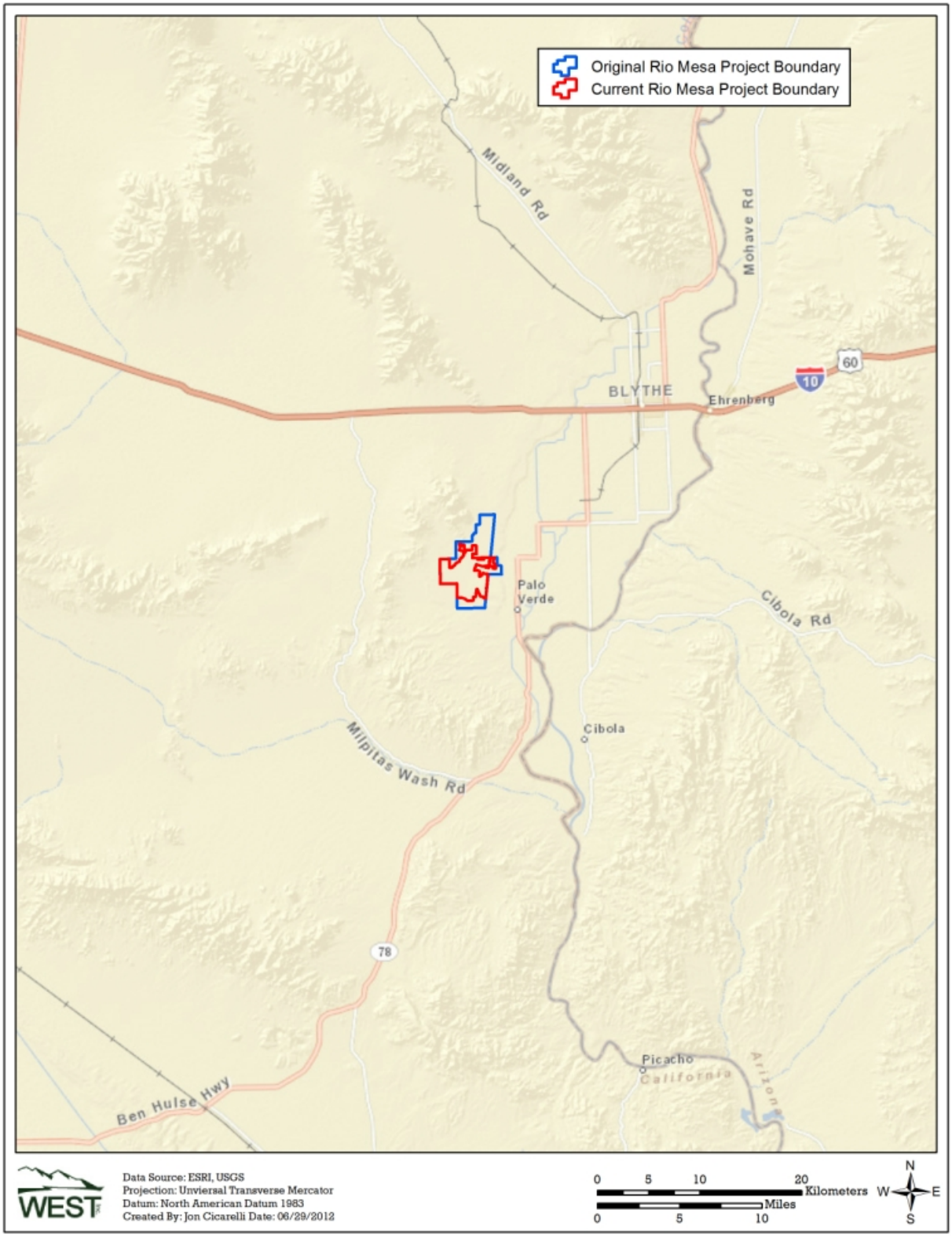

Figure 1. Location of the Rio Mesa Solar Electric Generating Facility, Riverside County, California.

PROJECT AREA DESCRIPTION

The RMSEGF is located near Blythe and Palo Verde, California, within five miles of the Arizona border and the Colorado River. The project area falls within the Sonoran Basin and Range Ecoregion (United States Environmental Protection Agency [USEPA] 2008). This ecoregion is characterized primarily by a hot desert landscape, with discontinuous mountain ranges separated by wide alluvial plains with an arid climate. The project area lies to the east side of Mule Mountains on the Palo Verde Mesa. Elevations within the project area range from approximately 79 m (259 ft) above mean sea level to 205 m (673 ft) above mean sea level.

The RMSEGF encompasses approximately 3,805 acres (5.9 square miles [mi^2]; Table 1 and Figure 2). According to the National Land Cover Dataset (NLCD), the dominant land cover type within the RMSEGF is shrub/sage-steppe at 3,426 acres (5.4 mi^2; 90.0 percent; United States Geological Survey [USGS] NLCD 2006), with an additional 379 acres (0.6 mi^2) of barren land (10.0 percent; Table 1, Figure 2).

Table 1. The land cover types, acreage, and composition within the Rio Mesa Solar Electric Generating Facility, California.

Habitat	Acres	% Composition
Barren	379.20	10.0
Shrub/Sage-Steppe	3,426.13	90.0
Total	**3805.33**	**100**

Data from the National Landcover Database (USGS NLCD 2006).

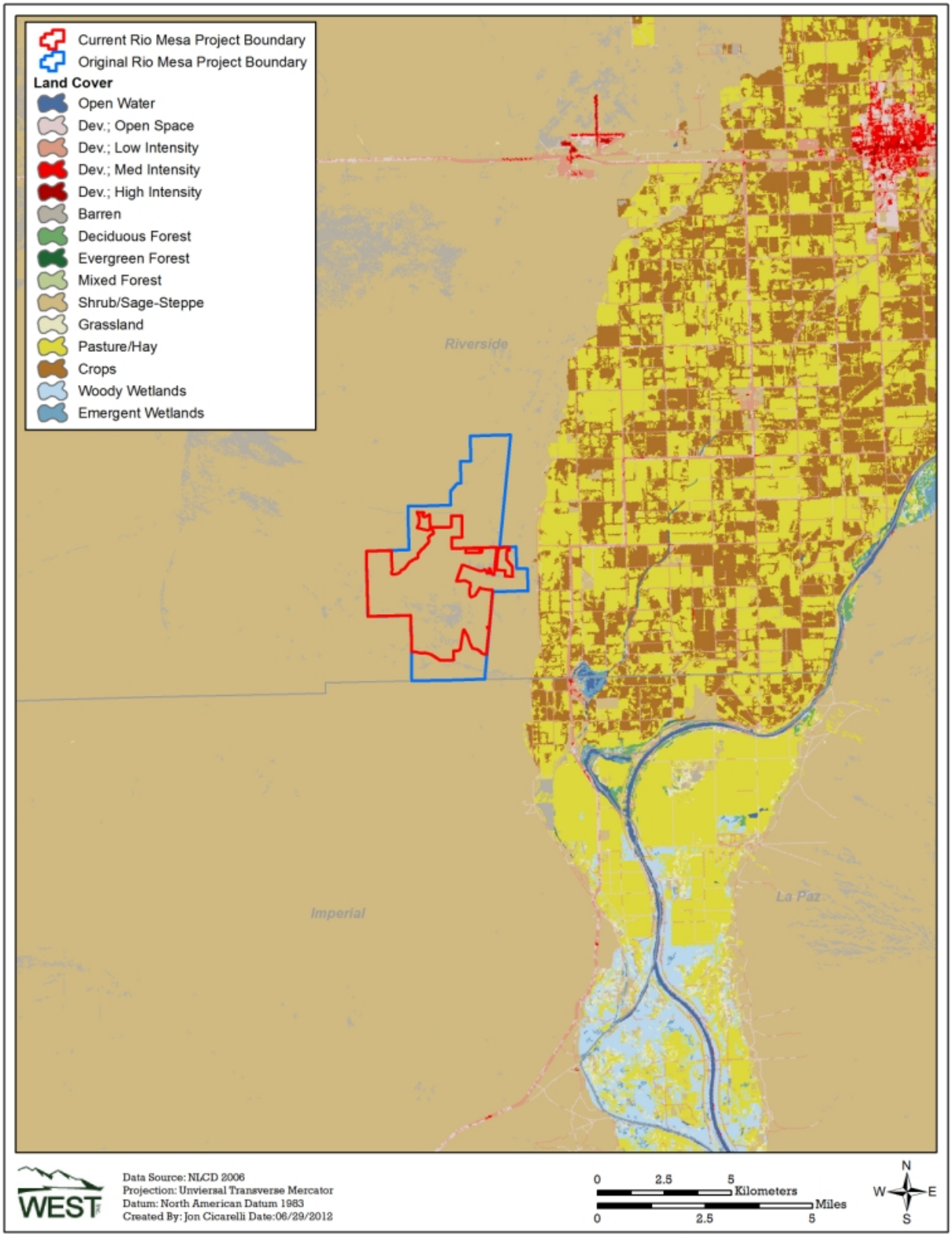

Figure 2. Land use and land cover classifications within the Rio Mesa Solar Electric Generating Facility.

METHODS

This report presents the preliminary results of the spring nocturnal radar study within RMSEGF. Spring surveys were completed at the RMSEGF from March 12 to May 31, 2012. This date range was chosen by URS to encompass the songbird and bat spring migration season in southern California.

Quality assurance and quality control (QA/QC) measures were implemented at all stages of the study, including in the field, during data entry and analysis, and report writing. A Microsoft® Access database was developed to store, organize and retrieve survey data. Data were keyed into the electronic database using a pre-defined format to facilitate subsequent QA/QC and data analysis. A daily site log was kept to document the number of surveys completed, weather or equipment failures resulting in missed sessions, and to provide comments on nightly observations. The database was inspected for completeness and accuracy by the technicians and the radar coordinator on a weekly basis. All electronic databases, site logs, and pictures were retained for reference.

Radar Unit and Sampling Location

A single mobile radar lab, consisting of a Furuno marine radar unit mounted on a van, was used to measure passage rates and collect related data. The X-band radar unit transmitted at 9,410 megahertz (MHz) with peak power output of 12 kilowatts (kW), and was similar to other radar labs used to study bird and bat passage rates at sites proposed for development of renewable energy projects throughout the United States (Cooper et al. 1991, Harmata et al. 1999, Roy and Pelletier 2005). This radar unit can be operated at a variety of ranges (e.g., 0.5 to 133 km [0.3 to 82.6 miles]) and pulse lengths (e.g., 0.07 to 1.0 microseconds [µsec]). For this study a range of 1.5 km (0.9 miles) and a pulse rate of 0.07 µsec were used as these settings are the most useful for tracking small targets such as migrating songbirds and bats. A “target” refers to a single radar echo. A target may represent more than one bird or bat if individuals are flying closely together. Targets with air speeds less than 6.0 m/second (m/s; 19.7 ft/second [ft/s]; likely insects) or greater than 35.0 m/s (114.8 ft/s; aircraft) were judged not to be birds or bats and were excluded from further analysis of the data. The type of radar used for this study (standard in the industry) cannot discriminate between birds and bats; however, migrating birds typically comprise the vast majority of targets detected in this type of study and this report will primarily be geared towards addressing avian migrant passage as it relates to the project. The area measured by the radar system (7.07 km^2 [2.73 mi^2]) comprises the “Radar Study Area” for the survey (RSA; Figure 3).

The RSA was situated in a desert landscape sparsely populated with xeric scrub vegetation. In horizontal surveillance mode, approximately 25 percent of the screen was obscured by ground clutter, due to reflectivity from the desert floor, primarily in the northwest and northeast quadrants (Appendix A); however, targets could be seen moving into and out of these areas and data collection on many targets utilizing this airspace was achieved. In vertical mode, reflected energy obscured approximately 5 percent of the screen, mainly within the immediate vicinity of the antenna and along the ground between 25-40 m (82-131 ft; Appendix A) from the radar lab.

Altitude of targets was measured to as low as 30 m (98 ft) above radar level (ARL) during the study.

The placement of the mobile radar lab was determined based on constraints of the radar system (e.g., minimization of ground interference), safety, and access, and with the goal of providing the best possible coverage of the surrounding area (Figure 3). The radar lab location was established on a dirt road adjacent to the south-eastern boundary of the project area (Appendix A). This site provided a large area of coverage in which targets could be acquired as they approached and entered the project from the south and southeast. Further, as the Lower Colorado River acts as a funnel for northward migrating birds as well as a stopover where migrating birds can feed and rest during the day, WEST determined the placement of the radar system in the southeastern segment of the project could prove effective at assessing passage of birds entering the project from the river area. The radar data obtained from the RSA provides an adequate sampling of bird and bat passage at the RMSEGF.

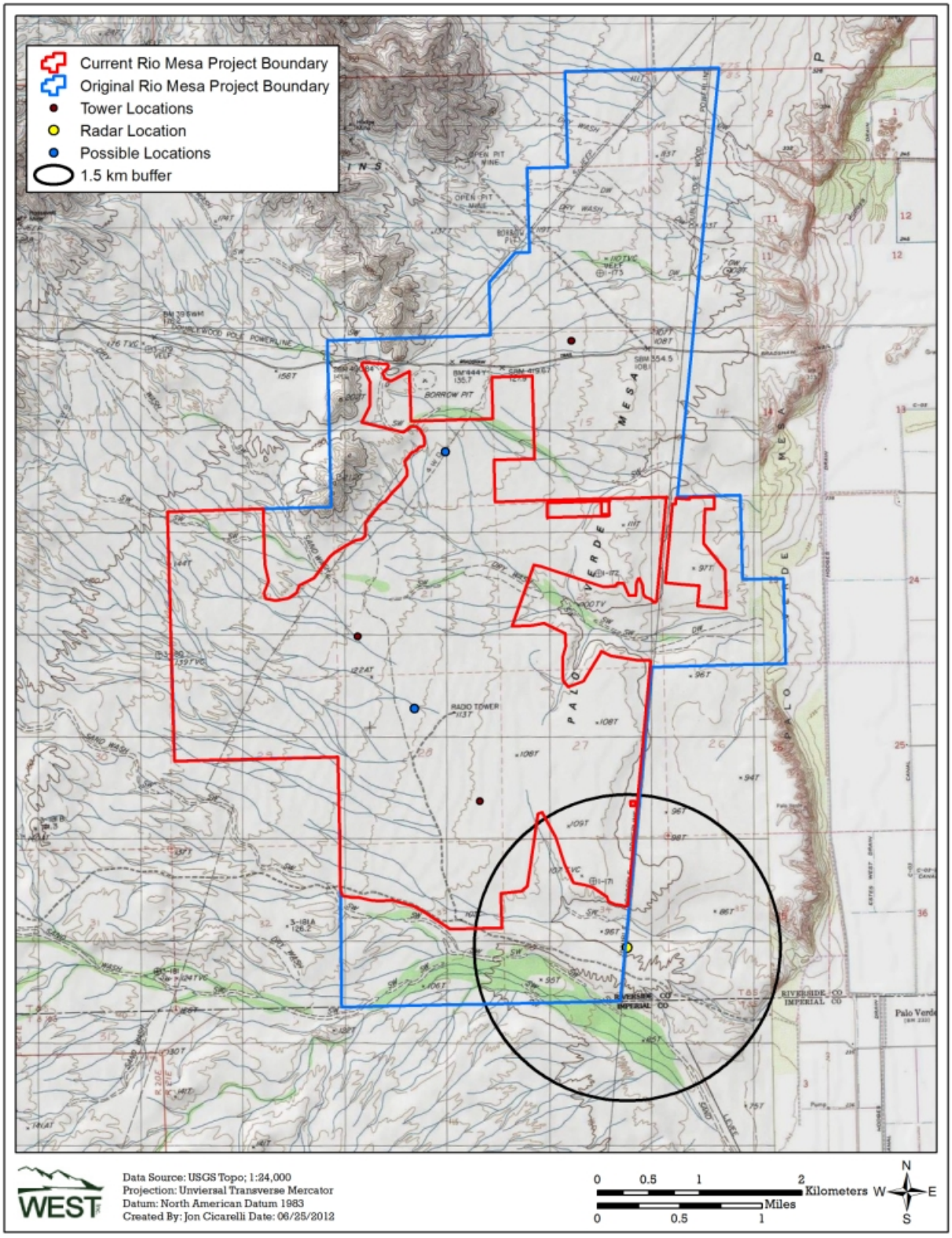

Figure 3. Location and sampling radius of the Radar Study Area at the Rio Mesa Solar Electric Generating Facility.

Ground Clutter Reduction, Radar Settings, and Data Collection

Ground Clutter Reduction

The radar unit was aligned with magnetic north by parking the van in the same spot and orientation each survey night. To decrease ground clutter, the radar was positioned near low-lying hills that acted as a radar fence or screen, reflecting back the lower portion of the radar main beam and producing a clear picture of sky beyond. In addition, while operating in vertical mode, a blind sector was set so that the radar did not transmit energy when the antenna was pointing towards the ground (from 90 to 270 degrees [^{o}]). This procedure reduced ground clutter around the radar unit that would be generated from secondary echoes of radar energy bouncing off the van and ground.

Radar Settings

The Furuno radar unit used in this study has several controls which affect detection and tracking of targets. In order to detect and track small targets, the radar unit operated under the shortest pulse length setting, with the gain control turned up to maximize target detection and minimize noise on the screen. Initially, the anti-clutter controls on the radar were turned down to the lowest setting. The anti-sea clutter and anti-rain clutter controls were kept at their lowest settings so as to not remove smaller targets from the display. On nights when insect density prevented viewing of bird/bat targets, the anti-sea clutter control was used sparingly to reduce detection of insect targets in the vicinity of the radar.

Data Collection

Horizontal Mode: Passage Rate and Flight Direction and Speed

The radar trails function, an on-screen plotting of a sequence of echoes used in horizontal mode, was set at 30 seconds so targets could be tracked long enough to define objects as targets of interest, and to determine their direction and speed. Passage rates were determined, in horizontal mode, by recording all targets that appeared on the monitor with a minimum of three target trail echoes. Each target was recorded individually on a hand-held tally counter (Appendix A).

Target flight direction was determined by placing the cursor on a target echo within a trail and aligning the offset electronic bearing line along the line of target echoes pointing in the direction of travel. A compass bearing from zero to 360^{o} was displayed and entered into the database (Appendix A).

Target speed was recorded as the distance a target traveled in five seconds (two sweeps of the radar antenna). With the target trails function activated, each sweep of the radar plotted a new echo for any given target, with each echo persisting on the screen for 30 seconds. Speed was determined using the offset variable range marker. The cursor was placed on a target echo and the distance between that echo and the third echo in line (i.e., the distance traveled in two sweeps of the antenna or five seconds) was measured (Appendix A).

Vertical Mode: Passage Rate and Flight Height

Vertical passage rate was determined by recording, on the hand-held tally counter, all targets that appeared on the radar monitor, regardless of whether the target was or was not followed by a target trail (as described above; Appendix A). When operating in vertical mode, the antenna was creating a two dimensional plane through which a target may have approached the radar beam either perpendicularly or in parallel. If a target passed perpendicular to the beam, the target appeared as a solid entity, shielding any evidence of target trails behind it, and appeared as if it were not moving. Hence all solid entities observed on the screen were assumed to be targets and counted.

Target height, obtained in vertical mode, was measured with an index line (a tangent on the variable range marker) on the monitor relative to a horizontal line running through the point of origin for the radar. Altitude, in kilometers, was displayed on the radar monitor and entered in the database as meters (Appendix A). The passage rates determined by the radar system while deployed in vertical mode should be interpreted primarily as a gauge by which to assess the sample size for measuring the heights of targets, the primary purpose of the radar in vertical mode.

Horizontal versus Vertical Modes

The primary difference between radar used in the horizontal mode and radar used in the vertical mode is the area covered by the radar. In horizontal mode, the radar is monitoring targets within an airspace that is approximately 3 km in diameter and 500 m high. In vertical mode, the radar is monitoring targets up to 1.5 km above, and approximately 500 m to each side of, the radar unit. Therefore, in horizontal mode, the radar is detecting targets in a greater area and the operator is able to assess whether the targets are birds, bats or insects based on the size and speed of targets detected and the direction in which the targets are heading. In vertical mode, the targets are passing through a vertically oriented plane (i.e., one that is perpendicular to the ground) and the radar operator counts all targets passing through the plane. When operated in the vertical mode, the radar system allows for the measurement of target heights and detects targets passing at heights that are greater than are detectable when the radar is operated in horizontal mode.

Radar Sampling Protocol

Sampling occurred from approximately sunset until sunrise each night, unless interrupted by inclement weather, dust clouds, relatively high levels of insect contamination, or unforeseen circumstances (e.g., power or equipment failure). All sampling was conducted with the radar set at 1.5 km range. Each night was divided into 1-hour sampling periods, with each hour consisting of several sessions for measuring different target characteristics. These sessions are detailed below in the order of sessions completed within the hour:

1) One 10-minute session per hour (hr) to collect weather data using a Kestrel Weather Meter 3500 and technician observation. Data collected included: wind speed and direction, percent cloud cover, approximate ceiling height and visibility, precipitation, barometric pressure, and air temperature. For analysis, weather data collected at an on-site meteorological (met) tower was used.
2) One 10-minute data collection session/hr in horizontal mode to collect data of migration passage rates;
3) One 10-minute data collection session/hr in horizontal mode to collect data of flight direction and speed;
4) One 10-minute break/hr to adjust radar antenna orientation from horizontal to vertical;
5) One 10-minute data collection session/hr in vertical mode to collect data of migration passage rates; and
6) One 10-minute data collection session/hr in vertical mode to collect data of flight altitudes (ARL) below 1,500 m (4,921 ft).

Radar Statistical Analysis

All data were exported from Microsoft® Access and imported into the Program R™ package (R Development Core Team 2010) for further processing, quality assurance, and analysis. To determine passage rates in horizontal mode, the 2-dimensional area represented by the radar image was treated as a 1-dimensional "front" perpendicular to the presumed direction of migration, with length equal to 3.00 km (1.86 miles; the diameter of the RSA); all targets counted in the radar image during the sampling period were treated as if they had crossed the front. Based on that assumption, passage rate was calculated as number of targets per km per hour (targets/km/hr).

Air speed of targets, V_a, was calculated as $\mathrm{V_a} = \left[\mathrm{V_g^2} + \mathrm{V_w^2}\text{-}2\mathrm{V_g V_w}\cos(\Delta\theta)\right]$, where V_g = target ground speed, V_w = wind speed, and $\Delta\theta$ was the difference between the target flight direction and wind direction. Targets with air speeds less than 6.0 m/s (19.7 ft/s) or greater than 35.0 m/s (114.8 ft/s) were judged not to be migrating birds and were excluded from further analysis of the data from the speed and direction sessions. The lower limit (6.0 m/s) has been used in other studies (e.g., Diehl et al. 2003) to exclude insects and small targets moving passively with the wind. The upper limit (35 m/s) was used to exclude small aircraft. Weather observations collected at an on-site met tower were used to determine wind speed and direction. Anemometers, at approximately 10 m (32.8 ft) above ground level were used for estimates of wind speed and direction. Wind speed at bird flight heights was estimated by adjusting speed measured at the met tower to account for losses due to wind shear. In particular, the power law relationship (Elliot et al. 1986) was used to calculate wind speed at bird height as $V_w = V_0(h/h_0)^{\alpha}$ where h_0 was the measurement height, V_0 was the measured speed, h was bird height, and α was the exponent that depends on several factors, including ground surface roughness and solar insulation. For simplicity, bird height (h) was assumed to be 229 m (751 ft; approximate height of solar towers) ARL and α was assumed to be 0.2.

Mean flight direction was estimated as $\mu = \tan^{-1}(\bar{y}/\bar{x})$ where $\bar{y} = \sum_{i=1}^{n} \cos(\theta_i)/n$, $\bar{x} = \sum_{i=1}^{n} \sin(\theta_i)/n$, and θ_i was the flight direction for the i^{th} observation (Batschelet 1981). Dispersion in the data was calculated as $r = (\bar{x}^2 + \bar{y}^2)^{1/2}$, such that $0 \leq r \leq 1$. If all observations had exactly the same direction, $r = 1$; conversely, $r = 0$ would indicate uniform distribution of directions around the circle. A confidence interval for the mean direction was estimated using a bootstrap procedure (Manly 2007). Observed directions were sampled with replacement 5,000 times. The mean of each re-sampled dataset was calculated as above, and the 95 percent confidence interval was obtained using the percentile method (i.e., the confidence limits were calculated as the values enclosing the central 95 percent of the bootstrap distribution of means).

In general, marine radar cannot be used reliably to identify target species (Harmata et al. 1999, Weber et al. 2005), though insects are often distinguishable from birds and bats as insects are smaller and generally move more slowly (Schmaljohann et al. 2008). Radar sessions were excluded from analysis if insect numbers were relatively very high. Nonetheless, the data in other sessions may have been contaminated by such targets. To adjust for this contamination in the analysis, the proportion of targets with acceptable speed (between 6.0 and 35 m/s) was calculated for each night of the study. These values were used to adjust passage rates in both horizontal and vertical mode operation, so that the adjusted number of targets during each passage rate session was calculated as:

Adjusted count = Actual count × Proportion of targets with acceptable speed

The adjusted count was used in subsequent estimations of passage rates. Such adjustment assumed that the proportion of slow-moving targets was constant throughout each evening and that slow-moving targets were uniformly distributed with respect to altitude. Both assumptions are untested. Insects may be more active at certain times of the evening, and may exhibit altitudinal gradients that differ from the altitude distribution of birds. Because of possible, but unknown, altitude gradients, data collected during sessions for flight altitude were not adjusted in any way. Analyses were also not corrected for unequal detection probability as a function of distance from the radar unit.

RESULTS

Nocturnal Radar Study

Nocturnal radar surveys were conducted on 60 nights during the 81-night spring season study, or from March 12 through May 31, 2012. Radar sampling was conducted for approximately 600 hours. Some hourly sessions were incomplete or had to be skipped due to inclement weather, dust storms, or comparatively heavy insect densities; however, the number of successfully completed sessions was more than adequate for the study analyses (Table 2).

Passage Rates

Horizontal and Vertical Passage Rates

The adjusted mean passage rate in the horizontal mode was (mean ± the standard error [SE]) 330.68 ± 10.1 targets/km/hr (n = 623 sample periods). For radar in the vertical mode, the passage rate was 207.83 ± 5.7 targets/km/hr (n = 592 sample periods). Nightly passage rates were generally highly variable in both horizontal and vertical modes (Figures 4 and 5, respectively), but passage rates increased during the study period. Passage rates for both horizontal and vertical modes were highest on May 17, and were lowest on April 11.

Mean hourly passage rates in horizontal mode (Figure 6) were lowest during the first two hours and last two hours of the night. Horizontal passage rates tended to be relatively consistent between 20:00 and 04:00 hours. Mean hourly passage rates in vertical mode (Figure 7) were largely consistent throughout most of the night, with slight peaks in activity at 20:00 and 0:00 hours, and a decrease in passage rates generally occurred during the last hour of the night.

Table 2. Number of radar surveys missed at the Rio Mesa Solar Electric Generating Facility Radar Study Area by reason and survey totals.

	Horizontal counts	Vertical counts	Speed and direction	Altitude
Dense Targets/Insects	26	24	24	25
Sunrise	10	37	22	47
Rain or Dust	6	8	6	8
Other	1	5	4	3
Number of missed sessions	43	74	56	83
Number of session attempts	667	667	611	594
Number of successful sessions	624	593	555	511

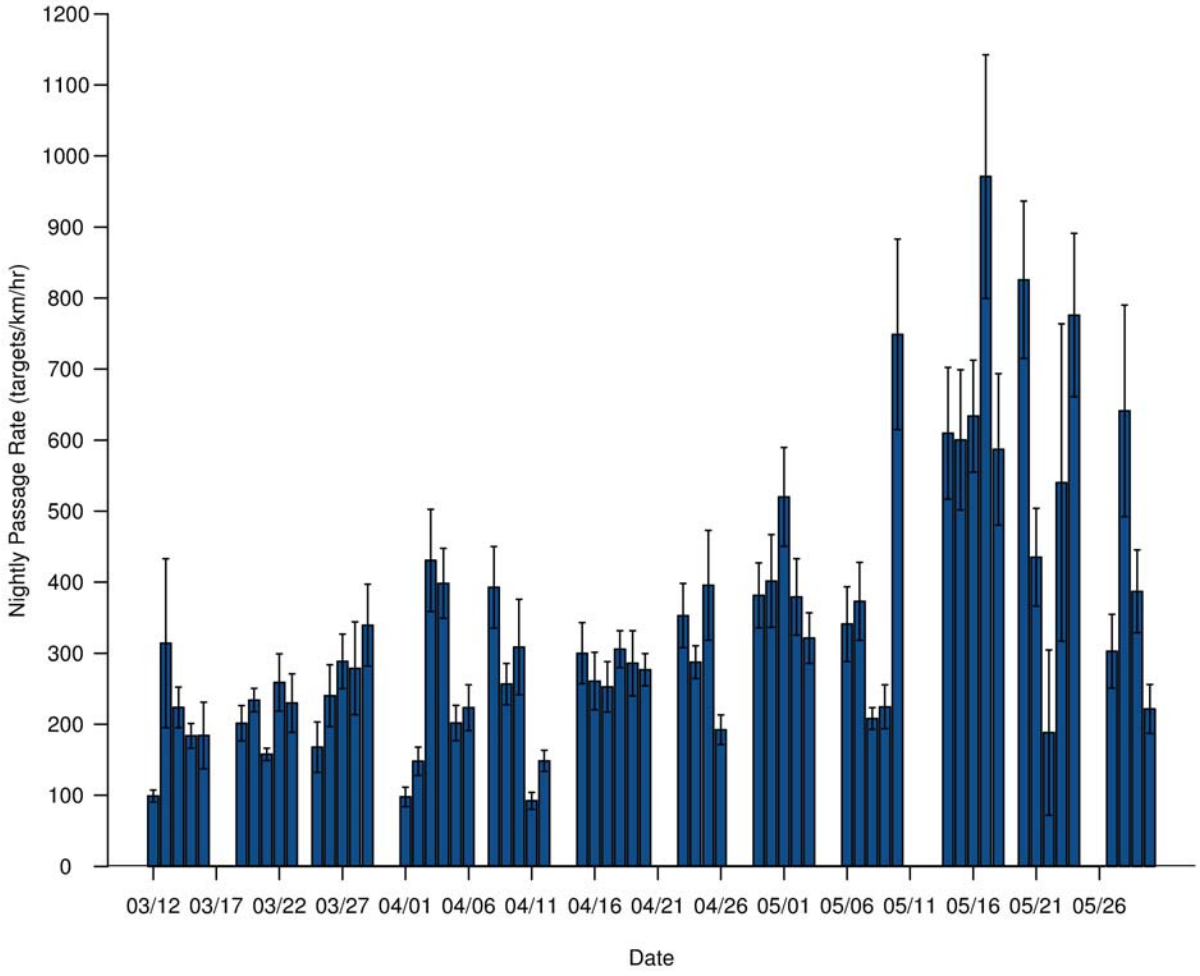

Figure 4. Mean ± 1 SE nightly passage rates recorded during radar surveys operating in horizontal mode at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012

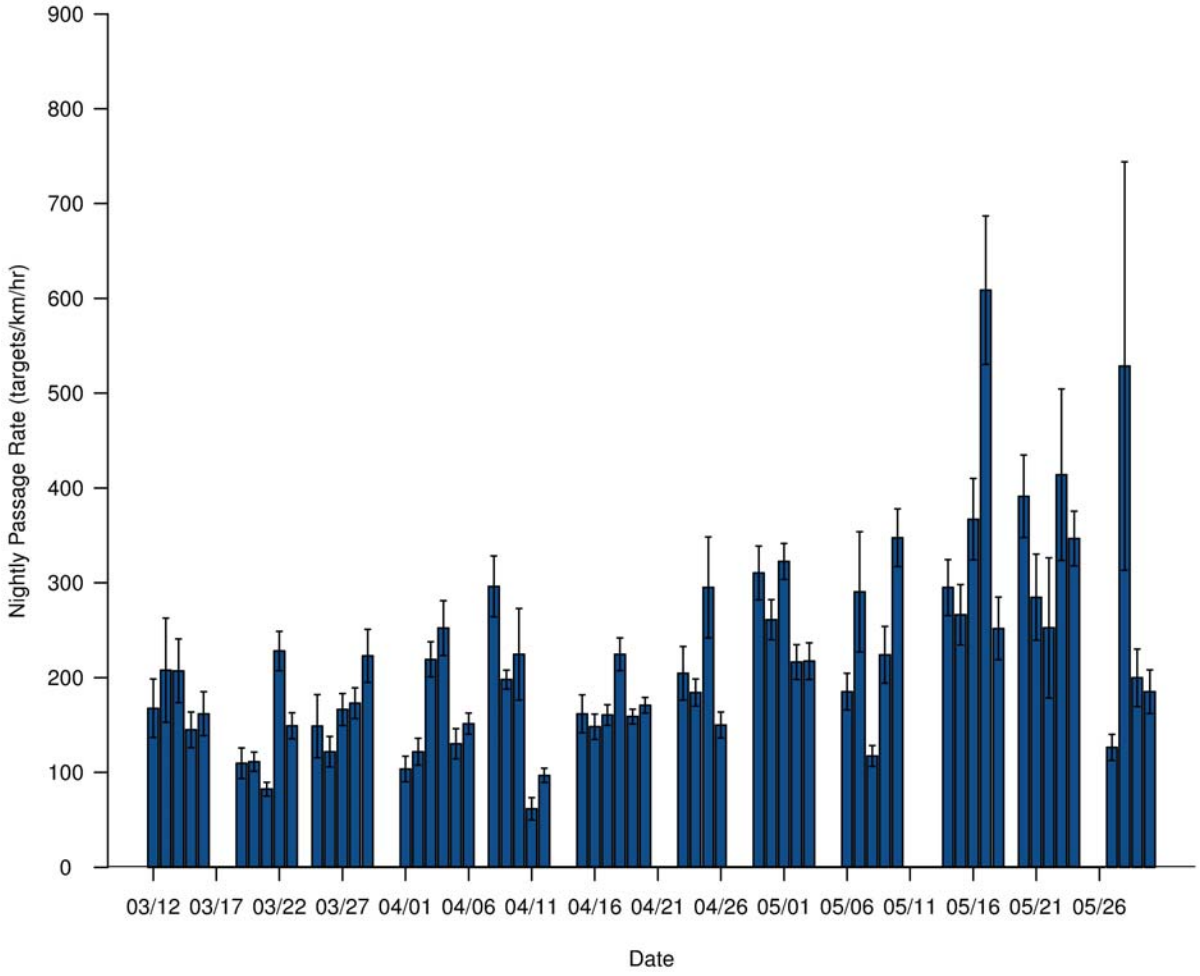

Figure 5. Mean ± 1 SE nightly passage rates recorded during radar surveys operating in vertical mode at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012.

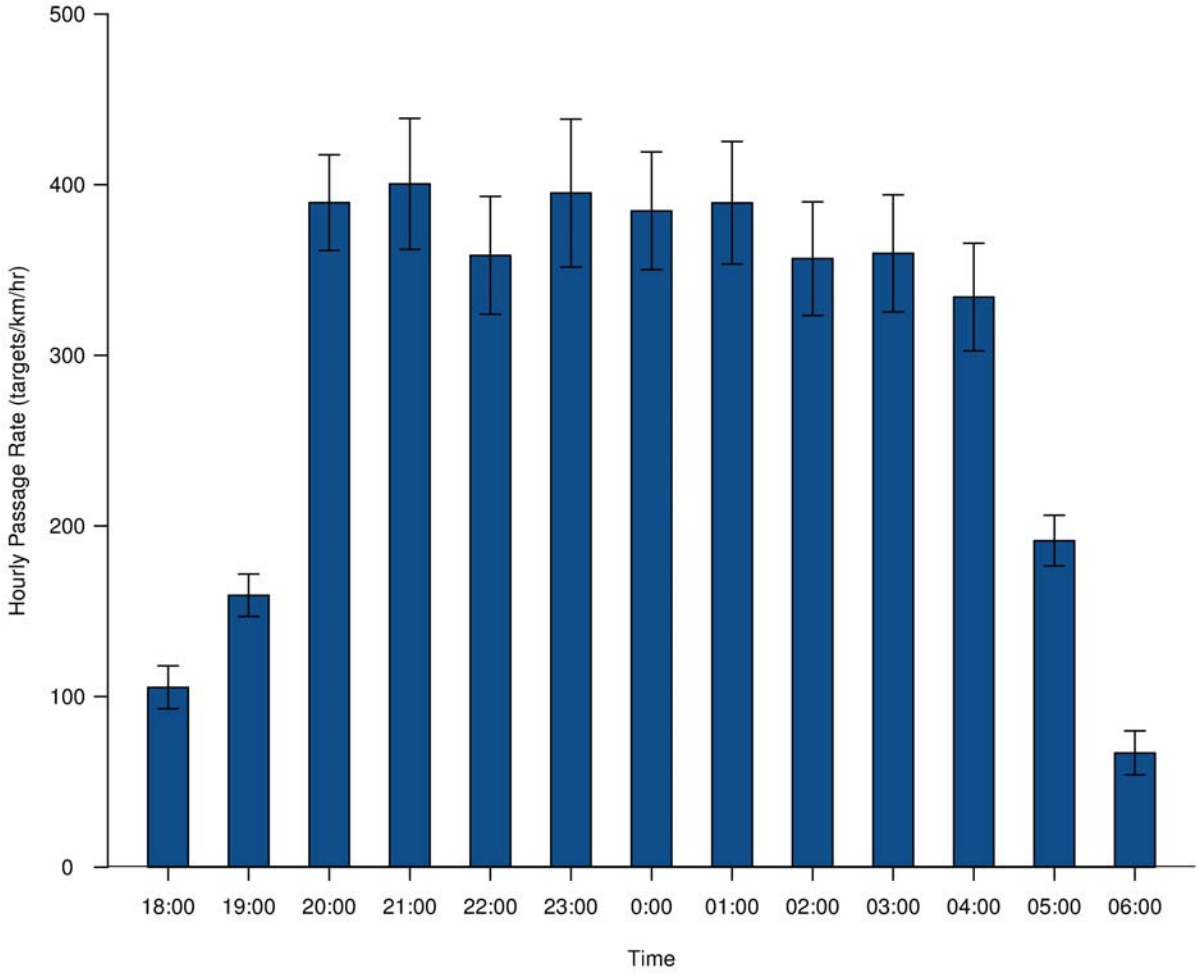

Figure 6. Mean ± 1 SE hourly passage rates recorded during radar surveys operating in horizontal mode at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012.

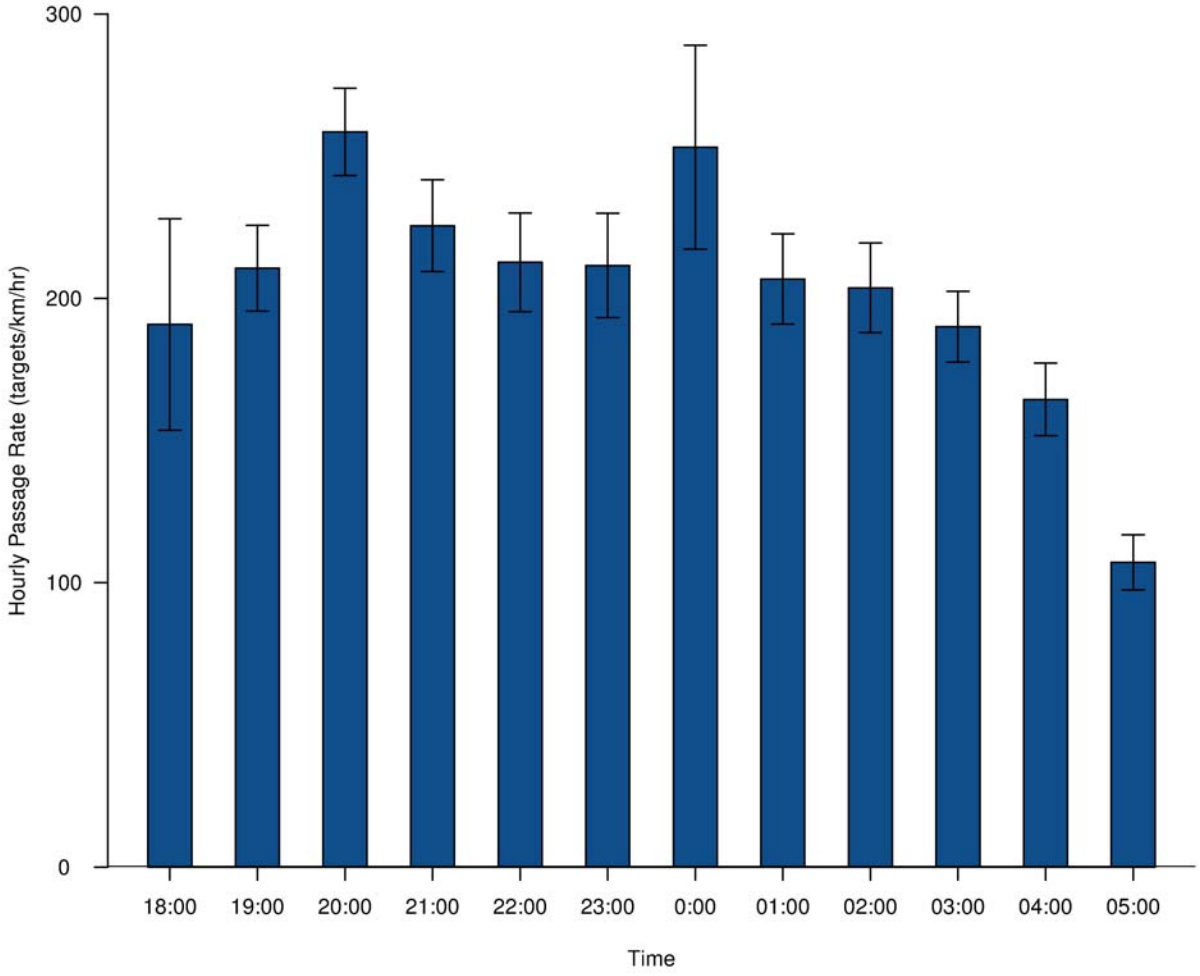

Figure 7. Mean ± 1 SE hourly passage rates recorded during radar surveys operating in vertical mode at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012.

Target Speed

The average wind speed measured at 229 m (750 ft) AGL during the study period was 8.5 m/s (27.7 ft/s). Wind speeds at this height ranged from 0.8 m/s to 19.5 m/s (2.7 ft/s to 63.8 ft/s). Of 18,867 targets with measured airspeed, 4,655 of targets (24.7 percent) were excluded because their speeds were very low (i.e., less than 6.0 m/s), while no targets (0 percent) were excluded due to relatively high speed (i.e., more than 35.0 m/s). Of the 60 nights during which target speeds were measured, 29 nights had about 75 percent or more targets with acceptable airspeeds, indicating that insect contamination or other windblown debris could have been a factor on about half the nights (Figure 8). Notably, the nights of March 12 and May 22 had much lower percentages of acceptable airspeeds (36.3 percent and 33.6 percent, respectively). After excluding very slow targets, overall mean target air speed was 11.3 ± 0.03 m/s (mean ± SE; 38.0 ± 0.01 ft/s; *n* = 14,212 targets). Nightly mean target air speed varied from approximately 8.2 to 18.1 m/s (27.0 to 59.5 ft/s; Figure 9).

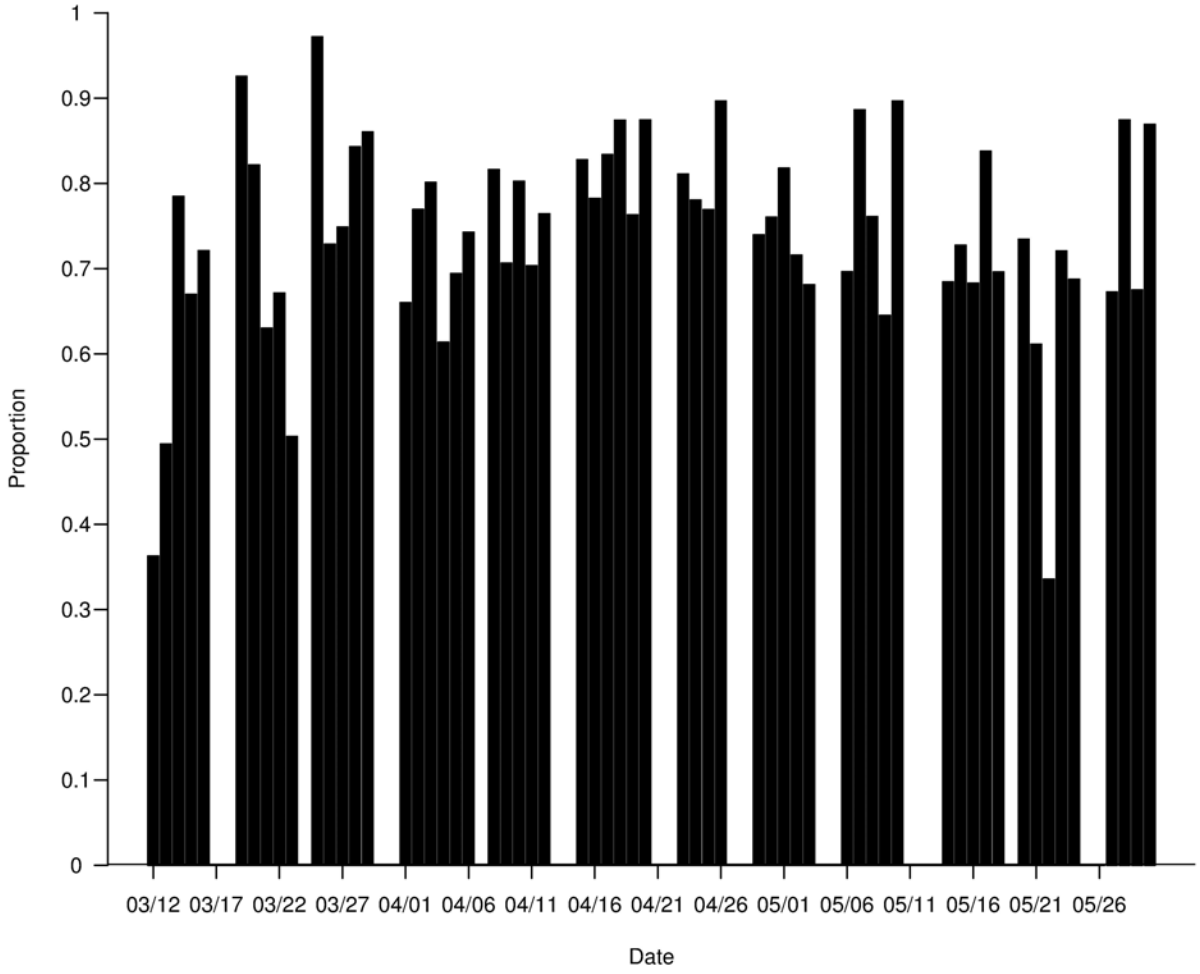

Figure 8. Nightly proportion of targets with acceptable air speed recorded during radar surveys within the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012.

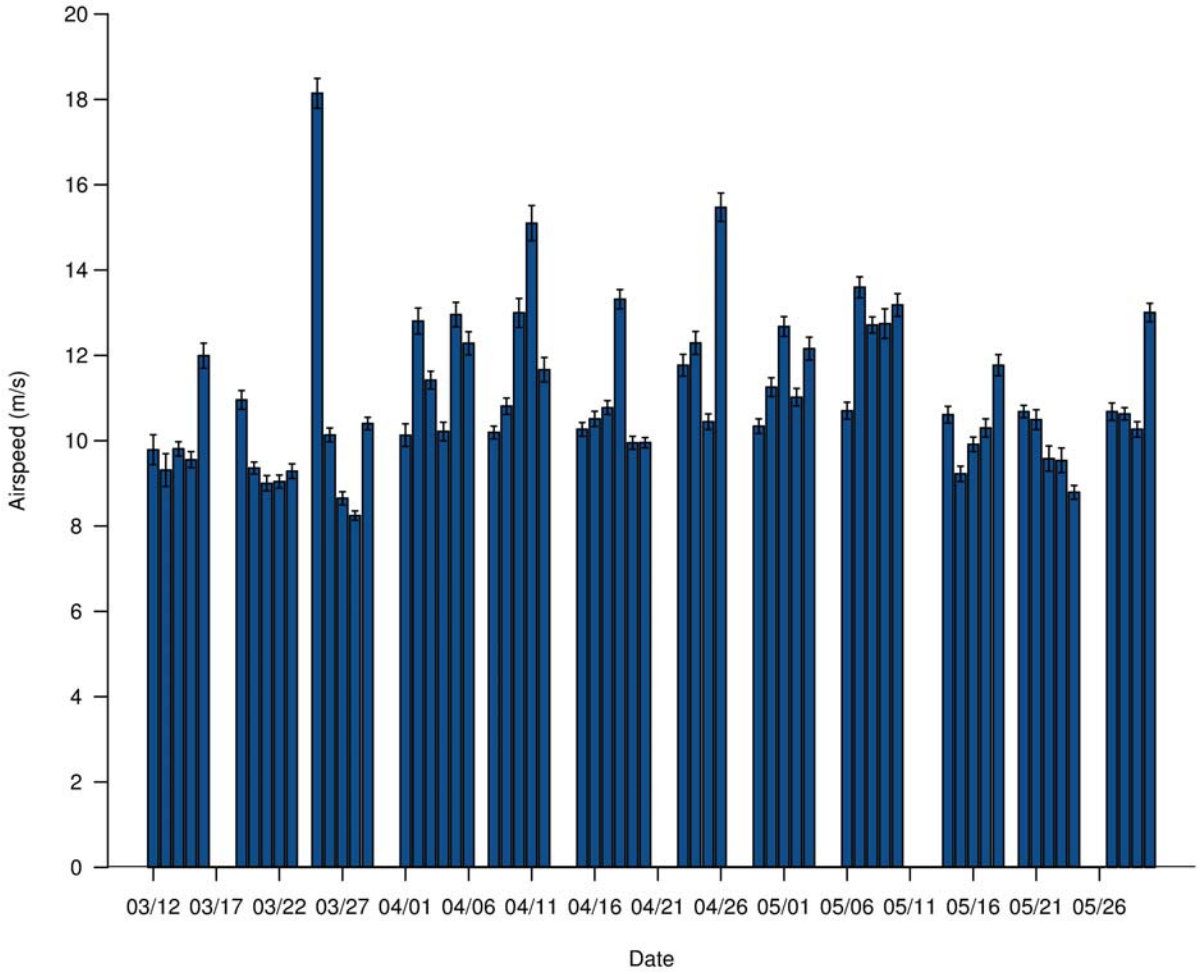

Figure 9. Mean ± 1 SE nightly target air speed recorded during radar surveys within the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012.

Flight Direction

Targets were generally flying toward the north-northwest (Figure 10). Mean direction was 349.5º (*n* = 14,212 targets), with a 95 percent confidence interval of 347.66 - 350.92º. Dispersion was *r* = 0.41, indicating moderate concentration of directions around the mean. Approximately 44 percent of targets had flight directions within 45º of the mean direction (i.e., between 304.5º and 34.5º).

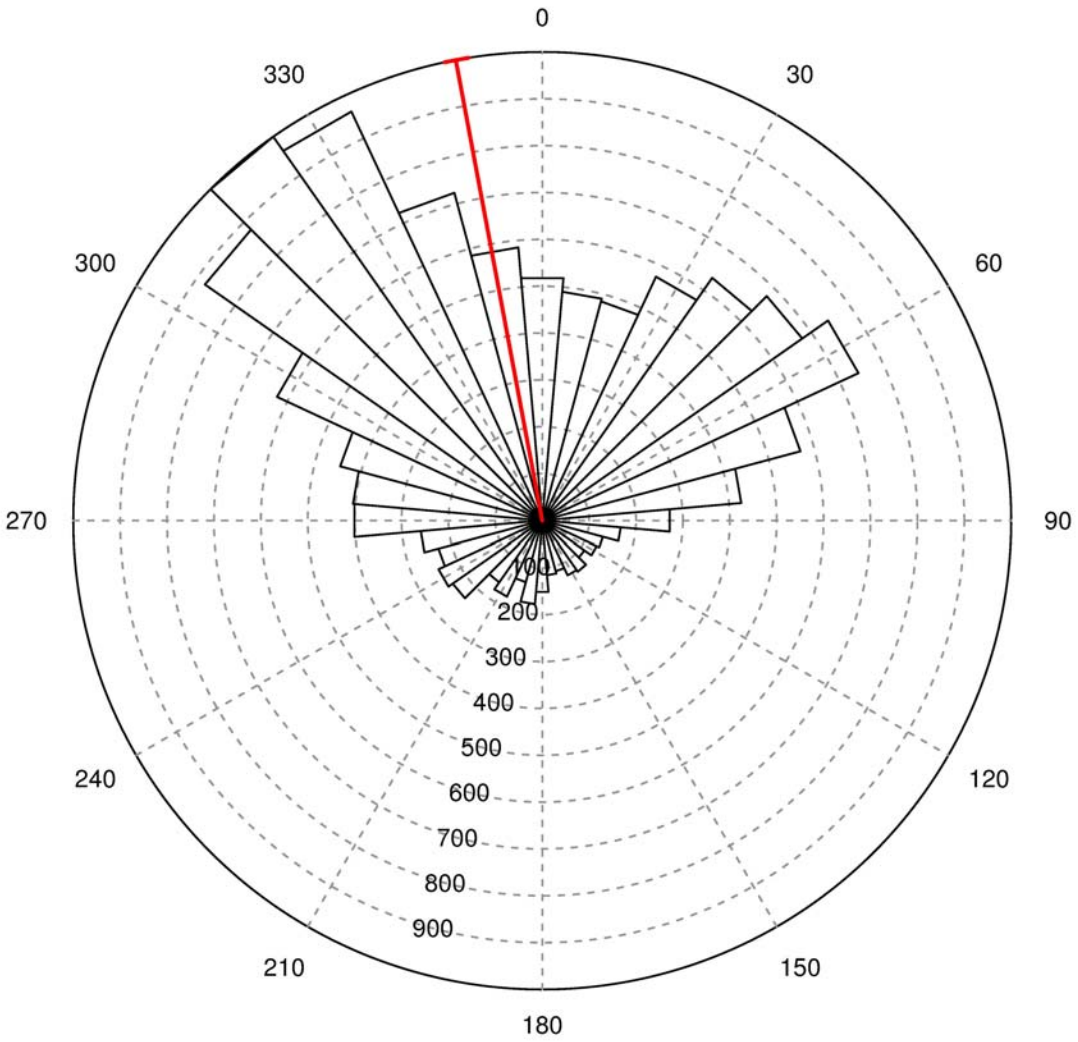

Figure 10. Observed flight directions, with mean direction shown by red line and 95% confidence interval (short perpendicular red bar at end of mean line) of targets observed during radar surveys at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012

Flight Altitudes

Mean flight altitude was 382.0 ± 1.2 m (1,253.3 ± 3.9 ft [*n* = 51,690 targets]) above radar level (ARL)[1]. Approximately 33.9 percent of targets had flight altitudes less than or equal to 229 m (750 ft) at the study site (the height of the proposed towers). Among the height classes, the highest percentage of targets occurred between 152.4 and 228.6 m ARL (500 and 750 ft; Figure 11). Nightly mean flight altitudes were variable throughout the period, ranging from approximately 303 to 487 m (994 to 1,598 ft) ARL (Figure 12). Overall, mean altitudes showed no clear trends during the study period. Boxplots showing the distribution of nightly flight altitude

[1] Target altitude was measured in relation to a horizontal line running through the point of origin for the radar and thus termed ARL. Height AGL is highly variable, depending on the topography directly below any given target and is not measurable with the radar.

in relationship to height of the proposed solar towers illustrate that on all nights of the study, at least 50 percent targets were flying above tower heights (because the centerline of the box, representing the median, is above 229 m (the shaded area; Figure 13). Hourly mean flight altitudes were generally between 375 and 425 m (1,230 – 1,394 ft) ARL, though somewhat lower in the last hour of the surveys (05:00; Figure 14).

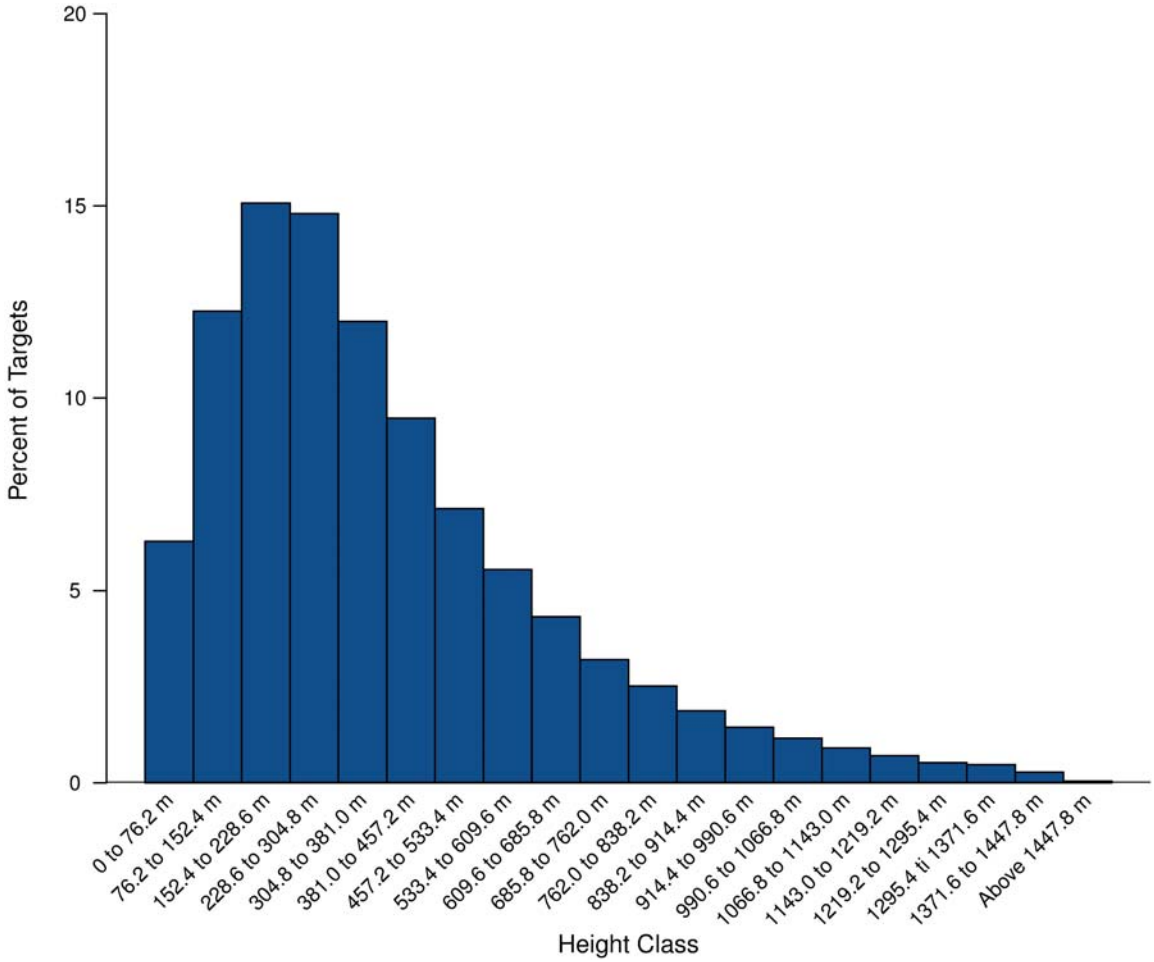

Figure 11. Frequency histogram of targets by height class (ARL) recorded during radar surveys at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012.

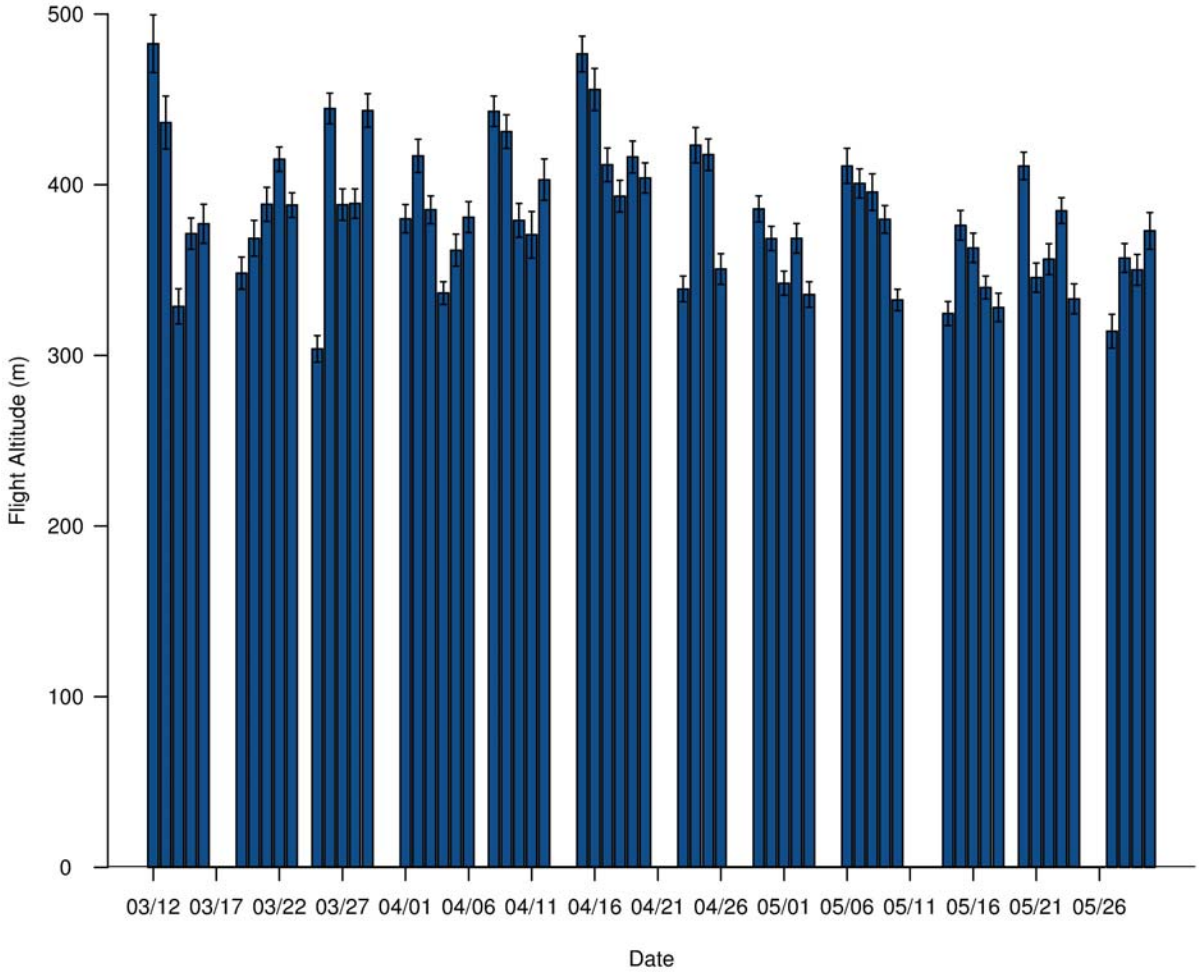

Figure 12. Mean ± 1 SE nightly flight altitude (ARL) recorded during radar surveys at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012.

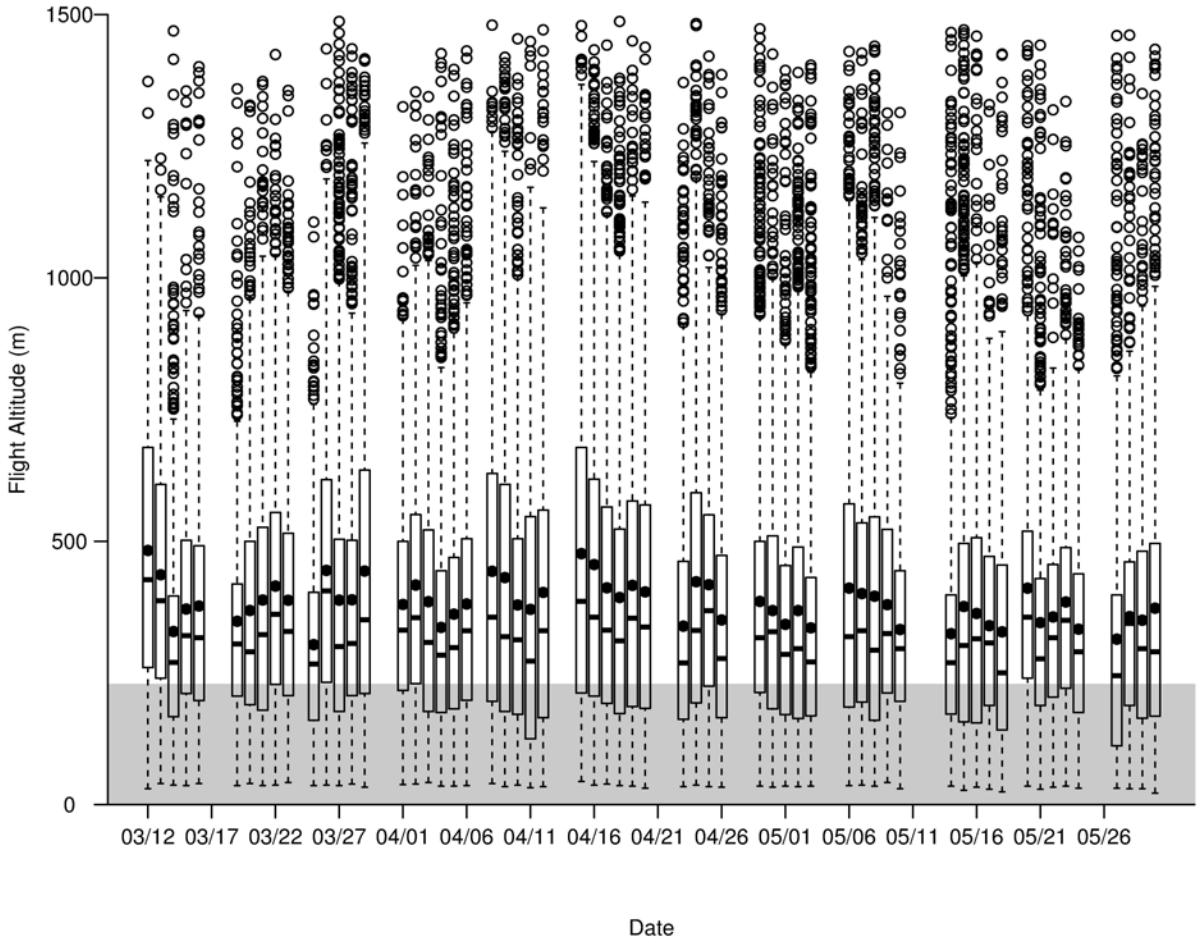

Figure 13. Boxplots showing nightly distribution of flight height (ARL) recorded during radar surveys at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012. Black circles represent mean height, black horizontal bars represent median height, while the shaded region indicates the expected height of the solar towers, 0 – 228.6 m (0 - 750 ft).

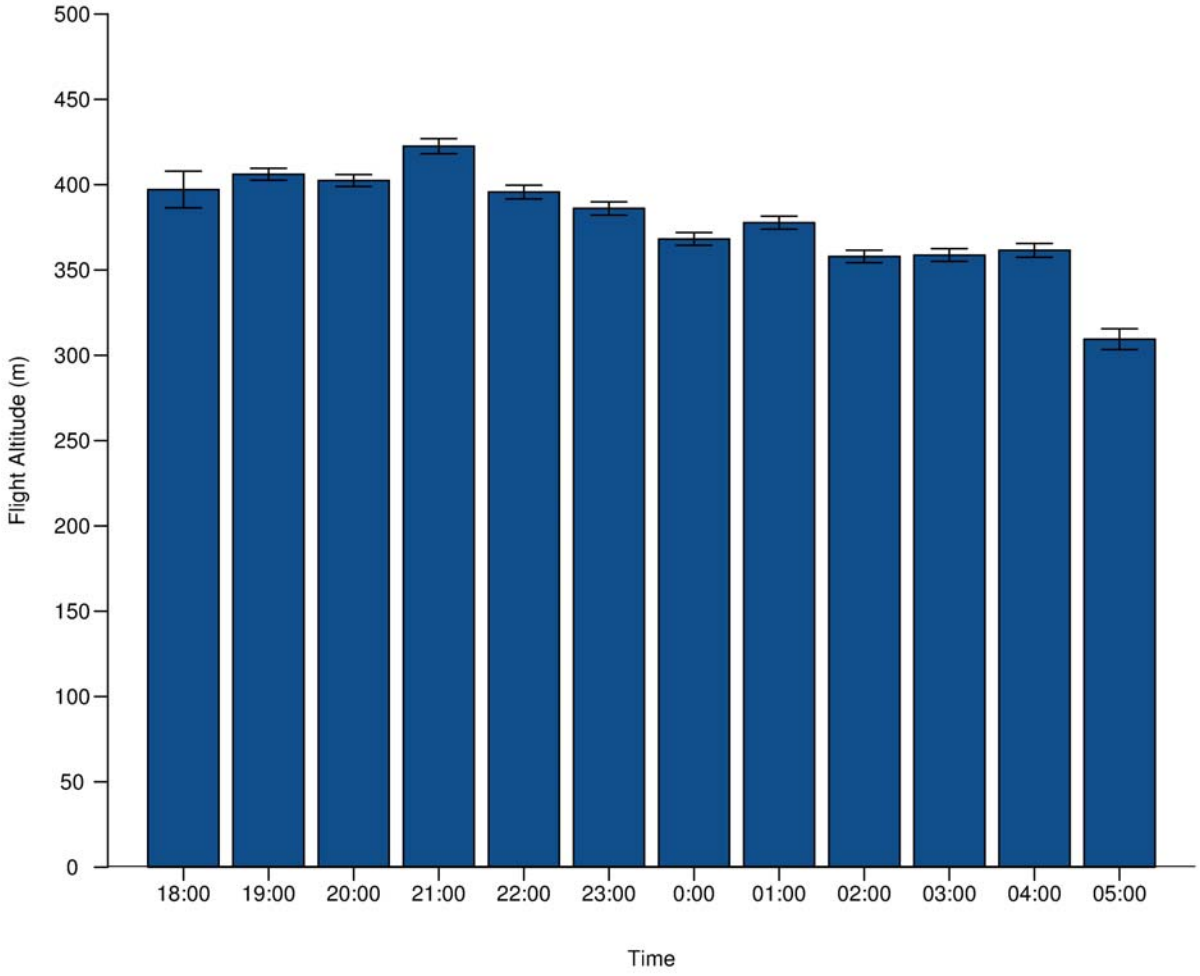

Figure 14. Mean ± 1.0 SE hourly flight altitude (ARL) recorded during radar surveys at the Rio Mesa Solar Electric Generating Facility Radar Study Area, spring 2012

DISCUSSION

Passage rates were the index of 'use' that was examined to define how many nocturnal migrants passed over the RMSEGF RSA during spring 2012. In this study, passage rates observed during the migrant radar surveys were used in three ways: 1) to provide information on the number of nocturnal migrants passing over the RMSEGF RSA; (2) to provide information on the temporal distribution of nocturnal migrants passing over the RMSEGF RSA; and (3) to assess the passage rate of nocturnal migrants flying within the height of the solar collection towers to be used in the RMSEGF (i.e., less than 229 m in altitude).

Passage Rates

The interpretation of radar data relative to collision risk is complex. Higher passage rates and low target altitudes observed during pre-construction studies, for example, have been shown not to correlate with an increased risk to avian species. A recent analysis of 15 seasonal nocturnal migration studies conducted since 1999 tested whether high passage rates and lower altitudes observed during pre-construction radar studies correlated with higher post-construction avian impact rates (Tidhar et al. 2010). The results of the analysis indicate that:

1. sites where a larger number of nocturnal targets were detected have not been found to generate correspondingly higher collision risks, and
2. lower flight heights do not correlate with higher numbers of collisions, which means that the cohort that appears to fly at or below tower height do not consistently exhibit increased collision rates.

Temporal Patterns

Within seasons, nocturnal migration often occurs as a pulse phenomenon (Alerstam 1990). In this study, there appeared to be nightly variability indicating many migratory pulses throughout the season. This may correspond to weather conditions, with birds taking advantage of air masses (weather fronts) that are moving in the direction the birds are migrating, or birds migrating ahead of a weather front so as to not be delayed by inclement weather. Typically, the majority of nocturnal migration takes place in weather which provides the ideal conditions of calm, light, or following winds, with relatively little cloud cover and good visibility, both prior to the time of departure and during the actual flight (Richardson 1978, Kerlinger and Moore 1989). The nightly variation in numbers of targets detected over the RSA is typical of avian migration studies conducted in the western United States and throughout the country.

Flight Altitudes

Many avian species migrate at night and most species migrate at heights greater than the height of the proposed solar collection towers, except during periods of inclement weather (NRC 2007). In general, nocturnal migrants travel at higher altitudes than diurnal migrants. Of the nocturnal migrants, most shorebirds and waterfowl fly higher on average than songbirds (NRC 2007). Passerines typically migrate at altitudes between 150 and 600 m (500 and 2,000 ft) (Deilein and Smithsonian Institution 2010, NWCC 2011). Most (approximately 66 percent) of the nocturnal migrants recorded passing over the RMSEGFRSA were flying above the height of the proposed power towers.

Relatively little is known about the flight heights of bats during migration, but bats are generally thought to migrate at heights lower than birds. However, flight height may be variable between species and between seasons. For example, hoary bats (*Lasiurus cinereus*) fly one to five m (3 to 16 ft) above the ground while migrating through New Mexico in the spring, but apparently not in the fall (Cryan and Veilleux 2007). In contrast, a hoary bat collided with an aircraft above

Oklahoma at an altitude of 2,438 m (8,000 ft) in October (Peurach 2003). However, it should be noted that outside of operating wind energy facilities, bats typically have no trouble avoiding collision with vertical structures (Timm 1989).

CONCLUSIONS

To WEST's knowledge, this is the first study to use marine radar to assess collision risk for migrating birds and bats at a proposed solar energy facility. In attempting to find similar objects (other than wind turbines) with which to compare the solar collection towers, other man-made structures that share some attributes in common with the towers were examined, such as: high-rise buildings, smokestacks, offshore oil platforms, and nuclear cooling towers. These structures are tall, lighted, and present a potential obstacle to birds and bats flying at night. In general, it has been found that birds can come into conflict with these structures primarily when visibility is poor aloft (e.g., fog, low clouds), causing birds to descend to lower altitudes in an effort to drop below the clouds (Cochran and Graber 1958). Relatively poor visibility combined with the outdated lighting regimes often employed at these facilities can lead to confusion among birds and bats flying near the structures. In these conditions birds and bats can: 1) successfully avoid the structures; 2) collide with the structures; or 3) experience light entrapment (Verheijen 1958, 1981). Light entrapment occurs when birds enter into the lighted area and due to comparatively poor visibility outside the lighted area and a reluctance to re-enter the darkness, the birds remain in the light, circling the structure, until they drop from exhaustion.

The results of recent studies have supported the idea that altering the lighting regimes employed at some structures can significantly lower the risks they pose to nocturnal migrant birds. In a study conducted in Michigan, Gehring et al. (2009) found that communication towers lit at night with only flashing red or white lights had significantly fewer avian fatalities than towers lit with a combination of steady-burning and flashing lights. Another study of 30 wind farms Kerlinger et al. (2010) found that turbines with Federal Aviation Administration (FAA) recommended flashing red lights had no more casualties than did towers with no lights. A study of an offshore oil facility, Poot et al. (2008) found that birds migrating at night, particularly in overcast conditions, were disoriented and attracted by red and white steady-burning lights, whereas they were less disoriented by blue and green lights. Poot et al. (2008) attributed this to the fact that migratory birds require light from the blue-green part of the spectrum for magnetic compass orientation, whereas red light (visible long-wavelength) disrupts magnetic orientation.

The FAA Airport Technology Research and Development Team has recently evaluated a proposal to omit or flash normally steady-burning red lights used at communication towers to warn pilots of the potential hazard as a measure to reduce potential avian impacts (Patterson 2012). The study also evaluated the potential benefit of using light-emitting diode lights at the towers instead of conventional incandescent lights. The results of the study indicated that flashing lights were acceptable for small towers (46 – 107 m [151 to 350 ft] in height) and that they could be omitted on taller towers (over 107 m) as long as the remaining brighter, flashing lights were operational. Based on the study, the FAA recently modified obstruction lighting standards to implement certain of the report recommendations. Based on these results, it is

recommended that the power towers at the RMSSEGF incorporate the obstruction lighting regime(s) recently recommended by the FAA (Patterson 2012).

With incorporation of the obstruction lighting regime, impacts to nocturnal migrant birds (and bats) posed by the proposed construction of solar collection towers at the Project site should be manageable.

Photo A. Radar van parked at sampling location at the Rio Mesa Solar Electric Generating Facility Radar Study Area. Antenna is in horizontal mode.

Photo B. Radar van parked at sampling location at the Rio Mesa Solar Electric Generating Facility Radar Study Area. Antenna is in vertical mode.

Photo C. Habitat: Cardinal directions (left to right) at the Rio Mesa Solar Electric Generating Facility Radar Study Area; top: N, NE, E; middle: SE, S, SW; and bottom: W and NW.

Eric A. Bailey

Project Biologist

Overview

Mr. Bailey has 22 years of experience as an environmental biologist. His responsibilities include focused surveys for California gnatcatcher, least Bell's vireo, arroyo southwestern toad, and desert tortoise; exotic predator removal, vegetation mapping; and technical report preparation in conformance with CEQA, NEPA, and ESA.

Areas of Expertise

Endangered Species Surveys
Exotic Predator Removal
Construction Monitoring
Biological Assessment

Years of Experience

With URS: 12 Years
With Other Firms: 14 Years

Education

California Teaching Credential, Life Science, California State University Chico, 1986

BA, Biological Sciences, California State University, 1984

Registration/Certification

U.S Fish and Wildlife Service Recovery Permit Number TE-101151-1. California Gnatcatcher; Presence/Absence Surveys, and Nest Monitoring.

Project Specific Experience

Endangered/Sensitive Species Surveys

Imperial Valley Solar: 10 mile linear transmission corridor and 6,500 acre solar site, Plaster City, CA, 2007-2010:
Conducted focused surveys for flat-tailed horned lizard and rare plant species. Also monitored geotechnical and drilling crews to ensure avoidance of impacts. Recorded horned lizard locations and scat locations for the project.

BrightSource Rio Mesa Solar Electric Generating Facility, Palo Verde, CA, 2011:
Conducted focused surveys for desert tortoise, recorded tortoise locations, health indicators, and scat/burrow locations for the project. Additional surveys performed for burrowing owl, migratory bird species, Mojave fringe-toed lizard, and jurisdictional wetlands.

AUSRA Solar Blunt-nosed Leopard Lizard Surveys, 2007-2008:
Conducted focused protocol surveys for blunt-nosed leopard lizard on 1.5 square mile site near Carrizo plain.

Emergency Storage Project, San Diego County Water Authority, San Diego, CA, 1995:
Conducted focused surveys for arroyo toad and California gnatcatcher. Survey area included vicinity of Lake Hodges and San Vicente Reservoir. Prepared portions of the Environmental Impact Report for the project.

Effects of Aircraft Noise on Least Bell's Vireo at Marine Corps Air Station Camp Pendleton, U.S. Department of the Navy, San Diego, CA, 1995:
Recorded behavioral data of least Bell's vireo biweekly over five months. Behavioral data was compared to onsite noise data to test for possible effects on the species by aircraft noise.

Colorado River Aqueduct, MWD of Southern California: 90 mile linear study area, 2004-2005:
Conducted focused surveys for desert tortoise and rare plant species. Recorded plant and tortoise locations, health indicators, and scat/burrow locations for the project.

Calico Solar: 27 mile linear telecommunication corridor and 25,000 acre study area, Daggett to Pisgah, CA, 2007-2010:
Conducted focused surveys for desert tortoise, recorded tortoise locations, health indicators, and scat/burrow locations for the project. Additional surveys performed for burrowing owl, golden eagle nests, and jurisdictional wetlands.

Naval Hospital Camp Pendleton Replacement and Main Exchange Mall Complex, CA, 2009:
Managed the field trapping effort for Pacific pocket mouse. On site contact and coordinator for six permitted trappers conducting over 2,700 "trap nights". Additional surveys performed for habitat assessments and vegetation community classification. Recorded species locations for the project and produced the Biological Assessment.

CalNev Pipeline Expansion: 234 mile linear petroleum pipeline corridor, Clark County, Nevada and San Bernardino County, CA, 2008-2010:
Conducted focused surveys for arroyo toad, western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and California gnatcatcher. Additional surveys performed for habitat assessments and vegetation community classification. Recorded species locations for the project and produced the Biological Technical Report.

County of San Diego Pamo Road Bridge Replacement Project, Ramona, CA, 2008:
Conducted focused surveys for arroyo toad and least Bell's vireo. Additional surveys performed for habitat assessments and vegetation community classification. Recorded species locations for the project and produced the Biological Technical Report.

San Mateo Lagoon Exotic Predator Control, San Clemente, CA, 2002:
Conducted surveys for arroyo toad, southwestern pond turtle, and tidewater goby. Managed field task to remove non-native predators from the lagoon. Species removed include bullfrog, crayfish, and catfish. Prepared summary report for the project.

Gregory Canyon Sensitive Species Surveys, Pala, CA, 1995:
Conducted focused surveys for arroyo toad, least Bell's vireo, and California gnatcatcher in and around proposed landfill site. Prepared Biological Technical Report for the project.

San Mateo Lagoon Exotic Predator Control, San Clemente, CA, 2005:
Provided mitigation required for Interstate 5 bridge widening at San Mateo Creek. Conducted surveys for arroyo toad, southwestern pond turtle, and tidewater goby. Managed field task to remove non-native predators from the lagoon. Species removed include bullfrog, crayfish, and catfish. Prepared summary report for the project.

Kinder Morgan Energy Partners Arroyo Toad Exclusion, Camp Pendleton, CA, 2002:
Conducted surveys for arroyo toad in and around pipeline construction area over a two-year period. Maintained pit traps and exclusion fencing to prevent take of arroyo toad. Conducted bullfrog removal from portions of San Mateo Creek.

Wylie Construction Sewage Treatment Facility, Camp Pendleton, CA, 2002:
Conducted focused surveys for arroyo toad in and around construction site. Maintained pit traps and exclusion fencing to prevent take of arroyo toad.

Solar I Desert Tortoise Surveys, Barstow, CA, 2007-2010:
Conducted focused surveys for desert tortoise. Recorded tortoise locations, health indicators, and scat/burrow locations for the project.

State Route 76 Highway Improvement Project, Bonsall, CA, 2003:
Conducted focused surveys for arroyo toad and California gnatcatcher. Additional surveys performed for habitat assessments. Recorded species locations for the project.

State Route 73 Water Quality Basins, Orange County, CA, 2002:
Conducted focused surveys for California gnatcatcher and monitored nest sites. Communicated with construction supervisors to avoid impacts to active nests. Prepared summary report for the project.

Multiple Species Conservation Plan (MSCP) California Gnatcatcher Population Census, San Diego, CA, 2001:
Conducted focused surveys for California gnatcatcher at conservation areas throughout San Diego County. Prepared final report of gnatcatcher population with discussion of the relative quality of the conservation areas.

Solar II Flat-tailed Horned Lizard Surveys, El Centro, CA, 2008:
Conducted focused surveys for flat-tailed horned lizard and desert horned lizard. Recorded horned lizard locations and scat locations for the project.

Saint Michael's School Construction, Poway, CA, 2002:
Conducted focused surveys for California gnatcatcher and delineated territorial boundaries relative to construction. Prepared project report detailing conservation efforts on-site.

Federal Emergency Management Agency (FEMA) Fire Fuel Control, San Bernardino and Glendale, CA, 2000-2001:
Conducted focused surveys for California gnatcatcher at proposed fire fuel management sites. Prepared final report for the project.

Rancho San Diego California Gnatcatcher Study, Home Capital Corporation, CA, 1992:
Collected behavioral field data on California gnatcatchers throughout the breeding and non-breeding seasons. Assisted in mist netting and color banding of approximately 114 individuals. Analyzed territory size data for a gnatcatcher population of approximately 25 pairs.

Miramar Landfill General Development Plan, City of San Diego, CA, 1993:
Conducted focused surveys for California gnatcatcher, San Diego fairy shrimp, San Diego mesa mint, San Diego button celery, and willowy monardella. Contributed to the biological technical report and environmental impact statement for the proposed facilities.

South County Landfills, City and County of San Diego, CA, 1994:
Conducted comprehensive field surveys for sensitive species and focused surveys for California gnatcatcher and arroyo southwestern toad in six proposed landfill sites. Prepared constraints level report for each site.

Southern California Edison Kramer-Victor Power Line Replacement: 32 mile linear transmission corridor, Kramer Junction to Victorville, CA, 1989-1991:
Conducted focused surveys for desert tortoise and rare plant species. Also monitored construction crews to ensure compliance with Memorandum of Understanding. Recorded tortoise locations, health indicators, and scat/burrow locations for the project.

Escondido Parks Master Plan, City of Escondido, Escondido, CA, 1990:
Conducted field surveys for sensitive biological resources in proposed park sites and conservation areas.

Upham San Marcos Project, Chester R. Upham, San Marcos, CA, 1992:
Participated in biological resources survey of 35-acre site. Collected vernal pool soil samples for a fairy shrimp re-hydration study. Contributed to biological technical report.

Biological Resource Inventory, City of Poway, CA, 1999:
Conducted focused surveys for California gnatcatcher throughout the city and sphere of influence. Mapped habitats and sensitive resources.

South Santa Fe Avenue Widening and Realignment, San Diego County Department of Public Works, San Diego, CA, 1999:
Conducted field surveys to determine the presence or absence of least Bell's vireo in the project area. Recorded faunal species list and provided photographic documentation of habitat quality.

Rancho Del Rey, City of Chula Vista, CA, 1999:
Participated in a vernal pool study that included floral inventory and soil sample collection for a fairy shrimp re-hydration study.

First San Diego River Improvement Plan, City of San Diego, CA, 1990-1994:
Managed field task to collect data on a 20-acre revegetation site. Data used to determine whether the project met required standards for success.

Construction Monitoring

San Elijo Hills Open Space Management, San Marcos, CA, 2007:
Monitored fire fuel management task, invasive weed removal, habitat restoration, and prevention of unauthorized dumping. Conducted yearly on-site population census of California gnatcatcher to measure success of the conservation effort. Prepared yearly summary report.

Biological Construction Monitoring for Olivenhain Reservoir, CA, 2005:
Project biologist monitoring California gnatcatcher nesting locations in relation to construction activity. This information allowed client to avoid impacts to Federally-listed Threatened California gnatcatcher.

Biological Construction Monitoring for Dana Point Headlands, CA, 2006-2011:
Project biologist monitoring California gnatcatcher nesting locations in relation to construction activity, public use areas, and conserved habitat. This information allowed client to avoid impacts to Federally-listed Threatened California gnatcatcher, and to measure the success of the project conservation effort.

Gregory Canyon Geotechnical Studies, Pala, CA, 2009:
Conducted biological monitoring to ensure avoidance of impacts to arroyo toad along the San Luis Rey River. Coordinated with geotechnical personal to ensure that geotechnical access routes and activities did not affect arroyo toad.

Biological Construction Monitoring for VertRep Facility, U.S. Navy/Stronghold Electric, CA, 1999:
Project biologist monitoring construction of a helicopter landing facility. Vernal pools, coastal sage scrub, and California gnatcatchers were the resources protected.

Biological Construction Monitoring of San Elijo Hills, San Elijo Hills, LCC, CA, 2004:
Implemented monitoring of wetlands permit conditions.

California Gnatcatcher Study, Skyline Wesleyan Lutheran Church, CA, 1993:
Collected field data to assess construction noise impacts on the species over three years. Mist netted and color banded gnatcatchers within the study area. Delineated territories on site and recorded breeding behavior, nesting success, and dispersal of young. Prepared a letter report detailing the breeding home range of each pair onsite prior to construction.

Kramer-Victor Powerline, Southern California Edison, CA, 1989:
Conducted surveys for desert tortoise, Mojave ground squirrel, and rare plants along the Kramer-Victor power corridor. Additionally, monitored construction crews to prevent take of desert tortoise.

Biological Assessment

Escondido Parks Master Plan, City of Escondido, Escondido, CA, 1990:
Conducted field surveys for sensitive biological resources in proposed park sites and conservation areas.

Upham San Marcos Project, Chester R. Upham, San Marcos, CA, 1992:
Participated in biological resources survey of 35-acre site. Collected vernal pool soil samples for a fairy shrimp re-hydration study. Contributed to biological technical report.

Biological Resource Inventory, City of Poway, CA, 1990:
Conducted focused surveys for California gnatcatcher throughout the city and sphere of influence. Mapped habitats and sensitive resources.

South Santa Fe Avenue Widening and Realignment, San Diego County Department of Public Works, San Diego, CA, 1999:
Conducted field surveys to determine the presence or absence of least Bell's vireo in the project area. Recorded faunal species list and provided photographic documentation of habitat quality.

Rancho Del Rey, City of Chula Vista, Chula Vista, CA, 1990:
Participated in a vernal pool study that included floral inventory and soil sample collection for a fairy shrimp re-hydration study.

First San Diego River Improvement Plan, City of San Diego, San Diego, CA, 1990-1994:
Managed field task to collect data on a 20-acre revegetation site. Data used to determine whether the project met required standards for success.

Specialized Training

July/2010, California Department of Fish and Game Authorization/July, 2010/Flat-tailed Horned Lizard (Phrynosoma mcallii); Presence/Absence Surveys, Handling for Data Collection, and Transport out of Harm's Way during Construction Monitoring.

Recovery Permit, U.S. Fish and Wildlife Service Recovery Permit Number TE-101151-2. California Gnatcatcher; Presence/Absence Surveys, and Nest Monitoring.

Publications

Dispersal Capability of the California Gnatcatcher: A Landscape Analysis of Distribution Data. Western Birds 29:351-360, 1998. (P. Mock, coauthor).

California Gnatcatcher Territorial Behavior. Western Birds 29:242-257, 1998. (M. Grishaver, K. Preston, P. Mock, and D. King, coauthors).

Contact Information

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RELEVANT QUALIFICATIONS

Years of Experience

Education
BS, University of California, Santa Cruz - 2005

Expertise
Focused Avian Surveys, Bird Banding, Point Count, Avian Habitat Assessments and Avian Monitoring

KEY QUALIFICATIONS

Mr. Matt Brady is experienced in the identification of North American species of birds by both sight and sound, with an emphasis on the birds of California. Mr. Brady has extensive experience in identification of Neotropical and Asian birds. As a bird bander with emphasis in passerines, Mr. Brady has banded upwards of 4,000 individuals. To that end, Mr. Brady is an expert in the utilization of a variety of scientific survey methods, including strip transect, line transect, point counts, area searches, collecting blood samples and mist-netting.

Biologist
Yosemite National Park
As an Ornithologist at the Yosemite National Park Mr. Brady performed nest searching and monitoring, point counts, and nocturnal owl surveys.

Biologist
Point Reyes Bird Observatory Conservation Sciences Land bird Division
Mr. Brady performed studies on Southeast Farallon Island for seven fall seasons. Duties included mist-netting, banding and color banding, intense area search censuses by both sight and sound for passerines. Mr. Brady banded over 1,200 individual birds at the Southeast Farallon Island. Additional responsibilities included supporting the Management Indicator Species (MIS) Project by performing point counts surveys at several National Forests in the central Sierra Nevada of California (targeted Mountain Quail and Hairy Woodpecker).

Biologist
La Selva Biological Research Station
In support of research for Tulane University, Mr. Brady located territories of Chestnut-backed Antbird (*Myrmeciza exsul*), set up mist-nets, operated playback equipment, captured Antbirds, banding them, and collected blood samples.

Biologist
Hemlock Hill Field Station
In support of research for York University Mr. Brady located male Wood Thrush (*Hylocichla mustelina*) by song, set up mist-nets, and captured Wood Thrush using play back techniques for banding collecting blood samples for hormone analysis. Additional responsibilities included applying radio transmitters and geolocators on banded Wood Thrush, and tracking/monitoring their behavior.

Biologist
University of California, Santa Cruz Campus
In support of research for UC Santa Cruz, Mr Brady conducted point counts as part of University efforts to monitor the effects of development on local avain populations. Duties included setting up point counts and conducting species diversity and abundance surveys.

RELEVANT QUALIFICATIONS

Years of Experience
13

Education
Ph.D. Biology 2011 Loma Linda University

B.A. Environmental Studies 2000 Pitzer College – Claremont Colleges

Expertise
Raptors, Herpetology and Regulatory Compliance

Certifications
•Falconry License / 2008 - United States Fish and Wildlife Service
•Flat-tailed Horned Lizard Biologist / 2008 – Bureau of Land Management
•Authorized Barefoot Banded Gecko Biologist / 2009 – California Department of Fish and Game
•Authorized Desert Tortoise Biologist / 2000 – United States Fish and Wildlife Service
•Authorized Arroyo Toad Biologist / 2000 – United States Fish and Wildlife Service
•Scientific Collecting Permit / 2003 – California Department of Fish and Game

KEY QUALIFICATIONS

Dr. Eric Dugan is a federal and State permitted falconer and has logged several hundred hours handling raptors. Dr. Dugan possesses an undergraduate degree in Environmental Studies, and holds a PhD in Biology. In addition to authoring 14 publications, Dr. Dugan has more than 13 years of experience in natural resource management, research, conservation and environmental compliance. Dr. Dugan has worked extensively in California, Arizona, and Nevada on a variety of high visibility and complicated projects; performing threatened and endangered species surveys for raptors, song birds and compliance monitoring.

Wildlife Biologist

Wind Energy Whitewater Canyon Project

Dr. Dugan was the lead field biologist for nesting raptor surveys. Tasks included surveying for the presence of nesting raptors, identification of species, and mapping in Whitewater Canyon.

Wildlife Biologist

Schuyler Heim Bridge Replacement Project

Dr. Dugan is involved in the temporary relocation of an active breeding pair of Peregrine Falcons (*Falco peregrinus*) from the Heim Bridge to an adjacent structure. He is currently supporting biological monitoring efforts during construction, including a worker environmental awareness training program; and assisting with the implementing a project specific Take Avoidance, Avian Protection, and Relocation Plan which provides a framework for long term/adaptive management of raptors within the Ports and details monitoring specifications, and contingency provisions if pending relocation efforts fail.

Wildlife Biologist

Sunrise Powerlink Project

Authorized Project Biologist responsible for data collection associated with migratory bird abundance and diversity for work in habitat of the state Threatened Barefoot Banded Gecko (*Coleonyx switaki*). Dr. Dugan provided habitat assessments, pre-construction clearances surveys and permit compliance monitoring throughout construction efforts in the In-Ko-Pah Mountains, Imperial County, CA.

Wildlife Biologist

Marine Corps Base Camp Pendleton Installation Remediation Program

Dr. Dugan served as Lead biologist for numerous installation remediation sites on the installation and supported removal of underground burn-ash deposits and restoration of native habitats. Sensitive species surveys included the Arroyo Toad (*Bufo californicus*), California Gnatcatcher (*Polioptila californica*), and Least Bell's Vireo (*Vireo bellii pusillus*). Dr. Dugan was also the Lead biologist for numerous Installation Remediation Sites contaminated with burn ash and toxic materials and performed surveys and mitigation monitoring during the removal of burn ash. Sensitive species for this work included the California Gnatcatcher, Least Bell's Vireo and Arroyo Toad.

Patrick Lee Hord

Wildlife Biologist
9712 Snow View Drive, El Cajon, CA 92021
(858) 220-4732
chatamour7@yahoo.com

Patrick Hord's nine years of experience as a wildlife biologist includes nesting and migratory bird surveys; focused sensitive species surveys and monitoring including the Least Bells vireo, California gnatcatcher, Burrowing owl, flat tailed horned lizard, and Arroyo toad. His expertise also includes point count and raptor surveys, native plant surveys, construction monitoring, fuel management monitoring, mitigation monitoring, and GPS mapping.

He has worked with and handled California native wildlife as the Executive Director of a licensed California wildlife rehabilitation center. He is also co-owner of a wildlife exclusion and humane pest control service.

Mr. Hord is a San Diego native and has extensive experience as a licensed California General Building and Millwork Contractor; he has advanced skills and a comprehensive knowledge of all phases of the construction industry for both residential and commercial projects including planning, design, compliance, supervision, and maintenance.

Work Experience

Wildlife Biologist, Chambers Group Inc. ● October 2011 Present

San Diego Gas & Electric - Sunrise Power Link Project. Avian team member. Presence and absence, nesting bird surveys. Construction monitoring for large scale electric transmission project including daily reporting. Monitor environmental compliance in habitats ranging from desert scrub in Imperial County to coastal sage scrub in San Diego.

Birds Observed:

Golden eagle, Bald eagle, Cooper's hawk, Peregrine falcon, White-tailed kite, Merlin, Northern Harrier, Osprey, Harris's hawk, Turkey vulture, Red-shouldered hawk, Red-tailed Hawk, American kestrel, Blue-gray Gnatcatcher, California gnatcatcher, Mallard, Cinnamon Teal, Bushtit, Mourning dove, Western scrub Jay, Common raven, White-crowned sparrow, California towhee, Cliff swallow, Spotted towhee, Lesser goldfinch, American goldfinch, House finch, Northern mockingbird, California thrasher, Oak titmouse, Yellow-rumped Warbler, Wrentit, Anna's hummingbird, Costa's hummingbird, Black-chinned hummingbird, Ash-throated flycatcher, Black phoebe, Say's phoebe, Bewick's wren, Yellow-rumped warbler, Western kingbird, Cassin's kingbird, Common poorwill, Golden-crowned sparrow, Northern mockingbird, Rock wren, Western bluebird, California quail, Lark sparrow, Acorn woodpecker, Nuttall's woodpecker, Northern flicker, Rufous-crowned sparrow, Killdeer, American Coot, Phainopepla, Greater roadrunner, Wilson's warbler, Black -headed gross beak, Loggerhead shrike, Yellow warbler.

Wildlife Biologist, Geomorphis Information Sys, LLC ● June – July 2011

Southern California Edison - Tehachapi Renewable Transmission Project. Pre-construction surveys, bird surveys and nest monitoring, and construction monitoring on Segments 4, 5 and 11 - Mojave desert.

Wildlife Biologist, Owens Wildlife Biology, LLC ● 2006 – 2012

Nesting bird, raptor surveys, point count surveys and other sensitive species surveys. GPS mapping and perimeter flagging, general and sensitive species surveys for mitigation and Habitat Conservation Plan sites, construction monitoring, fuel management monitoring.

Also experienced in sensitive plant species mapping in desert scrub, Coastal sage scrub, mixed chaparral, oak woodland, riparian woodland, native & non-native grassland, fresh water marsh, among others.

Assisted with nest monitoring for California gnatcatcher and Least Bell's vireo, conducted daytime and night time Arroyo toad surveys.

Relevant Experience for Owens Wildlife Biology:

Our Lady of Mount Carmel Catholic Church Development Project, San Diego, CA, 2011 ● *General surveys for sensitive species (birds, mammals, herps, butterflies); nesting bird surveys, assistance with California gnatcatcher (CAGN) protocol surveys, CAGN nest monitoring, construction monitoring.*

The Escondido Creek Conservancy San Elijo and Greenlands Perpetual Land Management Plan San Marcos; Escondido CA 2009 – 2011 ● *Annual general surveys for sensitive species (birds, mammals, herpetiles, butterflies); nesting bird surveys, assistance with California gnatcatcher protocol surveys, point count surveys, habitat mapping, GPS.*

Horsethief Fuel Management Project, Alpine, CA, 2011 ● *Construction monitoring. Presence and absence bird surveys, nesting bird surveys, nest monitoring. GPS perimeter flagging, GPS sensitive plant mapping. Included surveys for Arroyo toad which were found on site, establish and monitor MTBA listed nesting bird buffer zones for construction.*

Habitat:

400 acres Mixed chaparral, Oak woodland, Engelmann Oak woodland, Riparian woodland, Riparian willow scrub, native & non-native grassland and fresh water marsh habitats.

Bird species observed:

Blue-gray gnatcatcher, Red-tailed Hawk, Bushtit, Common poorwill, Turkey vulture, Mourning dove, Western scrub Jay, Common raven, White-crowned sparrow, California towhee, Golden crowned sparrow, Spotted towhee, Lesser goldfinch, American goldfinch, House finch, Cliff swallow, Northern mockingbird, California thrasher, Oak titmouse, Yellow-rumped warbler, Wrentit, Anna's hummingbird, Costa's hummingbird, Ash-throated flycatcher, Black phoebe, Rock wren, Bewick's wren, Western bluebird.

Nesting birds observed:

Red tailed Hawk, Western bluebird, House wren, Cooper's hawk, Anna's hummingbird.

Threatened and Endangered:

Arroyo toad.

Ocotillo Express Wind Farm, Ocotillo, CA, 2010 ● *Assisted with point count surveys, migratory bird and raptor surveys, Burrowing owl surveys, flat tailed horned lizard surveys for preparation of EIR and EIS on Bureau of Land Management land in various desert habitats.*

Victoria Vegetation Fuel Management Project, Alpine, CA, 2010 ● *Construction monitoring, nesting bird and other sensitive species surveys, GPS perimeter flagging, GPS sensitive plant mapping, establish and monitor MTBA listed nesting bird buffer zones for construction.*

Habitat:

100 acres Mixed Chaparral, Oak woodland, Riparian woodland, Riparian willow scrub.

Bird species observed:

Say's phoebe, Cooper's hawk, Blue-gray Gnatcatcher, Red-tailed Hawk, Bushtit, Turkey vulture, Mourning dove, Western scrub Jay, Common raven, White-crowned sparrow, California towhee, California towhee, Spotted towhee, Lesser goldfinch, American goldfinch, House finch, Northern mockingbird, California thrasher, Oak titmouse, Yellow-rumped Warbler, Wrentit, Anna's hummingbird, Costa's hummingbird, Ash-Throated flycatcher, Black phoebe, Bewick's wren, Yellow-rumped warbler, Western kingbird,

Nesting birds observed:

Yellow-rumped warbler, Anna's hummingbird, Spotted towhee, Red-tailed hawk, American goldfinch, Bushtit.

California Fire Safe Council Fuel Management Projects, Alpine, CA 2009 – 2010 ● *Construction monitoring, nesting bird and other sensitive species surveys, GPS perimeter flagging, GPS sensitive plant mapping, establish and monitor MTBA listed nesting bird buffer zones for construction.*

Sky Ranch Development, Santee, CA, 2007 – 2008 ● *Assisted with California gnatcatcher protocol surveys, CAGN nest monitoring for 340+ acre development.*

Habitat:

Mixed chaparral and Coastal Sage scrub.

Bird species observed:

American Kestrel, California Gnatcatcher, Red-tailed Hawk, Bushtit, Common poorwill, Turkey vulture, Mourning dove, Western scrub Jay, Common raven, White-crowned Sparrow, California towhee, Golden-crowned sparrow, Spotted towhee, Lesser goldfinch, American goldfinch, House finch, Northern rough-wing swallow, Northern mockingbird, California thrasher, Yellow-rumped Warbler, Wrentit, Anna's hummingbird, Costa's hummingbird, Ash-throated Flycatcher, Black phoebe, Bewick's wren, Greater roadrunner.

Nesting birds observed:

5 California Gnatcatcher nests/territories.

Threatened and Endangered:
California gnatcatcher.

Installation Restoration Program at Marine Corp Air Station, El Toro, CA 2006 - 2007 ● *Assisted with California gnatcatcher protocol surveys and nest monitoring, nesting bird surveys, establish and monitor MTBA listed nesting bird buffer zones for construction for 400+ acre development.*

Habitat:
Coastal Sage scrub

Bird species observed:
Burrowing owl, Lesser Nighthawk, Red-tailed Hawk, Bushtit, Turkey vulture, Western scrub Jay, Common raven, California towhee, Golden crowned sparrow, Spotted towhee, House finch, Northern mockingbird, California thrasher, Oak titmouse, Wrentit, Anna's hummingbird, Costa's hummingbird, Black phoebe, Rock wren, Bewick's wren,

Nesting birds observed:
California Gnatcatcher.

Nesting birds observed:
Burrowing owl, CAGN.

Sensitive, Threatened and Endangered species observed:
Nine California Gnatcatcher nests monitored.

Quarry Creek Project, Oceanside, CA, 2007 ● *Assisted in protocol Least Bells Vireo (LBV) surveys for proposed development and expansion of quarry, general sensitive species surveys, LBV detected on site.*

Habitat:
Riparian willow scrub. Transitional Coastal Sage scrub.

Bird species observed:
Red-tailed Hawk, Bushtit, Turkey vulture, Mourning dove, Western scrub Jay, Common raven, California towhee, Spotted towhee, Lesser goldfinch, American goldfinch, House finch, Cliff swallow, Northern mockingbird, Oak titmouse, Yellow-rumped Warbler, Wrentit, Anna's hummingbird, Ash-throated Flycatcher, Black phoebe, Bewick's wren, Yellow-breasted chat, Wilson's warbler, Common yellowthroat.

Threatened and Endangered:
Least Bells Vireo, California Gantcatcher.

Guejito Ranch, Escondido/Valley Center, CA, 2006 ● *General bird and Arroyo toad protocol day and nighttime surveys, Arroyo toads detected on site.*

Habitat:

Riparian willow scrub.

Bird species observed:

Red-tailed hawk, Red-shouldered hawk, Cooper's hawk, White-tailed kite, Bushtit, Great egret, Lazuli bunting, Turkey vulture, Killdeer, Mourning dove, Scrub jay, Common raven, American crow, California towhee, White-crowned sparrow, Rufous crowned sparrow, Song sparrow, American kestrel, House finch, Lesser goldfinch, Bullock's oriole, Cliff swallow, Northern rough-wing swallow, Western meadowlark, Northern mockingbird, Wrentit, Western bluebird, Yellow-rumped Warbler, California quail, Wild turkey, Acorn woodpecker, Nutall's woodpecker, Great horned owl, Anna's hummingbird, House wren, Cassin's kingbird, Pacific-slope (Western) flycatcher, Western kingbird, Ash-throated flycatcher, Black phoebe, Barn owl, Wild turkey.

Threatened and Endangered:

Arroyo toads.

Native Wildlife Solutions ● July 2008 – Present

Co-owner of humane wildlife exclusion service Native Wildlife Solutions covering all of San Diego County; includes removal and exclusion of various vertebrate species, from structures, developed properties; and educational presentations for HOAs and related groups.

Executive Director, The Wildlife Center of Silicon Valley ● February – July 2008

Responsible for staff, 100 volunteers and the overall operation a Wildlife Rehabilitation hospital non-profit organization with budget of over $400 k. Fundraiser; developed policies, procedures and master plan. Handled various native wildlife in rehabilitation and field settings.

Executive Director and Co-founder, La Jolla Friends of the Seals ● May 1999 – May 2002

Established California non-profit educational. Trained and managed over 300 volunteer docents to promote positive public education and understanding of local wildlife and habitats.

General Building and Millwork Contractor, La Jolla Woodworks ● 1982 – 1997

Owner and supervisor of licensed construction company, experienced in all phases and modes of building construction and remodel for residential and commercial projects.

Education

Imperial Valley College. Course in Environmental Science, Brawley, CA
B.A. History, San Diego State University, San Diego, CA
San Diego Mesa College, San Diego, CA

Awards and Certifications

National Oceanic and Atmospheric Administration's Environmental Hero Award, 2000
California General Building & Millwork Contractor License B1 & C6 CSLB # 536150 ● 1990 - 1996

Professional and Community Affiliations

Association for Environmental Professionals, member
Wildlife Society, member
Citizens Advisory Committee member (former), Los Peñasquitos Canyon Preserve ● 2009 - 2010
Emergency Wildlife Rehab Volunteer, Lakeside, CA. 2003

Safety Training

Helicopter safety, 2011
CPR

References

Available upon request

Phillip Howard

Wildlife Biologist

Areas of Expertise

Ornithology
Wildlife Biology
Ecology
Environmental Consulting
Endangered Species, ESA
CEQA/NEPA, MBTA, Statistics
Mitigation, Field Studies

Years of Experience

With URS: 1 year
With Other Firms: 5 years

Education

M.S. Conservation Biology, 2010
Antioch University New England
Keene, NH
Thesis: Wintering ecology of migrant songbirds in St. Martin, West Indies

B.S. Environmental Studies, 2008
Shepherd University
Shepherdstown, WV
Concentration: Resource Management
Sr. Project: Impact of Surface Coal Mining on Bird Populations in WV, 1994-2006

Overview

Mr. Howard has experience as a biologist in a variety of sensitive habitats throughout the western hemisphere and a master's degree in conservation biology. Mr. Howard is grounded in both the applied and theoretical aspects of conservation, ecology, and policy design. He has conducted several large scale bird surveys performing nest searching, misting netting and banding of passerine, near passerine and seabird species leading to production of multiple professional papers in conformance with CEQA/NEPA, MBTA, CWA, and ESA. Over the course of his career Mr. Howard has banded nearly 1,000 birds and monitored nesting behavior from over 100 species. Additionally, Mr. Howard has experience with the application of GPS/GIS software and statistical analysis.

Project Specific Experience

Rio Mesa Solar Electric Generating Facility (SEGF) Widlife Biologist, March 2012 – Ongoing. 5,750 acre, 750 megawatt solar complex located near Blythe, CA. Field lead for Rio Mesa Brightsource Energy migratory bird observation points, line-transects and focal surveys for CA State listed Gila Woodpecker. Assisted in client data requests and interacted with multiple agencies to insure survey design and implementation met migratory bird monitoring needs.

Sunrise Powerlink, Avian Biologist, March 2011 – March 2012. 117-mile, $1.883 billion 500-kilovolt electric "superhighway" from Imperial County to San Diego with 1,000 megawatt capacity. Performed nesting bird surveys and nest monitoring for the entire Sunrise Powerlink right-of-way, as well as Reconductor lines, and various substation upgrades from El Centro to San Diego, including areas of Oceanside, Chula Vista, and Carlsbad, California. Surveyed for all non-listed species, raptors and federally/state listed species (Burrowing Owl, Coastal California Gnatcatcher, Least Bell's Vireo, and Southwestern Willow Flycatcher). Designed and implemented bird buffers to reduce incidental take to nesting eagles and other populations of migratory birds from a variety of sunrise related construction activities.

Additional responsibilities included the preparation of the Sunrise PowerLink Nesting Bird Management and Monitoring Plan submitted to CPUC and BLM. The goal of this plan were to minimize construction related impacts on nesting birds, while remaining compliant with the project's environmental mitigation measures.

Professional Societies/Affiliates

Association of Field Ornithologists
Society for Conservation Biology
Western Field Ornithologists
Wildlife Society

Wilson Ornithological Society

Awards

2009 Center for Tropical Ecology and Conservation Student Scholarship Grant for research project in Grenada

Languages

English

Specialized Training

May 2011 San Diego, CA
Nest searching and monitoring training workshop by Bloom Biological

April 2011 San Diego, CA
Nesting bird survey training by Chambers Group

March 2011 San Diego, CA
Training courses on Fire Prevention, SWEAP, Helicopter Safety, UXO, BMcD Safety, and Stormwater Prevention by Chambers Group

Publications

Phillip J. Howard and Adam Brown (2012). Nearctic-neotropical migrant wood-warbler populations in St. Martin, West Indies. The Journal of Caribbean Ornithology. [Accepted 2012].

Phillip J. Howard and Sarah C. Harvey (2012). Common nesting habitat and fledging weights for Wedge-tailed Shearwater on Tern Island. Western Birds. [In review]

Phillip J. Howard and Paula Hartzell. (2010) Analyses of the Effectiveness of Seawall Filling to Reduce Entrapments: 2001-2010 Tern Island, French Frigate Shoals, Hawaiian Islands National Wildlife Refuge, Papahānaumokuākea Marine National Monument. [Prepared for US Fish and Wildlife Service]

Phillip J. Howard. (2010) Wintering ecology of migrant songbirds in St. Martin, West Indies. [M.S. Thesis. Antioch University New England, NH]

Emily Beck, Mari Clemmer, Kevin Devine, Stephen Dialessi, Katrina Giese, Stephanie Goggin, Addison Helmke, Phillip Howard, Lila Joa, Rachel Laurie, Melissa Keevil, Tania Schusler, Sarah Stoner-Duncan, Christina Varnold and Jennifer Young (2009)

Mount Monadnock: Exploring Educational Possibilities and Stakeholder Interests. [Prepared for Antioch University New England and Monadnock Ecological Research and Education]

Phillip J. Howard, Tamarra Martz and Beth Kaplin. (2008) Nyungwe National Park Chimpanzee Fact Sheet. [Brochure]

Phillip J. Howard, Tamarra Martz and Beth Kaplin. (2008) Nyungwe National Park Bird Check-List. [Brochure]

Chronology

03/2012 - Present. URS Corporation. San Diego, CA
Wildlife Biologist

Field lead for Rio Mesa Brightsource Energy migratory bird observation points, line-transects and focal surveys for CA State listed Gila Woodpecker.

03/2011 - 03/2012. Chambers Group Inc. San Diego, CA.
Avian Biologist

Performed pre-construction nesting bird surveys, nest monitoring and report writing. Surveyed for federally and/or state listed avian species (coastal California gnatcatcher, least Bell's vireo, golden eagle and willow flycatcher).

06/2010 - 12/2010. U.S. Fish and Wildlife Service. Tern Island, French Frigate Shoals, Northwestern Hawaiian Islands
Seabird Biologist

Monitored productivity success of breeding seabirds, captured and banded seabirds, conducted invasive-species removal and herbicide application, and designed a project researching the fledgling ecology of Wedge-tailed Shearwaters.

01/2010 - 06/2010. North Carolina State. Puerto Rico
Avian Field Assistant

Set-up MAPS stations for mist netting passerines and near passerines in Puerto Rico. Fitted focal study species with radio transmitters. Preformed point counts, radio telemetry, nest searching, and fruit surveys.

08/2009 - 10/2009. Antioch University New England. Keene, NH
Assistant bird bander

Mist netted passerines and near passerines following MAPS protocol. Collected banding data (age, sex, molt limits, skull ossification, weight, and any additional notes about plumage or abnormal characteristics) and color-banded focal species.

05/2009 - 08/2009. Grenada Cocoa Association and L.A. Burdick Chocolate. Grenada, West Indies
Lead Researcher.

Designed and conducted a research project to document the distribution of cocoa, determine environmental factors influencing distribution cocoa varieties, establish a base-line for future gastronomic analysis of cocoa varieties, and promote conservation of high quality cocoa for both economic and biological value. Organized a local research team of Grenada Cocoa Association extension agents to perform vegetation surveys and collect GPS data.

09/2008 - 12/2009. Center for Tropical Ecology and Conservation. Keene, NH
Research Assistant.

Assist CTEC directors with research projects, literature searches, fund raising and report writing. Created Chimpanzee fact sheet and bird check-list for Nyungwe National Park, Rwanda.

05/2007 - 08/2007. U.S. Fish and Wildlife Service. Shepherdstown, WV.
Intern

Intern for the USFWS national archives; created an online digital library of historic glass bird slides.

Contact Information

Phillip Howard
URS Corporation
4225 Executive Square, Suite 1600
La Jolla, CA 92037
Cell: 301.642.8433
Email: Phillip.Howard@urs.com

Ingrid Klongland
Lead Biologist

EDUCATION
B.A. Geography, 2007, University Of Wisconsin-Platteville
Major: Geography
Minor: Environmental Sciences

CERTIFICATIONS &TRAINING
USFWS Authorized Desert Tortoise Biologist in NV, CA, and UT
NDOW Special Purpose Permit for Desert Tortoises and Gila Monsters
First Aid and CPR

EMPLOYED AT SNEI
1 Year 3 Months

YEARS AS PROFESSIONAL BIOLOGIST
3+ Years

PROFESSIONAL RESPONSIBILITIES

- Provide Endangered Species Act Section 7 and Section 10 compliance consultations and perform mitigation actions as necessary.
- Coordination with the Agencies, the Contractors and the project proponent to ensure project-wide compliance with the protective measures stated in the biological opinion.
- Oversee daily project activities and manage logistic to ensure the activities and staffing levels are in accordance with the Biological Opinion.
- Work directly with the contractor to find appropriate solutions to project problems and the strategies to implement the solutions.
- Manage and mobilize teams of authorized biologists to meet our clients ever changing needs.
- Write project status reports for clients and overseeing agencies.
- Participate in desert tortoise clearances and surveys.
- Perform Biological Surveys for threatened, endangered and sensitive species (federal and state-listed species of concern).
- Provide Migratory Bird Treaty Act compliance consultations and perform mitigation actions as necessary.

PROFESSIONAL EXPERIENCE

- Perform Section 7 and Section 10 mitigation in accordance with the protocols set forth by USFWS Biological Opinions and Habitat Conservation Plans.
- Ability to locate and document all signs of the desert tortoise including: nests, scat, tracks, burrows, dens, courtship rings, drinking sites, carcasses, and shell and egg fragments.
- Perform inspections of desert tortoise exclusionary fencing.
- Ability to use a probing camera to effectively excavate animal burrows.
- Able to use a dichotomous key to identify unrecognizable flora and fauna of the southwest.
- Conducted surveys for noxious/invasive weeds for Weed Risk Assessments and Weed Management Plans.
- Able to attach and remove VHF radio-transmitters to desert tortoises as specified by USFWS protocol.
- Able to track and locate desert tortoises using radio-telemetry.
- Conduct habitat surveys for translocation sites of desert tortoises.
- Ability to use aseptic technique to health assess, draw blood, measure and weigh, notch, and oral swab desert tortoises as specified by USFWS protocol.

- Conducted radio-telemetry triangulation on Oceola wild turkeys (*Meleagris gallopavo osceola*), which also included banding, fixing backpack transmitters, injecting vitamin E, and weighing turkeys as specified by Florida Fish and Wildlife Conservation Commission (FWC) protocol.
- Conduced habitat and vegetation surveys for Oceola wild turkeys.
- Volunteered for color band reading and habitat assessment of the endangered red-cockaded woodpecker (*Picoides borealis*) for FWC in central Florida.
- Volunteered for Alaska Department of Fish and Game doing a mark and recapture study of coho salmon (*Oncorhynchus kisutch*).
- Active bird watcher since 2008: North American and Hawaii Life List – 387, International Life List – 475, Total species on Life List – 862.

SNEI PROJECT EXPERIENCE

- ***VEA Stirling Mountain to Northwest Transmission Line*** – Project Lead/AB – Provide ESA Section 7 desert tortoise mitigation, responsible for coordinating with the agencies to ensure compliance with the B.O., overseeing compliance with protective stipulations for listed species, desert tortoise surveys and clearances, construction monitoring, desert tortoise worker education presentation, attend project meetings; Johnnie, NV to N. Las Vegas, NV (10/2010 – present).
- ***UNEV Pipeline*** –Project Lead/AB – Provide ESA Section 7 desert tortoise mitigation, responsible for coordinating with the agencies to ensure compliance with the B.O., overseeing compliance with protective stipulations for listed species, desert tortoise surveys and clearances, construction monitoring, desert tortoise worker education presentation, attend project meetings; St. George, UT to Apex, NV (12/2010 – present).
- ***Apex Reinforcing Area*** – Biologist II – Provide ESA Section 7 desert tortoise mitigation, conduct survey and clearance; Apex, NV (10/20/10).

SNEI USFWS PROJECT APPROVAL

- Stirling to Northwest project (File no. 1-5-07-F-456)
- UNEV Pipeline Project (File no. 84320-2011-TA-0351 and 6-UT-09-F-023)
- Kern River Gas Transmission Project (File no. 1-5-02-F-476)
- NV Energy (File nos. 1-96-F-023R and 1-5-97-F-251)
- Coyote Springs Investment (File nos. 1-5-93-F-067R and 1-5-05-FW-526)

John K. Konecny (760) 489-5276
1501 East Grand Avenue, # 2403 jkonecny@cox.net
Escondido, CA 92027

EXPERIENCE

Wildlife Biologist – Konecny Biological Services, Escondido, CA. April 1998 to Present
Contracted by various southern California consulting firms and clients. Conducted biological assessment, construction monitoring, and general biological surveys. Conducted focused surveys for the California gnatcatcher, least Bell's vireo, western yellow-billed cuckoo, Yuma and light-footed clapper rail, California black rail, Belding's Savannah sparrow, arroyo toad, desert tortoise, southwestern willow flycatcher, and Gila woodpecker. Conducted nest monitoring of the California least tern, western snowy plover, least Bell's vireo, light-footed clapper rail, and California gnatcatcher; construction monitoring for the arroyo toad, desert tortoise, least Bell's vireo, and California gnatcatcher; and brown-headed cowbird trapping. Participated in a two-year long general avifaunal survey of the Salton Sea, and have a featured chapter in Guide to the Birds of the Salton Sea (ISBN 1-886679-21-5). Research Associate for the Clapper Rail Study Team from 1998 to 2011, conducting the range-wide annual census, captive breeding program, banding, and radio telemetry for the light-footed clapper rail in southern California.

California Least Tern Biologist Seasonally from 1986 to 2001
On a seasonal basis, contracted by the California Department of Fish and Game, Port of Los Angeles, United States Navy, and Army Corps of Engineers, to monitor California least tern and western snowy plover nesting sites throughout San Diego County. Mapped nesting sites and collected data on colony size, clutch size, hatching and fledging success, and predator impacts. Banded and weighed chicks. Conducted tern foraging surveys at the Naval Submarine Base and Naval Amphibious Base in San Diego, Marine Corps Base Camp Pendleton, and Seal Beach Naval Weapons Station.

Fish and Wildlife Biologist – U.S. Fish and Wildlife Service, Carlsbad, CA. May 1992 to April 1998
Conducted ecological investigations of water and land development proposals including Corps of Engineers section 10/404 permit applications, and environmental impact reports and statements in western Riverside, San Bernardino, Orange, San Diego, and Los Angeles Counties. Conducted section 7 consultations and conferences, investigated unauthorized destruction of wetland habitat, and participated in multi-species planning. Familiarity with the California Environmental Quality Act, Endangered Species Act, Clean Water Act, Rivers and Harbors Act, Fish and Wildlife Coordination Act, and National Environmental Policy Act. Wrote objective reports and summaries, developed recommendations and alternatives for resource protection and enhancement. Investigated and determined habitat requirements and recovery needs for various wildlife species, including listed endangered and threatened species, candidate species for listing, and other species of special or local concern. Represented the Service at meetings with other Federal, State, and private interests, and presented and explained Service policies, positions, and recommendations.

Biologist – Ogden Environmental Services, San Diego, CA (formerly ERCE). April 1989 to May 1992
Conducted surveys and censuses of wildlife populations. Mapped vegetation communities, wildlife habitat, sensitive resources, and rare and endangered species. Determined potential impacts to sensitive resources and developed mitigation measures to offset these impacts. Performed habitat assessments using aerial photographs and topographic maps. Wrote technical reports and assisted senior staff with presentation and proposal preparation.

Field Biologist 1985 to 1992
Contracted on a part-time basis by various San Diego based environmental consulting firms including Westec Services, Michael Brandman Associates, Sweetwater Environmental Biologists, and SJM Biological Consultants. Responsibilities included vegetation surveys and mapping; general bird surveys; focused surveys for the California gnatcatcher, least Bell's vireo, and southwestern willow flycatcher; and least tern foraging surveys. Participated in the California Department of Fish and Game monitoring program for the least Bell's vireo population in San Diego and Riverside Counties, and maintained a trapping and monitoring program for brown-headed cowbirds. Prepared written summaries and suggested management practices incorporated into the following field season's methodology.

EDUCATION

Bachelor of Science Degree, Marine Biology, 1983, California State University Long Beach

CERTIFICATION

Small Business
California Small Business Certified (57302)
Professional Liability Insurance: $1,000,000 ($3,000,000 aggregate)
General Liability Insurance: $1,000,000 ($2,000,000 aggregate)
Vehicle Insurance: $1,000,000

Fish and Wildlife Service 10(a) Recovery Permit, TE837308-4 (expires October 1, 2012), and State of California Memorandum of Understanding (MOU): authorized to survey and handle the arroyo toad; survey, nest monitor, and band California least tern, western snowy plover, least Bell's vireo, southwestern willow flycatcher, California gnatcatcher; and survey for the Yuma clapper rail, light-footed clapper rail, California black rail, western yellow-billed cuckoo, elf owl, and Gila woodpecker throughout southern California, Arizona, and Nevada.

Mater Personal Bird Banding Permit, #22566, authorized for mist nets and auxiliary marking

Tracker - San Diego Tracking Team
Track and Sign Level I - CyberTracker Conservation

Desert Tortoise Surveying, Monitoring and Handling Techniques Workshop/Certification , 2008, 2000
Southwestern Willow Flycatcher Workshop, 2005, 1998
Mohave Ground Squirrel Workshop Certificate, 2005
Flat Tail Horned Lizard, BLM Certified to survey, handle, and relocate, 2001

Federal authorization letter and State of California MOU for brown-headed cowbird trapping and removal

PUBLICATIONS, TECHNICAL REPORTS, and PRESENTATIONS

Zembal, R., S. Hoffman, and J. Konecny. 2010. Status and Distribution of the Light-footed Clapper Rail in California 2010. Final Report to United States Fish and Wildlife Service, and California Department of Fish and Game. 17pp

Zembal, R., S. Hoffman, and J. Konecny. 2009. Status and Distribution of the Light-footed Clapper Rail in California 2009. Final Report to United States Fish and Wildlife Service, and California Department of Fish and Game. 17pp.

Zembal, R., S. Hoffman, and J. Konecny. 2008. Status and Distribution of the Light-footed Clapper Rail in California 2008. Final Report to United States Fish and Wildlife Service, and California Department of Fish and Game. 17pp.

Zembal, R., S. Hoffman, and J. Konecny. 2007. Status and Distribution of the Light-footed Clapper Rail in California 2007. Final Report to United States Fish and Wildlife Service, and California Department of Fish and Game. 17pp.

Zembal, R., S. Hoffman, and J. Konecny. 2006. Status and Distribution of the Light-footed Clapper Rail in California 2006. Final Report to United States Fish and Wildlife Service, and California Department of Fish and Game. 17pp.

Zembal, R., J. Konecny, and S. Hoffman. 2006. A Survey of the Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*) in California 2006. Final Report to California Department of Fish and Game. 15pp.

Zembal, R., S. Hoffman, and J. Konecny. 2005. Status and Distribution of the Light-footed Clapper Rail in California 2005. Final Report to Naval Base Point Mugu, United States Fish and Wildlife Service, and California Department of Fish and Game. 14pp.

Zembal, R., S. Hoffman, and J. Konecny. 2004. Light-footed Clapper Rail in California, Management, Study, and Translocation, 2004. Final Report to Naval Base Point Mugu, United States Fish and Wildlife Service, and California Department of Fish and Game. 30pp.

Konecny, J. and D. Stadtlander. 1995. Use of an Abandoned Dredge Rig as an Artificial Nesting Platform by Double-Crested Cormorants in San Diego County. Poster presented at the 22nd annual Pacific Seabird Group meeting, San Diego, California.

Konecny, J. 1995. A Summary of Colonial Seabirds and the Western Snowy Plover Nesting at Western Salt, South San Diego Bay, California, During 1994. Unpublished report prepared for the Fish and Wildlife Service Coastal Ecosystem Program.

Stadtlander, D., and J. Konecny. 1994. Avifauna of South San Diego Bay. 1994. Unpublished report prepared for the Fish and Wildlife Service Coastal Ecosystem Program.

Pavelka, M., and J. Konecny. 1992. Northward Migration of a Northern Harrier. Raptor Research 26: 196.

Mock, P., J. Konecny, and B.Jones. 1990. California Gnatcatcher Survey Guidelines. Guidelines prepared and adopted by the Fish and Wildlife Service.

Mock, P., J.Konecny, B. Jones, M. Grisahver, and D. King. 1990. Home Range and Habitat Preferences of the California Gnatcatcher in San Diego County. Paper presentation at the AOU and COS joint meeting. Los Angeles, California.

ORGANIZATIONS

American Ornithologists Union
Association of Field Ornithologists
Colonial Waterbird Society
Cooper Ornithological Society
Desert Tortoise Council
Pacific Seabird Group
Western Field Ornithologists

REFERENCES

References and verification of any factual statement presented herein available upon request.

Updated: 2010

GANDA

STEFANIE L. KRANTZ

Wildlife Biologist

EDUCATION

M.S.	Resource Ecology Management	University of Michigan, Ann Arbor	2005
B.S.	Biology	McMurry University, Abilene, TX	1997

PROFESSIONAL PROFILE

Ms. Krantz has over eleven years of experience as a wildlife biologist. She is an ecologist trained in the study and identification of birds, mammals, reptiles, amphibians, and insects. Since joining Garcia and Associates, she has monitored for endangered species and conducted desert tortoise surveys, desert botany surveys, and desert bird surveys. She is trained in the identification of wildlife and habitats in the Mojave and Sonoran deserts. She has experience conducting willow flycatcher, least Bell's vireo, burrowing owl, yellow-billed cuckoo, Swainson's hawk, peregrine falcon, giant garter snake, California red-legged frog, orange-throated whiptail, and Quino checkerspot butterfly surveys. Ms. Krantz is proficient with numerous field research techniques including conducting avian point counts, mist-netting and banding passerines, color band re-sighting, and territory mapping. She is an NABC-certified bird bander with excellent avian identification skills. She has conducted avian surveys in the desert and can identify species in the Mojave and Sonoran deserts by sight and sound. She also has experience conducting standardized protocol level desert tortoise surveys, small mammal trapping, invertebrate sampling, snake and amphibian surveys, GPS/GIS, and orienteering. She has excellent data management, quality control and analysis skills, and has prepared survey and biological reports, biological assessments, and published original ecological research.

PROFESSIONAL TRAINING

- Death Valley's Endemic Flora, Jepson Herbarium Workshop, Death Valley, CA (2012)
- Desert Tortoise Council Desert Tortoise Handling Workshop, Ridgecrest, CA (2009); Test Score: 91.47%.
- Southwest Willow Flycatcher Survey Training, Southern Sierra Research Institute (2009)
- American Red Cross Adult CPR and First Aid (2011)
- Introduction to Plant Morphology, Jepson Herbarium, Berkeley, CA (2011)
- Rare Pond Species Survey Techniques Workshop (California Red-Legged Frog, California Tiger Salamander, and Western Pond Turtle), Rohnert Park, CA (2010)
- Wetland Delineation and Management Training Course, Sacramento, CA (2008)
- NABC (North American Banding Council) Bird Bander Certification (2007)
- American Red Cross Wilderness First Aid, First Aid, and Adult CPR Training (2006)
- Department of Interior Motorboat Operator Certification Course (2006)
- Tracking & Nature Awareness Workshop, Consumnes River Preserve, Galt, CA (2005)

PROFESSIONAL EXPERIENCE

Garcia and Associates **Wildlife Biologist**
April 2008 – Present
Representative Projects:

- **Burrowing Owl Surveys (2012).** Conducted burrowing owl surveys for solar power project near Blythe, California. Recorded incidental species including desert tortoise, nesting raptors, birds, kit fox, badger, and Mojave fringed toed lizard.
- **Swainson's Hawk Surveys (2011, 2012**). Conducted protocol level surveys for Swainson's Hawk for linear transportation and transmission projects.
- **Western Area Power Administration Transmission Line Upgrade (2010-2011).** Conducted preconstruction surveys for burrowing owl, Swainson's hawk, and giant garter snake. Conducted monitoring for giant garter snake, and nesting bird surveys. Contributed text to Compliance Monitoring and Compliance Plan, Coordination and Communication Protocol, and wrote survey reports. Mapped features with Trimble GEO XT handheld unit. Saw 4 recently active burrowing owl burrows with scat, pellets, and feathers, and 18 active Swainson's hawk nests.
- **Desert Tortoise Monitoring, Tehachapi, CA (2010).** Conducted 28 hours (3 days) of pre-construction desert tortoise surveys and desert tortoise monitoring activities for a wind power project in the Mojave Desert at Alta Pass.
- **Desert Tortoise Surveys, Mojave Desert, Banning, CA (2010).** Conducted protocol level desert tortoise surveys in creosote scrub habitat in Mojave Desert for transmission line permitting (70 hours survey time with qualified biologist).
- **Desert Tortoise Surveys, Mojave Desert, Twenty-Nine Palms, CA (2009).** Conducted protocol level desert tortoise surveys in creosote scrub habitat in Mojave Desert for solar power plant installation (68 hours survey time with qualified biologist).
- **Desert Tortoise Surveys, Mojave Desert, Barstow, CA (2009).** Conducted protocol level desert tortoise pre-construction clearance surveys in creosote scrub habitat in the Mojave Desert for a solar power plant construction project (30 survey hours survey time with a qualified biologist).
- **Phase I & II Burrowing Owl Surveys, Central Valley, CA (2008).** Carried out phase II protocol level burrow surveys for the western burrowing owl within impacts areas within the 20 mile corridor for PG&E's Vaca Dixon-Peabody-Lambie-Birds Landing 230kV Reconductoring Project in Solano County. Also, carried out a phase I and II protocol level surveys for the western burrowing owl along a five mile long linear study area on private land for PG&E's Yolo to Roseville Pipeline Routing Study in the Dunnigan Hills area of Yolo County. Recorded burrow and BUOW locations when individuals and/or sign of habitation were present. Wrote and edited technical reports. Saw 2 adult burrowing owls, and 2 active burrows.
- **SDG&E Wood to Steel Pole replacement project, San Diego National Wildlife Refuge (2008).** Ensured compliance of construction activities and safety of endangered and threatened species including the least Bell's vireo, California gnatcatcher, orange-throated whiptail, San Diego rufous-crowned sparrow, and Quino checkerspot butterfly during a power pole replacement project. Observed two least Bell's vireo, 9 California gnatcatchers, 3 orange-throated whiptails, 1 San Diego rufous-crowned sparrow, and the host plants for Quino checkerspot butterflies on the project site.

PRBO Conservation Science **Field Research Assistant**
March – July 2007, November - January 2008

- **Cosco Busan Oil Spill in Marin County, CA.** Conducted beach surveys for oiled and non-oiled wildlife following oil spill. Captured and transported live oiled birds and collected carcasses. Volunteered to help clean seabirds at the International Bird Rescue and Recovery Center. Entered and proofed data.
- **Palomarin Long-Term Landbird Monitoring Program, Marin County, CA.** Extracted, banded, and processed over 600 birds. Banded nestlings, hummingbirds and small raptors and color-banded study species. Conducted avian and vegetation surveys. Mended nets and maintained banding kits, trails, and net lanes. Trained and supervised volunteers, and educated public and school groups about avian conservation.

USGS Colorado Plateau Research Station **Biological Science Technician**
May – November 2006

- **Yellow-Billed Cuckoo Monitoring Project, Southwestern AZ.** Conducted presence/absence surveys for yellow-billed cuckoos, and rigorous vegetation surveys in desert riparian and upland habitats from Bill Williams National Wildlife Refuge to the U.S./Mexico border on the Colorado River. Created data summary tables for report and wrote supporting text.

University of Nevada – Reno **Survey Crew Leader**
May – September 2005

- **Willow Flycatcher Project, Northern Sierra Nevada Mountains, CA.** Planned and supervised presence/absence surveys for willow flycatchers. Found and monitored nests of willow flycatchers, dusky flycatchers, and yellow warblers. Re-sighted color-bands and mapped territory boundaries. Trained and supervised field assistants. Trapped & identified insects. Collected data on vegetation structure.

Institute for Bird Populations **Field Research Assistant**
May – June 2004

- **Manter/McNally Fire Project, Sequoia National Forest, CA.** Conducted vegetation surveys and avian point counts in remote backcountry sites. Used dichotomous keys to identify plants in study area. Recorded observations of bird behavior and plant phenology. Utilized GPS, pacing, and orienteering to navigate to field sites and transects.

Florida State Dept. of Agriculture **Plant Pest Survey Coordinator**
October 2002 – April 2004

- **Cooperative Agricultural Pest Survey (CAPS), Div. of Plant Industry, Gainesville, FL.** Collaborated with a team to develop a new survey program that was deemed the best CAPS program in the United States, which became a model for other states. Managed surveys for exotic pests in agricultural, urban, and natural ecosystems. Collected plant and insect samples. Networked with researchers, extension agents, and farmers at university, state and federal agencies to implement cooperative surveys. Researched scientific literature for data on exotic arthropods and plant diseases. Assembled a database and field guide of exotic arthropods. Summarized data and wrote survey reports.

USGS Patuxent Wildlife Research Center **Volunteer Amphibian Surveyor**
March 2003 – April 2004

- **North American Amphibian Monitoring Program, Cedar Key and Otter Creek, FL.**

Participated in volunteer point count survey for frogs in Florida to determine distribution and diversity of frogs in Florida. Conducted unlimited radius point counts for frogs based on vocalizations.

Univ. of Florida, Department of Zoology **Field Research Assistant**
October 2002 – February 2003

- **Dispersal of Invasive Chinese Tallow Project, Paynes Prairie State Preserve, FL**. Conducted avian foraging observations and recorded seed dispersal events.

The Nature Conservancy **Wetland Research Assistant**
June 2002 – August 2002

- **Wetland Restoration Project, Disney Wilderness Preserve, Kissimmee, FL.** Completed photopoint monitoring survey of over 50 wetlands ahead of schedule. Worked with survey grade GPS equipment, palm top computers, cameras, data recorders and All Terrain Vehicles in wetlands. Followed strict contamination control procedures to avoid spreading invasive plants. Managed MS Access database and updated maps in ArcView. Assisted with canopy, shrub and herbaceous layer vegetation sampling. Assisted with Eastern Big-Eared Bat and Florida Scrub Jay monitoring**.**

Texas Tech University, Biology Dept. **Howard Hughes Tropical Ecology Fellow**
June 1996 – August 1996

- **Long-Term Ecological Research Program, Luquillo Experimental Forest, Puerto Rico.** Assisted with mark and recapture study of terrestrial mollusks. Navigated to survey points in the rainforest at night via map and compass. Collected samples for macro-invertebrate community ecology project. Sampled vegetation structure, canopy density and leaf litter characteristics.

PROFESSIONAL AFFILIATIONS

- The Wildlife Society
- Ecological Society of America
- Society for Conservation Biology
- Cornell Lab of Ornithology
- American Birding Association
- American Bird Conservancy
- American Ornithological Union
- Point Reyes Bird Observatory Conservation Science

PUBLICATIONS

- Krantz, S. L., Benoit, T. G. and Beasley, C. W. (1999) "Phytopathogenic Bacteria Associated with Tardigrada." *Zoologischer Anzeiger,* 238: 259-260. Presented at Seventh International Symposium on Tardigrada in Dusseldorf, Germany, September 4 -7, 1997.
- Vandermeer, J. H., B. Hoffman, S. L. Krantz-Ryan, U. Wijayratne, J. Buff and V. Franciscus. (2001) "Effect of Habitat Fragmentation on Gypsy Moth (*Lymantria dispar* L.) Dispersal: The Quality of the Matrix." American Midland Naturalist 145: 188-192.

TECHNICAL REPORTS

- Dixon, W., Krantz, S, Baruch, D., Ogle, Y. Westwood, C. "Lobate Lac Scale Survey, *Paratachardina lobata lobate*, in South Florida." Florida Cooperative Agricultural Pest Survey Report No. 2003-04-LLS-01. Florida Department of Agriculture and Consumer Services, Division of Plant Industry, PO Box 147100, Gainesville, FL 32614, April 2003.
- Krantz, S. "Monitoring Report for Peregrine Falcons at Devil's Promontory, San Mateo County, CA, Devil's Slide Improvement Project, EA 1123U3." State of California, Department of Transportation. June 25, 2008.
- Krantz, S. "Monitoring Report for Peregrine Falcons at Devil's Promontory, San Mateo County, CA, Devil's Slide Improvement Project, EA 1123U3." State of California, Department of Transportation. August 2009.
- Krantz, S. Identification of Resources, Potential Impacts, and Wetlands Sections of Environmental Protection Plans for Makua Military Training Area, Humuula Sheep Station, and Kulani Boys Home, Hawaii, USA. November 28, 2008.

PRESENTATIONS

- Krantz, S. Butterfly Diversity in Coffee Agroecosystems. Poster presented at Ecological Society of America Meeting, Pittsburg, PA, August, 2010.

RELEVANT QUALIFICATIONS

Years of Experience
>20

Education
B.S. 1986. Natural Resources Management, University of Maryland, College Park, Maryland.

Expertise
Raptors and Avian Predator Management

Publications

Collins, P. W., and B. C. Latta (In press). Food habits of nesting golden eagles (aquila chrysaetos) on Santa Cruz and Santa Rosa Islands, Santa Barbara County, California in Proceedings of the 7th California Islands Symposium, Oxnard, CA, February 5-7, 2008

Linthicum, J. L., R. E. Jackman, B. C. Latta, J Koshear, and M. Smith. 2007. Annual Migrations of Bald Eagles To and From California. Journal of Raptor Research, v.33 n.2: 106-112.

Latta, B. C., D. E. Driscoll, J. L. Linthicum, R. E. Jackman, and G. Doney. 2005. Capture and Translocation of Golden Eagles from the California Channel Islands to Mitigate Depredation of Endemic Island Foxes. Pp. 341-350. in Proceedings of the Sixth California Islands Symposium, Ventura, California, December 1-3, 2003. (D. K. Garcelon, and C. A. Schwemm, eds.). National Park Service Technical Publications CH15-05-01, Institute for Wildlife Studies, Arcata, CA.

Coonan, T. J., K. Rutz, D. K. Garcelon, B. C. Latta, M. M. Gray, and E. T. Aschehoug. 2005. Progress in Island Fox Recovery Efforts on the Northern Channel Islands. Pp. 263–274. in Proceedings of the Sixth California Islands Symposium, Ventura, California, December 1-3, 2003. (D. K. Garcelon, and C. A. Schwemm, eds.). National Park Service Technical Publications CH15-05-01, Institute for Wildlife Studies, Arcata, CA.

Latta, B. C. 2003. Too Many Peregrines? A North American Saga of Tenacity and Teamwork (T.J. Cade and W. Burnham eds.). The Peregrine Func, Boise, ID.

KEY QUALIFICATIONS

Mr. Latta has an in-depth understanding of state and federal regulations with regard to birds of prey and has a flexible and solution-oriented perspective on raptor issues. He is a Wildlife Biologist and published Raptor Specialist with over two decades of experience assisting clients with a variety of electrical transmission, power, telecommunications, transportation, and land use projects. Mr. Latta is recognized by both state and federal resource agencies as a leader in: avian predator management solutions; all phases of raptor capture, handling, nest monitoring, and relocation activities; captive raptor breeding; avian collision deterrence and avoidance techniques; and the application of telemetry devices to birds of prey. Since 2001, Mr. Latta has co-authored five publications that address critical issues associated with bald eagles, golden eagles, and peregrine falcon feeding and habitats; migrations; capture and translocation; survey; monitoring; and government recovery efforts. Mr. Latta supports projects throughout Los Angeles, Orange, San Diego, Riverside, Imperial, San Bernardino, Ventura, Santa Barbara, San Luis Obispo, Santa Cruz, Sacramento, Santa Cruz and Santa Rosa Islands in California

Wildlife Biologist

Altamont Wind Resource Area Avian Mortality Study

Mr. Latta was a principal investigator for the Alameda County Altamont Wind Resource Area Project. The activities of the avian research program at the National Renewable Energy Laboratory (NREL) focused on minimizing the effects of wind turbines on birds and bird populations. The study was funded by the U.S. Department of Energy to refine the methods developed to assess impacts on birds and bird populations within wind plants, to understand how birds behave in and around wind turbines in different environments, to identify how birds recognize wind turbines and develop recommendations for making the turbines more conspicuous, and to develop recommendations for reducing impacts when they do occur.

Wildlife Biologist

Daggett Ridge Wind Farm Project

Mr. Latta was a principal investigator for the Dagget Wind Farm Project's pre-sting raptor migration surveys. The Project is a proposed 82.5 megawatt wind energy generating facility on approximately 2,601.7 acres of Federal land in unincorporated San Bernardino County.

Wildlife Biologist

Soda Mountain Solar Project

Mr. Latta participated and supporting avian point count surveys for the proposed Soda Mountain Solar Project. The Soda Mountain Solar Project is a proposed 350 megawatt ("MW") solar electric power generating facility on federal lands managed by the U.S. Department of Interior, BLM, in San Bernardino County. The Project consists of roughly 7,000 acres, located approximately 5 miles southwest of Baker, California along Route I-15.

Wildlife Biologist

Schuyler Heim Bridge Replacement Project

Mr. Latta is supporting the Alameda Corridor Engineering Team and California Department of Transportation (Caltrans) efforts to temporarily relocate an active breeding pair of Peregrine Falcons. As a result, Mr. Latta is coordinating with resource agencies and implementing a project specific Take Avoidance and Peregrine Falcon relocation Plan which includes a framework for long term / adaptive management of Peregrines, details associated with biological monitoring, and contingency provisions. The Project is within the Cerritos Channel, within the Ports of Los Angeles and Long Beach.

Wildlife Biologist

Edwards AFB Bird-Aircraft Strike Project

Mr. Latta is participating with a team of other biologists to collect and report on migratory bird activity within ½ mi of the Edwards AFB main runway. The baseline data supports the further development of a comprehensive system for the identification and prediction of Bird-Aircraft Strike Hazards (BASH). Mr. Latta also preformed third party reviews of avian studies from 2000 to 2005 on bird count and raptor survey data. Mr. Latta is currently supporting seasonal, migration, breeding and wintering surveys at Edwards AFB.

Wildlife Biologist

Granite Wind Energy Generation Project

Mr. Latta was responsible for third party review of bird point count data (i.e., small bird and raptor Nest Surveys). The proposed Granite Wind Project is making an application for a right-of-way (ROW) grant for long-term commercial wind energy development from the BLM, Barstow District, California Field Office for the installation of a new wind energy generation facility and an application to San Bernardino County for a Conditional Use Permit for a commercial wind energy facility. The project will be located on lands administered by the BLM, as well as private lands. Additional responsibilities included agency coordination and development of mitigation packages in accordance with local, sate, and federal agency standards**.**

Wildlife Biologist

California Energy commission -PIEREA, Avian-Energy Systems Mitigation Program

Mr. Latta was a principal investigator for California Energy commission- Public Interest Energy Research Environmental Area (PIER-EA), Avian-Energy Systems Mitigation Program. Mr. Latta assisted staff to create and manage projects that developed and tested new methods and technologies to reduce avian interactions with utility structures. A technical advisory committee (consisting of agency, university, and industry members) also assisted and directed the research that Mr. Latta supported.

JEFFREY L. LINCER, Ph.D.
Senior Scientist and Consulting Ecologist

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(619) 668-0032 (Direct); jefflincer@gmail.com

EDUCATION

Post-Doctoral	Selby Environmental Fellow, 1972-74	Mote Marine Laboratory, Sarasota, FL
Ph.D.	Ecology and Systematics, Ecology "The Effects of Organochlorines on Raptors"	Cornell University, Ithaca, NY
Pre-Doctoral (36 cr. hrs.)	Inter-American Conferences on Toxicology and Occupational Medicine, 1968 and 1972	University of Miami, Miami, FL
M.S., M.F.	Wildlife Management, 1969	New York State College of Forestry & Envir. Science, Syracuse, NY
B.S., B.F.	Forest Zoology, 1967 (*cum laude*)	New York State College of Forestry & Envir. Science, Syracuse, NY

BIOGRAPHICAL SKETCH

Dr. Lincer has been involved in research projects from Alaska to Africa, has a strong interest in the natural resources of those areas as well as Florida, Southern California and Mexico, and has produced over 100 scientific publications and papers. Dr. Lincer has over 40 years (15 of which with local government) experience in the environmental field. He has taught numerous college-level biological, environmental, and toxicological classes and courses. He has a strong history of scientific involvement, complex natural resource project management, and environmental policy; and has successfully dealt with local, regional, state, and federal agencies and issues. He has directed or contributed to major projects from Alaska to Africa. He is a co-founder of, and past Research Director for, the non-profit Wildlife Research Institute, Inc.; currently holds an Adjunct Scientist position with the San Diego Museum of Natural History (Department of Birds and Mammals) and the Mote Marine Laboratory; has held adjunct positions at other well-known academic and research institutions; produced over 100 scientific publications and papers, authored scores of consultant reports, and served as advisor to high-level governmental offices and national/international conservation programs.

His background includes biological resource surveys and HCP monitoring for both public and private sectors, including local, county, regional, and federal government, and the development, mining and utilities industries, including wind and solar energy. He has technical expertise in ecotoxicology, terrestrial, coastal, desert, and wetland biology, endangered species, and habitat/watershed management. He has a particularly strong background in interdisciplinary project management, coordinating programs up to $5 million in size and commonly involving 10-12 subconsultants.

Since 1991, Dr. Lincer has managed and participated in natural resource surveys throughout southern California, including numerous ones in San Diego, Riverside, Imperial, San Bernardino, Kern, Los Angeles, and Orange counties. He served as program and project manager for many biological, ecotoxicological, and environmental projects. He has managed and/or conducted numerous NEPA/CEQA, CERCLA-related, and RCRA projects, many of which involving regional and watershed level resource considerations, wetland issues, and mitigation. He regularly works with T/E species and has extensive experience with the coastal California gnatcatcher, fish-eating birds, burrowing owl, golden eagle, and numerous other raptor species. He also has substantial experience with the brown pelican, various wading birds, least Bell's vireo, southwestern willow flycatcher, desert tortoise, arroyo toad, Quino checkerspot butterfly, steelhead trout, tidewater goby, bighorn sheep, Stephens' kangaroo rat, and San Joaquin kit fox.

Most recently, in Southern California, he has been the Project Manager and/or Lead Biologist for numerous biotechnical studies, including those for the private sector, utilities, the Corps of Engineers (Los Angeles District), U.S. Fish and Wildlife Service, CDFG, BLM, and California State Parks. He also has extensive experience managing and conducting fieldwork for various municipalities and on many military bases (i.e., San Clemente Island, MCB Camp Pendleton, Twentynine Palms, the former MCAS El Toro, March Air Force / Reserve Base, Camp Pendleton, and Edwards Air Force Base).

PROFESSIONAL EXPERIENCE

- Adjunct Research Scientist, San Diego Natural History Museum, Ornithology and Mammalogy Section, San Diego, CA (currently active).
- Adjunct Senior Scientist, Mote Marine Laboratory, an international marine research institution, Sarasota, FL (currently active)..
- Adjunct Associate Professor, University of Florida, School of Forest Resources and Conservation, Gainesville, FL.
- President and Chairman of the Board, Raptor Research Foundation, an international professional organization, made up of approximately 1,000 scientists representing over 40 countries. Currently Board Member and International Liaison.
- Scientific Advisor to a number of national and international environmental organizations, the (Florida) Governor's Office, 208, etc. water committees, school boards, local government, and AIBS Bioassay Standards Committee.
- President, Eco-Analysts, Inc., Sarasota, FL. Developed funded programs and carried out consulting activities relating to endangered species, environmental planning, FIFRA, the presence and effects of environ-mental toxicants; expert witness work; testing protocols; cancellation of registration hearings; TSCA, Data Evaluation Reports for EPA on pesticide registration applicants, etc.
- Scientific Advisor to local governments. Provided scientific guidance on phosphate mining, coastal zone management, energy and water conservation, critical habitat, endangered species, comprehensive planning, wild and scenic rivers, habitat acquisition and management.
- Director, Raptor Information Center, National Wildlife Federation, Washington, D.C. Developed and directed international program dealing with birds of prey, habitat acquisition and management, toxicants, etc. Interacted with numerous federal and state agencies.

- Senior Scientist and Program Director, Environmental Health and Estuarine Ecology Program, Mote Marine Laboratory, Sarasota, FL. Developed and funded environmental quality programs, including the establishment of the Pesticide Residue Laboratory.
- Technical Advisor, environmental conservation/education texts (K-12 and college level) and films (BBC and nationally syndicated).
- Board Member, Sarasota County Comprehensive Environmental Education Program (founding member); Gulf Coast Zoological Society (founding member and President); International Osprey Foundation (Technical Advisory Board); Centro de Estudios para la Conservacion de los Recursos (Chiapas, Mexico).
- Over 40 years referee work for several major scientific journals.
- Senior author for several major reviews of the scientific literature (e.g., estuararine environment; bald eagles; burrowing owls, including the world literature, and those focused on the California literature and owl territories).
- Associate Editor for Environmental Chemistry and Toxicology, Journal of Raptor Research.
- Team Leader for many interdisciplinary environmental studies and working bibliographies, including "The Effects of Synthetic Organic Compounds on Estuarine Ecosystems," which was published in EPA's Ecological Research Series.
- Developed mechanisms to protect wetlands and endangered species and established County-level Coastal Zone Management Division office. Sarasota County, FL
- Developed environmental quality programs, including the establishment of a pesticide residue laboratory, 1972-1974. Research aimed at elucidating the subacute effects of estuarine pollutants on marine invertebrates and fish-eating birds. Mote Marine Laboratory.
- Continued and expanded projects with an emphasis on the effects of land use changes and environmental pollution, 1974-76. Environmental Health and Estuarine Ecology Program, Mote Marine Laboratory, Sarasota, FL.
- In charge of pesticide residue analysis for various field and laboratory studies, 1969-72. Conducted field research on birds of prey. Cornell University.

EMPLOYMENT HISTORY

1997-2012.	Research Director/Cofounder	Wildlife Research Inst., Inc., Ramona, CA
1996-pres.	Principal	Lincer & Associates, San Diego, CA
1993-1996	Sr. Scientist in charge of Wildlife Biologists/Sr. Toxicologist	Sweetwater Environmental Biologists, Inc., San Diego, CA
1991-1993	Regional Manager/Sr. Ecologist/ Sr. Toxicologist	BioSystems Analysis, Inc., San Diego, CA
1972-1991	President/C.E.O. and Sr. Ecologist	Eco-Analysts, Inc., Sarasota, FL
1986	Taught "Environmental and Public Occupational Health"	University of South Florida College of Health, Tampa
1985-1991	Adjunct Associate Professor	University of Florida, Dept. of Wildlife and Range Sciences, Gainesville
1984	Taught "Environmental Science"	University of South Florida College of Education, Tampa
1977-1991	Scientific Advisor/Envir. Admin.	Sarasota County, FL
1976-pres.	Adjunct Senior Scientist	Mote Marine Laboratory, Sarasota, FL

1976-1977	Director, Raptor Information Center	Nat'l Wildlife Federation, Washington, D.C.
1974-1976	Senior Scientist/Director	Environmental Health and Estuarine Ecology Program, Mote Marine Lab., Sarasota, FL
1972-1974	Selby Environ. Research Fellow	Mote Marine Laboratory, Sarasota, FL
1969-1972	Research Assistant, Ecology and Systematics	Cornell University, Ithaca, NY
1967-1969	Research Assistant, Bioassays and Pesticide Residue Analyses	Syracuse University Research Corp., Microbiological and Biochemical Center

EXPERT WITNESS AND OTHER RELATED ACTIVITIES

- Testified as a witness for the Environmental Defense Fund (EDF) before the EPA Administrative Law Judge during the Aldrin-Dieldrin Cancellation of Registration Hearings. November 27, 1973. Washington, D.C. Subject: The effects of dieldrin on the behavior of the fiddler crab.
- Testified as a consultant expert witness for EPA during the Mirex Hearings. March 7, 1974. Washington, D.C. Subject: Review of the literature dealing with the effects of mirex on bird life.
- P.I. for Impact Assessment of Mosquito Larvicides on Selected Listed Species of Marsh and Shore Birds of the S.W. Florida Coast. Funded by Florida HRS and Lee County Mosquito Control District. July 1988-June 1990.
- Lincer, J.L. Prototypical Report: Avifauna and Man-made Systems. *In* Gasparilla Island: An Ecological Approach. E. Rifkin and F.S. Johns (Eds.). New College Environmental Studies Program. 1974.
- Lincer, J.L. The Effects of Synthetic Organic Compounds on Estuarine Ecosystems (A Semi-Popular Article). Prepared for the Environmental Protection Agency. November 1, 1974.
- Lincer, J.L. *In* Protocol for Testing Pesticides for Registration. Field-Testing Techniques. Prepared for A.I.B.S. Panel for Aquatic Toxicology. October 15, 1974.
- Lincer, J.L. Effects of Toxic Discharges on Aquatic Life. App. to D.R.I. Application for Jacaranda West. Gulfstream Land & Development Corp., Florida. January 1975.
- Testified as expert witness for the Sanibel-Captiva Conservation Foundation, Captiva, FL (v. Mariner Properties). February 20, 1979. Subject: Ecological value of grassflats and impact of proposed boat channel.
- Testified as expert witness for Rohm and Haas Co., Philadelphia, PA. Subject: The Reproductive Effects and Risks of Dicofol on Sensitive Bird Species. March 1987. Washington, D.C.
- P.I. for Environmental Assessment of Proposed Loading Dock and Barge Traffic on Area Bald Eagles, Maurice and Cohansey Rivers, New Jersey. May-November 1988.
- Presented review paper on "The Biology of the Myakka River" to the Myakka River Management Coordination Council. June 4, 1987. Sarasota, FL.
- Under contract to EPA, Washington, D.C. (Environmental Effects Branch) to provide review services on toxicology studies and the effects of various pesticides being considered for registration. July 1987-present.
- Lincer, J.L. The Potential Effects of the Proposed Caledon State Park on the Existing Bald Eagle and Osprey Populations. Prepared for Mr. James Nash, Agent for Cedar Grove Farms. January 1, 1975.
- Lincer. J.L. First and Second Follow-up Studies on the Bald Eagles and Ospreys of Cedar Grove Farms. Prepared for Mr. James Nash, Agent. September 1975 and August 1976.

- Provided input to President's Council on Environmental Quality (CEQ) on scoring and scoring procedure of environmental chemicals being considered under the Toxic Substance Control Act (TSCA), 1978 and 1979.
- Lincer, J.L. and N. Jaffee. The Bald Eagles of Cedar Grove Farms: Five Years in Review. Prepared for Mr. James Nash, Agent. October 22, 1979.
- Testified as expert witness for Sarasota County, FL (v. Estech Chemical Corp.) in DOA Hearing. Subject: Environmental impact of proposed Duette Mine. June 22-July 10, 1981.
- Lincer, J.L. An Environmental Critique of the Proposed Martin County Comprehensive Plan. Prepared for the Martin County Board of County Commissioners. November 23, 1981.
- Provided assessment of proper management of New Jersey's only bald eagle nest site. Client: Pitney, Hordin, Kipp and Smith. Morristown, NJ. June 1984.
- P.I. for Myakka River Basin Project. Funded by Florida DER/NOAA and included water quality, flow, GIS and biological (invertebrates and vegetation) investigations. October 1988.
- Prepared "Impact of Genstar's Proposed Maurice River (New Jersey) Dock-Loading Facility and Associated Barge Traffic on the Area Bald Eagles" for Genstar Stone Products Co., MD. 1988.
- Prepared "Impact of Genstar's Proposed Cohansey River (New Jersey) Dock-Loading Facility and Associated Barge Traffic on the Area Bald Eagles" for Genstar Stone Products Co., MD. 1988.
- Chairman, Sarasota Bay Project TAC. Multidisciplinary project which is part of the National Estuarine Program, administered by the USEPA. 1989 and 1990.

PROFESSIONAL AFFILIATIONS (*= currently active)

- San Diego Fire Recovery Network-Founding Member and Co-chair of Research and Monitoring Committee*
- American Ornithological Union*
- Association of Environmental Professionals
- ASTM
    - Pesticide Subcommittee Member
    - Animal Damage Control Committee
- Ecological Society of America
    - Nominated to Board of Professional Certification
- Florida Academy of Sciences
- Gulf Coast Zoological Society
    - Founding Board Member and Past President
- Raptor Research Foundation*
    - Secretary and Foreign Correspondent (1979-1981)
    - President (1982-1988)
    - Conference Guidelines Committee (ongoing)
    - International Communications Committee (ongoing)
    - Chair, Leslie Brown Award Committee, for research on African raptors (ongoing)
- Society of Environmental Toxicology and Contamination
- Society for Conservation Biology
- Sigma XI (currently serving on Executive Committee)*
- Society of Wetland Scientists
- The Wildlife Society (National)*

- The Wildlife Society (Florida Chapter)
    - Education Information Committee (1987-1991)
- The Wildlife Society (Western Section)*
    - Nominated for President (1992)
- The Wildlife Society (Southern California Chapter)*
    - President (1994-1997)
    - Chapter Representative to Western Section (2009-Pres.)

SAMPLES OF RELEVANT PUBLICATIONS

Lincer, J.L. and D.B. Peakall. 1970. Induced hepatic steroid metabolism and increased cytoplasmic RNA by polychlorinated biphenyls (PCB) in the American kestrel (*Falco sparverius*). Nature, 228 (5273):783.

Lincer, J.L., T.J. Cade and J.M. Devine. 1970. Organochlorine residues in Alaskan peregrine falcons, rough-legged hawks and their prey species. Can. Field Nat., 84(3):225-263.

Cade, T.J., J.L. Lincer, C.M. White, D.G. Roseneau and L.G. Swartz. 1971. DDE residues and eggshell changes in Alaskan falcons and hawks. Science, 172:955-957.

Lincer, J.L. and D. Zalkind. 1973. A preliminary note on organochlorine residues in the eggs of fish-eating birds of the west coast of Florida. Fla. Field Naturalist, Vol. 1(2):3-6.

Peakall, D.B., J.L. Lincer, R.W. Risebrough, J.B. Pritchard and W.B. Kinter. 1973. DDE-induced eggshell thinning: Structural and physiological effects in three species. Comp. Gen. Pharmac., 4:305-313.

Snyder, N.F.R., H.A. Snyder, J.L. Lincer and R.T. Reynolds. 1973. Organochlorines, heavy metals and the biology of North American accipiters. BioScience, 23(5):300-305.

Lincer, J.L. and J.A. Sherburne. 1974. Organochlorines in kestrel prey: A north-south dichotomy. J. Wildl. Mgmt., 38(3):427-434.

Lincer, J.L. and B. McDuffie. 1974. Heavy metal residues in the eggs of wild American kestrels (*Falco sparverius Linn.*). Bull. Environ. Contam. Toxicol., 12(2):227-232.

Lincer, J.L. 1975. The effects of dietary DDE on eggshell-thinning in the American kestrel: A comparison of the field situation and laboratory results. J. Appl. Ecol., 12(3):781-793.

Lincer, J.L. 1976. "The Raptor Information Center." Presented at the First Southern Bald Eagle Conference, December 10-12, Altamonte Springs, FL.

Lincer, J.L. 1976. "The Federation's Raptor Information Center." Presented at the 41st Annual Meeting of the National Wildlife Federation, March 25-27, Washington, D.C.

Lincer, J.L. and R. Clark. 1978. Organochlorine Residues In Raptor Eggs in the Cayuga Lake Basin. New York Fish and Game Journal, 25(2):121-128.

Lincer, J.L., W.S. Clark and M. Le Franc. 1979. Working Bibliography of the Bald Eagle. A comprehensive guide to the literature on the bald eagle. 2,000 refs. 268 pages with permuted keyword sort for index. National Wildlife Federation, Washington, D.C.

Lincer, J.L. 1981. "A Raptor Roadside Census in Southwest Florida." Presented at the Annual Meeting of the Florida Ornithological Society, October 17.

Lincer, J.L., D. Salkind, L.H. Brown and J. Hopcraft. 1981. Organochlorine Residues in Kenya's Rift Valley Lakes. J. Applied Ecology, 18(1):157-172.

Lincer. J.L. 1981. "Bald Eagle Management at the Local Government Level." Paper presented at the 45th Annual Meeting of the Florida Academy of Sciences, April 30-May 2, Orlando, FL. Florida Scientist, 44 (1):36-37.

Lincer, J.L. 1981. "Bald Eagle Management in the Southeastern United States." Paper presented at the International Bald Eagle/Osprey Symposium, October 28-29, Montreal, Canada.

Lincer, J.L. 1982. "Bald Eagle: Symbol of Symbols." Invited editorial for ENFO Newsletter (a publication of the Florida Conservation Foundation), Vol. 82, No. 3. Winter Park, FL.

Lincer, J.L. 1982. "Protecting Endangered Species at the Local Governmental Level." Paper presented at the 46th Annual Meeting of the Florida Academy of Sciences, April 22-24, DeLand, FL. Florida Scientist, 45(1):40.

Lincer, J.L. 1983. About the Raptor Research Foundation. The EYAS, Vol. 6(2), Fall.

Lincer, J.L. 1983. "But Release Them to Where?" Raptor Research & Rehabilitation Program Newsletter, 4-(Winter). 1982-83:6-8.

Lincer, J.L. 1983. End of the Year (Almost) Report for the Raptor Research Foundation, Inc. The EYAS, Vol. 6(3), Winter.

Snelling, J.C., A.C. Kemp and J.L. Lincer. 1983. "Organochlorine Residues in Southern African Raptor Eggs." Presented at the Second Conference on African Predatory Birds, August 22-25, Golden Gate National Park, South Africa.

Lincer, J.L. and S.N. Wiemeyer. 1983. "The Use of Kestrels in Toxicology." Presented by J.L. Lincer at the International Ancestral Kestrel Symposium, December 1, St. Louis, MO.

Lincer, J.L. 1984. The Priority of Proper Habitat Management. The EYAS (a newsletter of the National Wildlife Federation's Raptor Information Center), Vol. 7.

Wiemeyer, S.N. and J.L. Lincer. 1986. The Use of Kestrels in Toxicology. *In* "The Ancestral Kestrel." Bird, D. and R. Bowman (Eds.). Allen Press, Inc. Lawrence, KS.

Fyfe, R., R.W. Risebrough, J.G. Monk, W.M. Jarman, D.W. Anderson, L.F. Kiff, J.L. Lincer, I.C.T. Nisbet, W. Walker II, and B.J. Walton. 1987. DDE, Productivity and Eggshell Thickness Relationships Within the Genus Falco. Chapter 33 *In* Peregrine Falcon Populations: Their Management and Recovery. Edited by T. Cade, J. Enderson, C. Thelander, C. White. Published by the Peregrine Fund, Inc.

Lincer, J.L. (Team Leader/Report Compiler), A.Y. Blumberg, M.R. Dicks, R.O. Drummond and P. Teel. 1987. Environmental Assessment: Pilot Eradication Project (on Antigua, West Indies) Proposed for the Tropical Bont Tick (*Amblyomma variegatum*). Prepared for U.S. Agency for International Development. Consortium for International Co-op Protection. College Park, MD. 73 pp. + Apps.

Lincer, J.L. (Technical Editor). 1987. Florida Environmental Teacher's Resource Book. HBJ SCIENCE. Grades 1, 2 and 3. Harcourt Brace Jovanovich, Publishers. Orlando, FL.

Lincer, J.L. (Technical Editor). 1987. Florida Environmental Teacher's Resource Book. HBJ SCIENCE. Grades 4, 5 and 6. Harcourt Brace Jovanovich, Publishers. Orlando, FL.

Lincer, J.L. 1988. *In* Estuarine Pollution Control and Assessment: Proceedings of a Conference. U.S. Environmental Protection Agency, Office of Water Planning and Standards, Washington, D.C. pp. 425-443.

Lincer, J.L. 1988. Invited Book Review: Hawks, by W.S. Clark and B.K. Wheeler. Houghton Mifflin Co., Boston. 1987. 200 pp. Journal of Raptor Research, 21(3/4).

Lincer, J.L., B. Millsap and G. Holder. 1988. "Bald Eagle Buffer Zones: Do They Work in Florida?" Presented at Raptor Research Foundation Annual Meeting, October 26-29, Minneapolis, MN.

Lincer, J.L. (Consulting Editor). 1989. Raptor Habitat Management Under the U.S. Bureau of Land Management Multiple-Use Mandate by R.R. Olendorff *et al*. Raptor Research Report No. 8, Raptor Research Foundation, Inc. Allen Press. 80 pp.

Lincer, J.L., R.G. Brooks and B.L. Valla. 1991. "Managing Bald Eagles at the Local Level: A Prototypical Ordinance." Presented by J.L. Lincer at the Raptor Research Foundation Conference, November 6-9, Tulsa, OK.

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Lincer, J.L. and P.H. Bloom. 2003. Status of Burrowing Owls (*Athene cunicularia*) in San Diego County, California. Presented by JLL at the California Burrowing Owl Symposium. Western Section of The Wildlife Society and Albion Environmental, Inc. November 11-12, 2003.

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Lincer, J. L. and D.H. Johnson. 2012. Protocols used to survey for the burrowing owl (*Athene cunicularia*). Presented at the Society of Rangeland Management Annual Conference. 30 January; Spokane, WA.

Catherine MacGregor

Staff Biologist and Botanist

Areas of Expertise

Wildlife Surveys
Spring and Rare Plant Surveys
Habitat Mapping
Restoration Monitoring
Biological Technical Report Writing
Wetland Delineation
Native Plant Landscape Design

Years of Experience

With URS: 1 Year
With Other Firms: 10 Years

Education

BA, Biological Sciences with High Honors and Phi Beta Kappa, Smith College, 2006

Overview

In Ms. MacGregor's more than nine years of biological work in Southern California, she has gained valuable experience in conducting wildlife, habitat, and botanical surveys, as well as monitoring and report writing. Her avian survey experience includes coastal California gnatcatcher, least Bell's vireo, and burrowing owl protocol surveys; Gila woodpecker, nesting bird, and point count surveys; and general avian/wildlife surveys.

Avian and Wildlife Experience

Confidential Client Gila Woodpecker Survey, Riverside County, CA. Participated in spring 2012 Gila woodpecker surveys for a large-scale project in the eastern Riverside County; also documented all other incidentally observed bird species and sensitive wildlife.

Confidential Client Migratory Bird Point Count, Riverside County, CA. Assisted with the spring 2012 migratory bird point count surveys for a large-scale project in the eastern Riverside County desert by documenting all observed bird species.

Confidential Client Burrowing Owl Survey, Riverside County, CA. Participated in the 2012 burrowing owl burrow survey for a large-scale project in the eastern Riverside County desert according to the March 2012 survey guidelines.

Otay Mesa Burrowing Owl Survey, San Diego County, CA. Conducted protocol burrowing owl surveys at an occupied site along the U.S.-Mexico border on Otay Mesa in southwestern San Diego County.

Campus Park Residential Development and Biological Open Space, San Diego County, CA. Participated in a protocol least Bell's vireo presence/absence survey, habitat mapping, wildlife surveys, and spring and rare plant surveys for this 502-acre site in the Pala-Fallbrook area.

SDG&E Wood to Steel nesting bird surveys and nest monitoring, San Diego County, CA. As part of construction monitoring for the San Diego Gas and Electric Wood to Steel project, performed nesting bird surveys in the 2011 spring season, and monitored active nests in or near work areas.

Highlands Ranch Residential Development and Biological Open Space, San Diego County, CA. As lead biologist for this 177-acre site, participated in California gnatcatcher surveys, performed avian/wildlife surveys, performed spring and rare plant surveys, and prepared several iterations of a biological technical report for the proposed residential development and biological open space.

Singing Hills Residential Development and Biological Open Space, San Diego County, CA. As lead biologist for this 952-acre site, participated in California gnatcatcher surveys, performed avian/wildlife surveys, performed spring and rare plant surveys, and prepared the biological technical report.

Viejas Hills Estates Residential Development and Biological Open Space, San Diego County, CA. Mapped habitats, performed avian/wildlife surveys, performed spring and rare plant surveys, and conducted spring and rare plant surveys at this 182-acre site, and prepared several iterations of the biological technical report and open space management plan.

Lively Project, City of Poway, CA. Mapped habitats, performed avian/wildlife surveys, performed spring and rare plants surveys, and prepared the biological technical report and upland habitat revegetation plan for this 145-acre proposed residential development.

Montecito Ranch Residential Development and Biological Open Space, San Diego County, CA. Performed avian/wildlife surveys, and spring and rare plant surveys for this 935-acre project in the town of Ramona.

Pala Mesa Resort Major Use Permit and Biological Open Space, San Diego County, CA. As lead biologist, conducted habitat mapping, performed avian/wildlife surveys, performed spring and rare plant surveys, and prepared several iterations of the biological technical report.

Sevilla Residential Development, City of San Diego, CA. Performed habitat mapping, avian/wildlife surveys, spring and rare plant surveys, and a vernal pool survey and assessment for this site on the western edge of Otay Mesa.

Meyers Project, City of Escondido, San Diego County, CA. Peformed habitat mapping, avian/wildlife surveys, plant surveys, and delineation of a seasonal wetland for the proposed development.

Habitat Restoration and Management

Market Creek Plaza riparian habitat restoration, City of San Diego, CA. Managed this project on Chollas Creek in with qualitative and quantitative monitoring, including bird and wildlife monitoring and preparation of annual monitoring reports.

Hidden Meadows riparian habitat restoration project, San Diego County, CA. Performed qualitative and quantitative monitoring of this riparian habitat restoration project near the City of San Marcos.

Private residence riparian habitat restoration project, City of Poway, CA. Performed qualitative and quantitative monitoring of this riparian

habitat restoration project on a residential site and directed remedial measures as needed.

Old Coach Road riparian habitat restoration, City of Poway, CA. Performed qualitative and quantitative monitoring of this riparian restoration project adjacent to Old Coach Road in the City of Poway and directed remedial measures as needed.

Specialized Training

2011, 2012 Unexploded Ordnance Training
2007 San Diego Stream Team Bioassessment Professional Training
2006 San Diego Vernal Pool Flora and Habitat Restoration Workshop
2004 Fire Ecology of Chaparral and Coastal Sage Scrub Workshop
2002 San Diego's Sensitive Butterflies Workshop
2001 SERCAL Restoration and Revegetation Workshop
2001 Southwestern Willow Flycatcher Workshop
1999 U.S. Army Corps Wetland Delineation Training

Publications

"Land Cover Effects on Inorganic Nutrients in Groundwater and the Role of Salt Marshes in Interception of Land-Derived Nutrients Entering Estuaries of Waquoit Bay, Massachusetts." Biological Bulletin, 189: 248-249, 1995.

The Sea-Strand Vegetation of Lower Cape Cod, Massachusetts. Smith College (Honors Thesis): Northampton, MA, 1996

Chronology

02/12-present: URS, San Diego, CA
04/11-02/12: Aerotek, San Diego, CA
04/09-09/09: Consulting Botanist and Biologist, San Diego, CA
08/08-04/10: Volunteer Botanist, La Jolla Band of Luiseno Indians, Pauma Valley, CA
04/07-07/07: Aspen Environmental Group, Carlsbad, CA
03/01-11/06: REC Consultants, San Diego, CA
12/00-03/01: HDR Inc., San Diego, CA
03/99-10/00: EMD Inc., Orlando, FL

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RELEVANT QUALIFICATIONS

Years of Experience
30

Education
BS, San Diego State University
MS, San Diego State University

Expertise
Focused Avian Surveys, Point Count, Avian Habitat Assessments, Avian Monitoring

KEY QUALIFICATIONS

Mr. Clark Mahrdt is a published scientist with over 30 years of professional experience. Clark is an expert in the identification of North American species of birds by both sight and sound. Mr. Mahrdt is also affiliated with the National Audubon Society, and a two term member of their Board of Directors in Southern California. Mr. Mahrdt is experienced in the utilization of a variety of scientific avian survey methods, including transect, point counts, and area searches. Mr. Mahrdt also worked for almost half a decade with the San Diego Natural History Museum for the Department Of Birds and Mammals.

Biologist

San Dieguito River Park Joint Powers Authority

Mr. Mahrdt conducted field surveys to determine species diversity and abundance for raptors, passerines, amphibians, and reptiles at East Gorge Lake Hodges. Mr. Mahrdt also performed focused surveys for California Gnatcatcher and Cactus Wren.

Biologist

San Diego Gas and Electric Rose Canyon Reconductor Project

Mr. Mahrdt performed nest searches and monitored raptors and passerines for San Diego Gas and Electric to facilitate the replacement of deteriorating wooden poles with new steel poles, conductors and insulators. The work was done in the City of San Diego on the east side of Rose Canyon Open Space Preserve.

Biologist

Sunrise Powerlink Project

Mr. Mahrdt was responsible for data collection and pre-construction clearances surveys for raptors and passerines in the In-Ko-Pah Mountains, Imperial County, CA.

Biologist

Marine Corps Base Camp Pendleton Remediation Program

Mr. Mahrdt served as an avian specialist and biological monitor for numerous remediation sites on the installation. Sensitive species surveys included the raptors, California Gnatcatcher (*Polioptila californica*), and Least Bell's Vireo (*Vireo bellii pusillus*).

Publications

Mahrdt, C.R. and R.L. Barber. 1998. Bountiful Boden. Wrenderings, (Spring issue):4-5.

Barber, D, C. Mahrdt, K. Weaver, E. Hall, and P. Bergford. 1999 (revised). Birds of Lake Hodges, San Diego County, California: Checklist. Palomar Audubon Society.

Mahrdt, C.R. and Ed Hall. 1999. First summer record of the Winter Wren in San Diego County. Wrenderings, (Fall issue):3.

Lovich, R. E., C.R. Mahrdt, and B. Downer. 2005. Geographic distribution. *Actinemys marmorata* (Pacific Pond Turtle). Herpetological Review 36(2):200-201.

Goldberg, S. and C. Mahrdt. 2010. Reproduction in the Baja California Collared Lizard, *Crotaphytus vestigium* (Squamata: Crotaphytidae). Bull. Southern California Acad. Sci. 109(3):153-156.

Goldberg, S. and C. Mahrdt. 2011. Coluber (=*Masticophis*) fuliginosus (Baja California Coachwhip). Reproduction. Herpetol. Rev. 42(3):437-438.

Goldberg, S. and C. Mahrdt. 2011. Reproduction in the Great Basin Collared Lizard, *Crotaphytus bicinctores* (Squamata:Crotaphytidae). Bull. Southern California Acad. Sci. 110(3):189-192.

References

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Department of Earth and Biological Sciences
Loma Linda University
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Zachary Ormsby

726 Tehama Dr. South Lake Tahoe, CA. 96150

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PROFILE

As an Ethno-Biologist, I focus on the behavior patterns of apex predators and birds-of-prey, including migration, settlement, and sustainability. I have received one-on-one mentoring from Dr. Amadeo Rea in Ornithology and Desert Ecosystems, specimen training from Philip Unitt, and vast raptor work with Dave Bittner and Dr. Jeff Lincer, in field, lab, and museum environments. Extensive field time monitoring Golden Eagles for a long-term project has garnered me comprehensive understanding of nest behavior, juvenile age identification and handling of Golden Eagles, applicable for banding, wing tags, and GPS tracking. Intimate exposure to eagles during all life-stages has enabled me to field identify several raptors species from great distances with confidence and certainty. I have conducted numerous transect surveys and acoustic monitoring for Spotted Owl, Goshawk, and Peregrine Falcon. I am detail oriented, analytical, and pragmatic with a positive attitude and commitment to following protocol. I come well equipped with appropriate field gear, experience, and commitment for long days collecting accurate data in the field, safely. I contribute well within a team atmosphere or autonomously.

EDUCATION

University of San Diego. San Diego, CA.
B.A. *Ethno-Biology.*

* *Mentored by Ornithologist, Dr. Amadeo Rea.*
* *Voucher specimen training with Phil Unitt.*
* *3-day workshop with Jane Goodall.*
* *Built Native Garden on campus used as learning resource.*

San Diego Mesa College. San Diego, CA.
A.A. *Transfer Studies.* Emphasis, *Real Estate.*

*****Honored by school President during Graduation Ceremony for outstanding personal and academic achievement.*

RELEVANT COURSEWORK

Bio 100 Environmental Biology Lab: Desert Ecosystems. Dr. James Hannan
Anth 352 Ethnobiology: Riparian Habitat and Bird Life in Desert Ecosystems. Dr. Amadeo Rea.
Ethn 494 Indian Perspective: Cognitive Structuring of Folk Ornithology. Dr. Amadeo Rea.
Anth 323 SW Indian Cultures: Adaptive Hunting Strategies, Birds and Man. Dr. Amadeo Rea.
Anth 353 SW Plants and Animals: Identification and Specimen Collection. Dr. Amadeo Rea.

EXPERIENCE

FIELD BIOLOGIST URS; Blythe, Ca. **3/26/12-4/10/12**

100% Survey for Burrowing Owls, Golden Eagle, Peregrine Falcon, Prairie Falcon, Kit Fox, Desert Tortoise, Mojave Fringe-toed Lizard, Archaeological/Historical/Military artifacts.

- ***Burrowing Owl location and burrow identification via 5 person teams.***
- ***Transect surveys with advanced GPS use documenting environment conditions, habitat, and encountered species, based on established protocols.***
- ***12 days of walking desert terrain in 90º+ temps. Only team member in good physical shape upon project completion.***
- ***Team authority on confirming Burrowing Owl evidence beyond suitable habitat. i.e. feathers, white wash, pellets.***
- ***Team lead for Raptor identification, including Red-tailed color morphs and migrating Swainson's Hawks.***

RESEARCH ASSISTANT Great Basin Institute; Lake Tahoe, CA. **6/7/11-10/7/11**

50% Wildlife Education (Supervisors Office and Taylor Creek Visitors Center), 30% Field Science, 20% Visitor Assistance.

- ***Transect surveys and acoustic monitoring for Spotted Owl, Goshawk, Peregrine Falcon.***
- ***Provided field interpretation, and birding techniques at Bald Eagle nesting locations.***
- ***Updated visitors on birding locations, wildflower blooms, mushroom foraging areas.***
- ***Sponsored to receive CRAM training and earned best grade in class.***
- ***Conducted wildlife workshops for local students.***

FIELD SCIENTIST Wildlife Research Institute (WRI); Ramona, CA. **4/1/03-4/30/09**

70% Monitor Eagle population, 20% Track and monitor various species, 10% Care for wildlife.

- ***Long-term monitor of Golden Eagle population including nesting birds, juveniles, and floaters, utilizing field observation, GPS tracking, and radio telemetry.***
- ***Monitored and cared for Eaglets raised from a hack house.***
- ***Assisted with wing-banding and tracking dispersal of fledglings.***
- ***Performed carcass recovery efforts.***
- ***Assisted with habitat construction, monitoring, and care for Burrowing Owls.***
- ***Tracked and Surveyed Endangered/Threatened Species within the Coachella Valley. Documented interaction, and mortality rates with man influenced environment .*** **(***temps of 100º+. Species: Birds-of-Prey, Vultures, Big Horned Sheep, Mule Deer, Kit Fox, Coyote, Badger)*

VOLUNTEER California State Parks.
100% Collect data and monitor natural resources. Projects include: Spotted Owl and Long-Eared Owl surveys, Osprey and Bald Eagle nest checks, grant reviews/edits, and invertebrate stream sampling.

VOLUNTEER Tahoe Institute for Natural Sciences; Lake Tahoe, CA.
100% Participate in Bald Eagle point counts, and provide high-quality photography of flora and fauna for educational projects.

CERTIFICATIONS

Mammal Tracking	Wetland Monitoring	First Aid/CPR

SKILLS

I am highly attuned to desert ecosystems and have detailed experience surveying birds-of-prey, discerning the plumage variations of several species, and locating nesting/roosting sites. I can age juvenile Golden Eagles from considerable distance and have raised eaglets from hack house. I have detailed backcountry experience as a minimalist and with a full work station, for both short and extended periods of time. Capable of walking 20 miles per day with a 50 lb. pack, or sitting in a blind for extended periods. I am comfortable with off-road travel, navigating via map, compass, and/or GPS, and have the necessary equipment for extended periods in isolated locales. Collecting data in harsh desert conditions is where I excel, and I have the training, skill, and experience necessary to get the job done safely, on-time, with-in budget, and, according to protocol.

REFERENCES

Dr. Jim Hannan. Biologist. (858) 248-0929. jameshannan2003@yahoo.com

Dr. Jeff Lincer. Raptor Ecologist. (619) 337-4060. jefflincer@gmail.com

Nathan Shasha. Hydrologist. (530) 318-4685. n_shasha@hotmail.com

RENÉE OWENS

Wildlife / Conservation Biologist
9712 Snow View Drive, El Cajon, CA 92021
cell (619) 201-1965
office / fax (619) 447-4979
renee@wildlifezone.net

- CEQA, NEPA Biological / Environmental Assessments
- California gnatcatcher, Least Bell's vireo USFWS nest monitoring permits
- Protocol surveys for Arroyo toad, Burrowing owl, Cactus wren, Flat-tailed horned lizard, Desert tortoise, SW pond turtle
- Integrated Natural Resources Management Plans
- International research in wetland /endangered species conservation funded by National Geographic Grants
- Biological Evaluation, Assessment and Mitigation Monitoring
- Species Recovery Plan Research & Monitoring
- CEQA/ NEPA workshop instruction
- Mitigation and Construction Monitoring and Analysis
- Habitat Restoration Planning
- Rare plant, raptor migration, and MBTA nesting bird surveys
- Development & Instruction of Wildlife Conservation Certification Training course
- Point counts, Mist-netting, banding, radio telemetry, quadrat sampling, mark & recapture, pit-fall trapping,

Ms. Owens has 24 years experience as a wildlife ecologist, college instructor, and conservation biologist. She is founder and senior biologist of Owens Wildlife Biology, an ecological consultancy specializing in terrestrial and marine wildlife biology, established in 1993. Her extensive experience includes projects in California and Latin America with focus on terrestrial ecology, natural history, conservation management, restoration and mitigation monitoring and implementation.

Her consultancy provides services for a broad spectrum of projects which typically include one or more of the following: ecological and conservation research, biological / environmental assessments and reports, restoration implementation, surveys, mapping, and monitoring of threatened, sensitive, and endangered species. Projects address compliance with regulations from the local to federal level (e.g. the ESA, CEQA, NEPA, NCCP, Clean Water Act, MBTA, among others), and often support regional habitat conservation plans. Over the years her clients have included private and public entities as well as government agencies from the City to Federal level, and she is on the City of San Diego approved list of biologists.

Her project experience comprises a broad range of species and taxa (e.g. passerines, raptors, shorebirds, herptiles, cetaceans, pinnipeds, and carnivores); habitat experience includes riparian, oak and conifer woodland, desert scrub, sage scrub, chaparral, and various tropical communities. She also organizes an annual workshop teaching CEQA and NEPA review as it relates to wildlife.

Ms. Owens has been a college instructor in Biology, Ecology, Botany, and Environmental Science in California and Ecuador, and her conservation research has been featured by National Geographic TV and magazine, Discovery, BBC, Dateline NBC, Sierra magazine, among others.

Resume Renée Y. Owens 619-201-1965 renee@wildlifezone.net

EDUCATION

Community College Instructor Certification, University of California San Diego Extension

Advanced Statistical Coursework and Ecology Seminar, University of Tennessee, Knoxville

MS in Ecology and Evolutionary Biology, San Diego State University

BS in Biology, Minor in Environmental Studies, SUNY Geneseo

REGISTRATION / CERTIFICATIONS

- Desert Tortoise Council, Survey Techniques Workshop, Certificate of Completion November 2010
- Flat-tailed Horned Lizard BLM Survey Techniques Workshop, Certificate of Completion, 2010
- Desert Tortoise Council, Survey Techniques Workshop Certificate of Completion, 2006
- USFWS Arroyo Toad Workshop, Camp Pendleton Marine Base, 1999
- Willow Flycatcher Workshop, SD Natural History Museum, Certificate of Completion, 1995
- U.S. Fish and Wildlife 10(a) Permit to survey and monitor the Coastal California gnatcatcher and Least Bell's Vireo. Permit # TE799569.
- California state (CDFG) Scientific Collecting Permit / MOU for coastal California gnatcatcher, Least Bell's Vireo surveys

AFFILIATIONS

- Association of Field Ornithologists
- Marine Mammal Society
- National Association of Biology Teachers
- Society for Conservation Biology
- Society for the Study of Amphibians and Reptiles
- Wildlife Society

AWARDS / HONORS

- Best Natural History Research Film Award, Animal Behavior Society 2003
- Science Alliance Research of Excellence Award 1998
- CONICIT (Venezuela) Award for the Novel Researcher 1998
- CITES and Profauna (Venezuela) joint Research Grant 1996
- National Geographic Film and Research Grant 1996
- National Geographic Research and Exploration Awards 1996

- Wildlife Conservation Society Research Grant 1996
- Sierra Club Emily Durbin Leadership in Conservation Award 1995
- SDSU Harry Hamber Academic Graduate Scholarship 1993

SELECT RELEVANT EXPERIENCE

MHCP Restoration and Mitigation Monitoring, City of San Diego, CA (2011 –present). Ms. Owens is the lead biologist for sensitive species surveys and mitigation monitoring of parts of the Black Mountain Open Space Park, on behalf of Our Lady of Mount Carmel Catholic Church (San Diego) development expansion. Along with conducting protocol California gnatcatcher and Burrowing owl surveys, Ms. Owens is supervising all biological components of construction and mitigation monitoring, and is additionally coordinating with the City of San Diego to administer all mitigation and restoration efforts within the MHCP parcel on site.

Fuel Management Projects, Alpine Fire Safe Council and USDA Forest Service, San Diego County, CA. (2009-2011). As principal investigator she was responsible for the management of several projects regarding hazardous fuel reduction for the Alpine Fire Safe Council in areas contiguous to and within U.S. Forest Service (USFS) land. Responsibilities included habitat mapping, sensitive plant and bird surveys , GPS mapping of treatment sites, monitoring and management of fuel reduction teams (consisting of two to thirty individuals), and preparation of the Biological Evaluations as required by the Bureau of Land Management. Project management included consultation and coordination with private landowners, project scientists, Home Owners Associations, USFS, and BLM staff.

Wind Farm Development Project on BLM land, Imperial County, CA (2010-2011). Ms. Owens was one of the lead biologists conducting surveys for an Environmental Assessment (EA) incorporating extensive wildlife surveys throughout 15,000 acres of Bureau of Land Management (BLM) land in Imperial County. Surveys since 2009 include (1) migratory bird surveys throughout migration seasons, with focus on sensitive raptor observations, (2) Burrowing owl surveys, (3) Avian point count surveys, and (4) Flat-Tailed Horned Lizard surveys; her reports will be incorporated into the final EA. She has also submitted a scientific publication on unique observations regarding horned lizard neonates.

Fuel Management Projects, California Fire Safe Council and USDA Forest Service, San Diego County, CA (2009). Ms. Owens was the principal investigator responsible for the implementation of hazardous fuel reduction projects in San Diego County for the California Fire Safe Council. The project included protocol surveys for the California gnatcatcher, least Bell's vireo, Arroyo toad, and sensitive plant species; GPS mapping of treatment sites and TES (Threatened and Endangered Species), and creation of the Biological Evaluations/Biological Assessments and mitigation protocol as in compliance with the Bureau of Land Management and USFWS standards.

Perpetual Land Management Plan, San Diego County, CA (The Escondido Creek Conservancy, (TECC) 2005 – present). Owens Environmental is the principle biologist responsible for reporting on the status of two habitat preserve Habitat Conservation Plans. The areas combined incorporate 103 acres of riparian wetland, oak woodland, coastal sage scrub, and chaparral habitats known as the

San Elijo Ridge and the Greenland Habitat Preserve; created in compliance with CEQA and MHCP planning. The third party beneficiaries of these preserves are the USFWS and California Department of Fish and Game (CDFG). Project duties include surveying and reporting for TES plant and animal species as well as habitat suitability analysis and monitoring for the California gnatcatcher.

Endangered Species Conservation and Natural History Research (Profauna, Wildlife Conservation Society, 1996-2002). Funded by the National Geographic Research Foundation, Wildlife Conservation Society, and The Venezuelan National Council for Scientific and Technological Research (CONICIT), Renée was one of two lead biologists who carried out a unique 8 year research project on the natural history of the green anaconda. Research incorporated radio telemetry, mark and recapture, genetic analysis, and neonate study; findings were used to implement a sustainable conservation management program throughout 175,000 acres of flooded savanna and forest in Venezuela. Reports to the Venezuelan federal wildlife agency (Profauana) included habitat suitability analysis, population census and nest monitoring, and reintroduction of endangered species (Orinoco crocodile, Arau side-necked turtle, and the Red-footed tortoise); as well as genetic analysis and monitoring of the highly endangered giant otter. Ms. Owens additionally generated a resident bird list comprised of over 400 species, including one previously undocumented species for the country.

Threatened Species Monitoring and Critical Habitat Assessment, (USFWS) Camp Pendleton Marine Base, 1994-1995. Ms. Owens participated in a long term monitoring effort of the California gnatcatcher for the entire Camp Pendleton Marine Base in Oceanside, CA. The study was unique in that in incorporated surveys and monitoring of the species during both breeding and non-breeding seasons; Ms. Owens monitored over 30 active breeding pairs spanning an area of several thousand acres. Extensive data were collected on habitat suitability as related to nesting success, contributing to critical habitat assessments and recovery planning.

Endangered Species Recovery Plan (USFWS) 1991-1995. Ms. Owens conducted 5 years of breeding season nest monitoring surveys and brown-headed cowbird management as partial fulfillment of the USFWS Endangered Species Recovery Plan for the Least Bell's Vireo, under P.I. Barbara Kus. She was responsible for monitoring and reporting on 25 to 70 nesting pairs throughout San Diego County, including many on Marine Base Camp Pendleton, while providing habitat assessments and reports for Critical Habitat evaluation and population recovery analysis.

College Instruction / Adult Education

● Wildlife Conservationist Certification Training, San Diego, CA, 2011 - present. Ms. Owens developed an annual pilot program with a curriculum created to educate volunteer activists in wildlife management. Students are certified upon completion of classes, field trips, and a 30 hour volunteer investment in a local citizen scientist project related to wildlife conservation; training is sponsored by the CA Audubon Society and is pending further endorsement by the USFWS and California DFG.

● Full Time Temporary Instructor, Botany and Environmental Science, Department of Math, Science, and Engineering, Imperial Valley College, CA. 2008.

● Full Time Instructor, Tropical Ecology, Boston University Tropical Ecology Program, Quito, Ecuador. Responsibilities included lecture and intensive field study of tropical habitats including cloud and mangrove forest, Pacific intertidal zones, rainforest, Galapagos Islands, and paramo. 1999 –2000.

● Biology Instructor Adjunct, Biology, Palomar Community College, San Marcos, CA. 1994 - 1996.

● Biology Lab Instructor and Teaching Assistant, San Diego State University, San Diego, 1990-1993

Kathryn Riley

Wildlife Biologist

Areas of Expertise

Ornithology
Endangered species, ESA
Burrowing owl biology
SW willow flycatcher biology
Western snowy plover biology
Invasive species management
Ecology, field studies

Years of Experience

With URS: 1 Year
With Other Firms: 6 Years

Education

BS, Wildlife Management, California State University, Humboldt, 2006

Overview

Ms. Riley has over 7 years of wildlife experience, focusing primarily on avian ecology and management. She is currently involved in a variety of biological survey and monitoring efforts on several upcoming solar electric generating facility projects in the Sonoran and Mojave deserts of California. Previously, she was part of the ongoing federally listed southwestern willow flycatcher management effort along the lower Colorado River. She has extensive experience in bird banding and color band resighting of passerines and shorebirds, as well as experience in large regional efforts of sampling bird demographics along the southern range of the Rocky Mountains.

Project Specific Experience

Siberia Proposed Solar Electric Generating Facility (SEGF) Wildlife Biologist, March 2012 – Ongoing. 6,400 acre, 400 megawatt solar complex located near Ludlow, CA. Participated in migratory bird observation points, line-transects and focal surveys for CA State listed desert tortoise and burrowing owls. Served as a field liaison between remote field location and contracting office to ensure survey design and implementation met project specifications.

Rio Mesa Solar Electric Generating Facility (SEGF) Wildlife Biologist, March 2012 – Ongoing. 5,750 acre, 750 megawatt solar complex located near Blythe, CA. Participated in migratory bird observation points, line-transects and focal surveys for migratory birds and CA state listed Gila woodpecker.

S.W.C.A Environmental Consultants, Flagstaff, AZ, 2009 & 2007 May-August. Southwestern willow flycatcher recovery project along the Colorado River and tributaries in Nevada, Arizona and California. This project entailed re-sighting color banded birds, area censusing of local birds, GPS navigation, microclimate and vegetation monitoring, all-terrain vehicle and outboard motorboat operation, and data management.

Rocky Mountain Bird Observatory, Fort Collins, CO, 2008 May-July. Regional study along Rocky Mountain migratory corridor, conducting point counts of birds by habitat in northern Arizona. We used GPS to navigate a 15 point 3.25 km transect through dense habitat, and responsibilities included identifying all birds by sight and song, determining radial distance to individuals using a rangefinder, establishing new transects, recording local vegetation composition and structure, and data management.

Redwood Sciences Laboratories, Arcata, CA, 2006 April-October. Constant effort mist-netting of passerines as part of the Trinity River Restoration Project in northern California in cooperation with Klamath Bird Observatory and Humboldt Bay Bird Observatory. We operated 12 banding stations under a MAPS protocol in an effort to monitor passerine

demographics, specifically neo-tropical migrants. This project entailed operating mist-nets, banding passerine birds, area censusing local birds, facilitating public awareness of avian management, and data management.

Humboldt State University, 2006 February-April. Small mammal trapping and handling. As a member of the Wildlife department, assisted in collecting small rodents from Sherman traps for a student thesis project focusing on rodent demographics of local graze lands.

Mad River Biologist, Arcata, CA, 2005 May- September. Federally listed western snowy plover recovery and protection project in Humboldt County. Local beaches and rivers were surveyed via line-transects for color banded snowy plovers and nests. We constructed exclosures around nest sites for predator control, and monitored family units during brooding and fledgling periods.

Languages

English, Spanish

Specialized Training

2006, Certification
North American Banding Council certified Bander, Humboldt Bay Bird Observatory.

Contact Information

Kathryn Leigh Riley, Wildlife Biologist
URS Corporation
4225 Executive Square, Suite 1600
La Jolla, CA 92037
Tel: 858.812.8701
kathryn.riley@urs.com

Steve Ritt

4940 Cape May Ave.
San Diego, CA 92107
703.678.9893
stevenmritt@gmail.com

Qualifications

- Ability to rapidly identify all North American birds by behavior, sight, song, and call notes
- Experience conducting avian point-count and nest-searching surveys, and searching for rare species
- Experience conducting presence/absence surveys and behavioral observation of endangered species
- Permitted to conduct Southwestern Willow Flycatcher Presence/Absence Surveys
- Experience working in construction zones and with construction crews
- Extensive knowledge of flora of Eastern NA, and familiarity with flora of the Southwest and West
- Experience conducting aquatic, botanical, and general vegetative surveys
- Experience mist-netting and banding songbirds and raptors (~75 extracted/~30 measured and banded)
- Experience conducting radio telemetry
- Experience with GIS, GPS, and mapping
- Experience with technical writing, data entry, and general computing skills
- Extensive experience with managerial, administrative, and maintenance work
- Professional experience with public education among diverse demographics
- Strong knowledge of ecology and related fields
- Responsible, enthusiastic work-ethic and passion for learning

Professional Experience

Roadrunner Birding — November 2011 - present
Self-employed naturalist and guide for hire
- Personal guide for visiting and local birders
- Leader for bird festival trips and workshops

Ventures Birding and Nature Tours — May 2009, August 2011 - present
PO Box 1095
Skyland, NC 28776
Owner: Simon Thompson
Tour Leader
- Leader and planner for extended tours within the US
- Leader for day-trips, workshops, and personal guide for hire

University of California – Santa Barbara — January – March 2012
Carlsbad Field Office
2270 Camino Vida Roble
Suite D
Carlsbad, CA 92011
Supervisor: Andres Deza
Avian Biologist and Wetland Monitor
- Conduct point count surveys of wetland birds
- Assist other assistant biologists with bird ID
- Assist with tidal monitoring surveys of lagoons

Sunrise Powerlink — March-August 2011
Chambers Group Inc.
9909 Huennekens Street, Suite 206
San Diego, CA 92121
Supervisor: Kris Alberts

Avian Biologist and Construction Monitor
- Conducted pre-construction nest-searching surveys
- Conducted Burrowing Owl surveys
- Verified potential nesting reports
- Requested Nest Buffers and Nest Buffer Reductions
- Edited data and wrote Species Accounts for Annual Report
- Worked with construction crews to ensure environmental compliance without hindering construction
- Performed Biological Construction Monitoring

Southwestern Willow Flycatcher Study May-August 2010
SWCA Environmental Consultants
114 N. San Francisco St., Suite 100
Flagstaff, AZ 86001
Supervisors: Mary Anne McLeod, Anne Pelligrini
Survey Technician
- Surveyed for SWFL using broadcast and habitat assessment
- Resighted color-banded birds and collected behavioral data
- Collected data on other California Species of Special Concern
- Collected habitat and botanical ("vegetative") data

Bake Oven Knob Hawkwatch August-November 2009
Lehigh Gap Nature Center
PO Box 198
Slatington, PA 18080
Supervisor: Dan Kunkle
Official Counter for Fall Hawkwatch
- Identified, compiled, and posted hawk count data for LGNC and HMANA
- Educated general public and local school classes on hawks, hawk ID, and natural history

Ohio Breeding Bird Atlas II May-July 2009
210 Kottman Hall, 2021 Coffey Rd.
Columbus, OH 43210
Supervisor: Aaron Boone
Field Survey Technician
- Conducted point-count surveys for abundance and habitat data
- Conducted "blockbusting" surveys for breeding status data
- Was directed to confirm rare bird reports

University of North Carolina, Asheville 2008-2009
NCCCR, Reuter Center, CPO #5000, UNC Asheville, One University Heights
Asheville, NC 28804-8516
Supervisor: Mike McCreary
Taught classes and workshops through the Blue Ridge Naturalist Program
- Birding by Ear, Spring and Fall Songbird Migration, Hawk Watch, Bird Behavior, and other birding classes and workshops
- Plant identification, cultivation, and wildcrafting classes and workshops
- Numerous other nature-based workshops

Weeds, Wings, and Things 2006-2009
Self-employed naturalist and guide for hire
- Led interpretive walks and tours for private groups and individuals
- Presented lectures, workshops, and field trips for schools and home-school groups
- Conducted avian and botanical surveys for environmental consulting firms

Mountain Air Country Club May-October 2006
P.O. Box 1037, Burnsville, North Carolina 28714

Supervisor: Kat Dunham
Seasonal Naturalist
- Led interpretive nature walks and tours for residents
- Expanded inventories of flora and fauna
- Supervised and taught children in Junior Naturalist Camp
- Developed plan for Audubon Golf Course Certification

Other Employment

Laurel Springs Nursery — Spring 2009, Winter/Spring 2010
34 Country Rd, Hendersonville, NC 28792
Supervisor: Wes Burlingame
Assistant Nurseryman
- Worked with all aspects of plant husbandry from cultivation to monitoring and installation
- Assisted with retail sales and customer service (of predominantly native stock)
- Monitored, maintained, and repaired greenhouses, irrigation, and other infrastructure

French Broad Food Co-op — 2002-2006
90 Biltmore Ave., Asheville, North Carolina 28801
Supervisor: Mike McCreary
Store and Operations Manager
- Made major business decisions as part of Senior Management Team
- Supervised staff of 30 employees
- Managed three departments (Maintenance, Front-end, and IT)

Volunteer Experience

San Diego Audubon Society — Winter 2011 - present
- Leader/Docent for numerous field trips and workshops

San Dieguito Lagoon Monthly Bird Counts — Winter 2010 - present
- Assisted with monthly bird surveys and education

Warren Wilson College — Winter/Spring 2010, September 2011
701 Warren Wilson Rd, Swannanoa, NC 28778
- Teaching assistant for Field Ornithology and Field Ecology classes
- Guest Lecturer for Field Ornithology, Field Ecology, and Environmental Studies classes
- Field Trip Leader for Bird Crew

San Diego Bird Festival 2011 — March 2011
- Leader and Co-leader for Estuary Walks

Marine Science Institute, UC Santa Barbara — February 2011
Santa Barbara, CA 93106-6150
- Assisted with fish sampling of San Dieguito Lagoon Restoration Project

San Diego Natural History Museum — Fall 2010 - present
P. O. Box 121390, San Diego, CA 92112-1390
- Co-leader for Western Field Ornithologists 2010 Annual Conference field trip *Exploring the Santa Rosa Mountains Grinnell Transect*
- Field assistant for Grinnell and Swarth Centennial Resurvey of the Santa Rosa Mountains
- Prepared avian skeleton specimens, and assisted with other lab and office duties

Elisha Mitchell Audubon Society — 2009 - 2010
PO Box 18711, Asheville, North Carolina 28814
- Webmaster (Winter/Spring 2010)

- Co-leader for monthly bird walks
- Assisted with maintenance of Beaver Lake Bird Sanctuary through exotic-invasive plant identification, removal, and public education

Ned Smith Center/ Scott Weidensaul — Fall 2009
176 Water Company Road, Millersburg, PA 17061
- Assisted with mist-netting, banding, and radio tracking Saw-whet Owls

Brad Silfies – Independent songbird and raptor bander — Fall 2009
1525 Blue Mtn Dr., PO Box 242, Danielsvile, PA 18038
- Assisted with mist-netting and banding of songbirds and raptors

Mt. Pisgah Hawk Watch — 2008
Mills River Overlook, Blue Ridge Parkway milepost 404.5, North Carolina
Supervisor: Bill Sanderson
- Collected count data for fall migration

Western North Carolina Nature Center — 2004
75 Gashes Creek Road, Asheville, North Carolina 28805
Supervisor: Keith Mastin
- Assisted with maintenance of birds, mammals, and herps
- Provided interpretive education for visitors and off-site school trips

Education

B.S. Biology - Warren Wilson College, Asheville, North Carolina — 2003

Heather Rothbard

Botanist / Environmental Scientist / Planner

Areas of Expertise

401/404 Jurisdictional Delineations
Biological Surveys and Desert Tortoise and Burrowing Owl
Habitat Enhancement and Restoration Site Development
Monitoring and Management
NEPA Documentation
Phase I Environmental Site Assessments
Integrated Natural Resource Management Plans
Pest Management Plans
Biological Reviews

Years of Experience

With URS: 1 year
With Other Firms: 7 Years

Education

BS, Botany: Emphasis in Environmental Science and Ecology, Arizona University, Tempe, Arizona, 2003

Overview

Ms. Rothbard has more than eight years of experience in botanical/biological survey and environmental regulatory compliance. Her experience includes rare and sensitive plant surveys, noxious weed surveys, percent cover surveys, rangeland studies including flora identification, habitat enhancement and restoration site development, monitoring, and management, biomass and species diversity data collection, biological surveys for desert tortoise and burrowing owl, National Environmental Policy Act (NEPA) documentation, environmental site assessments, Section 404 delineation and permitting including ephemeral washes, intermittent and perennial steams, and freshwater, tree-dominated wetlands, Phase I Environmental Site Assessments, Integrated Natural Resource Management Plans and Pest Management Plans, and biological reviews. Ms. Rothbard has managed and performed numerous plant surveys, 401/404 jurisdictional delineations, managed and performed a biological and soil salinity study on a major oilseed crop for the USDA-ARS, and held responsibility for arthropod collection and identification, identification of native and non-indigenous plants, soil and plant root collection for mycorrhizal fungi detection, and vegetation sampling and monitoring at sites in the Phoenix metro and surrounding area for the Central Arizona Phoenix Long-Term Ecological Research Project (CAP-LTER). Vegetative areas of study include low to high desert, chaparral, coastal chaparral, juniper/pinyon pine, coniferous and hardwood forests, grasslands, and rangelands.

Project Specific Experience

Clean Water Act Section 404 Delineation and Permitting

Ms. Rothbard prepared Section 401/404 jurisdictional delineations for waters of the U.S., including ephemeral washes, intermittent and perennial steams, and freshwater, tree-dominated wetlands. She has also prepared nationwide and individual permit applications. Her Section 404 work includes projects in Arizona, Oklahoma, California, and South Carolina.

National Environmental Policy Act

Ms. Rothbard prepared National Environmental Policy Act (NEPA) environmental assessments (EAs), Integrated Natural Resource Management Plans (INRMPs), and technical studies for environmental impact statements (EISs) for water distribution and collection, utility, development, aviation, and transportation projects in Arizona, Hawaii, Oklahoma, Nevada, Kansas, California, and Japan. Clients include municipalities, transportation departments, United States Air Force Bases, United States Naval Bases, United States Marine Corps Air Stations, National Guard Training Facilities, and private developers.

Restoration/Habitat Enhancement

Ms. Rothbard served as assistant project manager/field manager for restoration and habitat enhancement projects for United States Marine Corps Stations, United States Border Protection, and private developers in California and Arizona. Projects include habitat enhancement for endangered species, wetland creation and monitoring, invasive plant removal and monitoring, and developing plans for restoration/habitat enhancement sites.

Botanical/Biological Surveys

Ms. Rothbard conducted numerous botanical surveys including noxious weed, rare plant, percent cover, and rangeland diversity surveys in Arizona, California, and New Mexico. Vegetative areas include low to high desert, coastal-shrub chaparral, coastal dunes, juniper/pinyon pine, coniferous forest, grasslands, and rangelands. Clients include utilities, railroads, local, state, and federal land management departments. Ms. Rothbard has also conducted several biological surveys for desert tortoise (*Gopherus agassizii*), burrowing owl (*Athene cunicularia*), and habitat for threatened and endangered bat species in California and Arizona.
Environmental Site Assessments

Ms. Rothbard has conducted Phase I Environmental Site Assessments (ESAs) of undeveloped, industrial, residential, and commercial facilities in Arizona. Clients included municipalities, commercial developers, Native American Tribes, and residential developers.

December 2010 – Present: Botanist/Wetlands Scientist ,URS Corporation, San Diego, California

May 2009 - 2010: Botanist/Environmental Scientist/Planner, AMEC Earth & Environmental, Inc., San Diego, California

2006 – May 2009: Botanist/Environmental Scientist/Planner, AMEC Earth & Environmental, Inc., Tempe, Arizona

2005 - 2006: Botanist/Forestry Planner, Arizona Public Service, Cottonwood, Arizona

2004 - 2005: Field Research Technician, International Institute for Sustainability, Arizona State University, Tempe, Arizona

2002 – 2004: Research Technician, USDA-ARS Water Conservation Lab., Phoenix, Arizona.

National Environmental Policy Act

Environmental Review (ER) for Construction of a Type III Fuelling System at Marine Corps Air Station Iwakuni, Iwakuni, Japan. 2010: Ms. Rothbard is the environmental scientist preparing an ER that addresses the construction of a Type III Fuelling System at MCAS Iwakuni, Japan. The ER includes a detailed assessment of impacts related to constructing a Type III Fuelling System and associated supporting structures in the old airfield in order to support the MCAS Iwakuni Base Master Plan and Mission to support refueling of large aircraft including C-

5s and KC-130s. The ER is being prepared in accordance with Japan Environmental Governing Standards (JEGS) and Executive Order (EO) 12114 (*Environmental Effects Abroad of Major Federal Actions*).

Environmental Assessment (EA) for the Beddown of the 604th ASOC at Wheeler Army Airfield, O'ahu, Hawaii. 2010:
Ms. Rothbard was the environmental scientist preparing an EA that addressed relocation of the 604th Air Support Operations Center (ASOC) from Korea to Wheeler Army Airfield. The EA includes a detailed assessment of impacts related to renovation of two historic buildings, renovation of a motorpool parking area, construction of an additional parking area, and the addition of personnel, radios, and vehicles to Wheeler Army Airfield, training sites on O'ahu, and the surrounding area.

Transboundary Environmental Information Document for Drinking Water Distribution Expansion to Unserved Areas, Colonia Luis Donaldo Colosio, Border Environment Cooperation Commission (BECC), Nogales, Sonora, Mexico. 2009:
Ms. Rothbard was the environmental scientist for a Transboundary EID for the BECC to address potential environmental impacts of the proposed expansion of the drinking water distribution system into unserved areas of Colonia Luis Donaldo Colosio in Nogales, Sonora. The EID presents potential impacts that are likely to occur on both the US and Mexico sides of the border. AMEC is working to meet BECC's aggressive schedule for completion of this EID. The EID is being reviewed by EPA Region 9.

Transboundary Environmental Information Documents for Expansion of Drinking Water Distribution and Disinfection System in Colonia Esperanza and Improvements to Wastewater Collection and Treatment Systems Juárez Municipality, Border Environment Cooperation Commission, Colonia Esperanza and Juárez Municipality, Chihuahua, Mexico. 2010:
Ms. Rothbard assisted in the preparation of EIDs to address potential environmental impacts of the proposed expansion of the drinking water distribution system and the addition of a chlorination unit in Colonia Esperanza and Improvements to wastewater collection and treatment systems in Juárez Municipality. The EIDs present potential impacts that are likely to occur on both the US and Mexico sides of the border. The inclusion of two EIDs for neighboring areas under a single contract allowed for cost savings. As part of a separate contract, BECC is conducting water quality modeling for the multiple treatment plants within Juárez Municipality. AMEC will work with BECC to incorporate the findings of this modeling into the EID.

Transboundary Environmental Information Document for Construction of a Wastewater Collection System in Reynosa, Tamaulipas, Border Environment Cooperation Commission, Reynosa, Tamaulipas, Mexico. 2009-2010:
Ms. Rothbard assisted in the preparation for a NEPA compliant transboundary EID to address the impacts of construction of a wastewater collection system within a portion of Reynosa that does not currently have wastewater collection or treatment. This project is receiving funding from the Border Environment Cooperation Commission (BECC). BECC receives federal funds from the U.S. and Mexico for projects that improve environmental conditions within the U.S.-Mexico border region.

EA for T-10 Hush House, Tinker Air Force Base, Oklahoma. 2008:
Ms. Rothbard assisted in the preparation of an EA that addresses refurbishment of a T-10 hush house at Tinker Air Force Base. Refurbishment of the hush house is proposed to address an increase in engine testing. The EA includes a detailed assessment of impact related to noise and vibration associated with operation of the hush house and the potential impacts of noise and vibration on the air traffic control tower that will be constructed near the hush house. The EA had a challenging four month schedule, which AMEC met.

EA for Proposed Construction of Two Readiness Centers, Field Maintenance Shop, and Regional Training Institute, Florence Military Reservation, Pinal County Arizona. 2008:
Ms. Rothbard assisted in the preparation of an EA at Florence Military Reservation for the construction of training and administrative facilities. The EA was prepared in accordance with NEPA, Council on Environmental Quality (CEQ) Regulations, Army Regulation (AR) 200-1 on Environmental Protection and Enhancement (revised August 2007), Department of Defense (DoD) Instruction 4715.3 (Environmental Conservation Program), and the National Guard Bureau (NGB) NEPA Handbook (revised June 2006). One challenge of this EA was an extremely short schedule.

EA of New Facilities at Yuma International Airport, Yuma, Arizona, Merrick & Company/TEPA/Department of Homeland Security Customs and Border Protection, AZ. 2009:
Ms. Rothbard is assisting in preparing an Environmental Assessment to address Custom and Border Protection Air and Marine Section's construction of new facilities and operations at the Yuma International Airport. The proposed action includes construction of facilities needed to fly and maintain helicopters and fixed wing aircraft and the operation of that aircraft for border security activities. Ms Rothbard is the environmental scientist for this effort.

Diamond Valley Speed Racing, Marathon Racing, LLC, Diamond Valley, Nevada, CA. 2007:
Ms. Rothbard prepared numerous resource sections of an EA for BLM land in Diamond Valley, Nevada. The project area was within the jurisdiction of BLM's Battle Mountain Field Office.

Environmental Information Document, Wastewater System Expansion Program Conventional Gravity Sewer Collection System, Lake Havasu City Arizona. 2008-2012:
Ms. Rothbard prepared an Environmental Information Document (EID) update for the second five-year period of Lake Havasu City's Wastewater System Expansion Program. AMEC is preparing the EID in accordance with the Arizona Water Infrastructure Finance Authority's guidelines. Since the program is receiving federal funds through the Clean Water State Revolving Fund, the EID must be NEPA compliance. Ms. Rothbard is the environmental scientist for this effort.

Winter Storm Management/Operations Plan and EA, Arizona – Statewide, Arizona Department of Transportation, AZ. 2008:
AMEC was awarded the development of a Winter Storm Management/ Operations Plan and EA for the implementation of that plan. Ms. Rothbard prepared the NEPA portion for this project. Preparation of the EA for this project will consist of collecting, reviewing, and evaluating data to define environmental thresholds related to such factors as air quality, socioeconomic factors, water quality, and biological resources. In concert with the evaluation of environmental issues, AMEC's winter storm management specialists will be reviewing winter storm management alternatives regarding cost, including long-term costs such as impacts to pavement, and effectiveness.

Three EAs for Consolidated Wing Headquarters, New Control Tower, and Realignment of Air Depot Boulevard, Tinker Air Force Base, Oklahoma. 2008:
Ms. Rothbard is the environmental scientist for preparation of EAs for three projects at Tinker Air Force Base. The projects include construction of a consolidated wing headquarters, construction of a new control tower, and realignment of Air Depot Boulevard. The project is being performed under the requirements of the Air Force Center for Environmental Excellence.

EA Revision for Construction of Consolidated Fuel Overhaul and Repair Facility, Tinker Air Force Base, Oklahoma. 2007:
Ms. Rothbard was the environmental scientist for revision of an EA for construction of a consolidated fuel overhaul and repair facility. This project is being performed under the requirements of the Air Force Center for Environmental Excellence (AFCEE). The project will impact a wetland; therefore, AMEC's scope of work includes preparation of a Finding of No Practicable Alternative (FONPA) and inclusion of wetland mitigation in the EA.

EA for BRAC Actions, Luke Air Force Base, Arizona. 2007:
Ms. Rothbard assisted in the preparation of an EA for Base Realignment and Closure (BRAC) actions at Luke Air Force Base (AFB) affecting aircraft inventory, aircraft flight operations, and associated mission realignment.

507th KC-135 Transfer EA, Tinker Air Force Base, Oklahoma. 2007:
Ms. Rothbard assisted in the preparation of an EA for the proposed expansion of the airfield/apron fuel hydrant system; construction of Air Force Reserve Command and Air National Guard squadron operations, operations support squadron, life support storage, and life support work area; construction of a new hangar; and building renovation under the requirements of the Air Force Center for Environmental Excellence.

51st Avenue Intersection Improvements, City of Glendale, Glendale, Arizona. 2007:
Ms. Rothbard was the environmental scientist/botanist for environmental work, including native plant surveys and biological assessments, related to projects involving intersection improvements at 51st Avenue and Northern Avenue and 51st Avenue and Camelback. The project sponsor, the City of Glendale, was applying for federal funds for these projects; therefore review through the Arizona Department of Transportation's Local Government Program was necessary.

Transboundary Environmental Site Assessment for Construction of a Water Distribution and Wastewater Collection System in Tecate, Border Environment Cooperation Commission, Tecate, Baja CA. 2007:
Ms. Rothbard prepared a NEPA compliant environmental assessment (EA) to address the impacts of construction of a water distribution and wastewater collection system within colonias of Tecate, Baja California. This project is receiving funding from the Border Environment Cooperation Commission (BECC). BECC receives federal funds from the U.S. and Mexico for projects that improve environmental conditions within the U.S.-Mexico border region.

Clean Water Act Section 404 Delineation and Permitting

Preliminary Jurisdictional Determination and Delineation of Jurisdictional Waters of the US and Waters of the State of California, Rio Mesa Solar Electric Generating Facility, Blythe, Riverside County, CA. 2011:
Ms. Rothbard performed field reconnaissance for a preliminary determination of the jurisdictional status and delineation of the boundaries of Waters of the United States (WUS) and Waters of the State of California (WSC) on the site of the proposed Rio Mesa SEGF. The 11,277-acre study area includes the property, a transmission-line corridor and survey buffers. The assessment was performed for permitting requirements under Section 404 and 401 of the Clean Water Act and Section 1602 of the California State Fish and Game Code.

Preliminary Determination and Delineation of Jurisdictional Waters of the US and Waters of the State of California, Jurupa Community Services District Regional Park, Mira Loma, Riverside County, CA. 2009:
Ms. Rothbard performed field reconnaissance for a preliminary determination of the jurisdictional status and delineation of the boundaries of Waters of the United States (WUS) and Waters of the State of California (WSC) on the site of the proposed Jurupa Community Services District Regional Park (Eastvale Community Park). The 89.95-acre study area includes the Property and areas immediately adjacent including Citrus Street to the north, Hamner Avenue to the east, private property to the west, and the Santa Ana River to the south. The assessment was performed for permitting requirements under Section 404 and 401 of the Clean Water Act and Section 1602 of the California State Fish and Game Code.

Preliminary Determination and Delineation of Jurisdictional Waters of the US and Waters of the State of California, Moreno MDP-Line K Project, Moreno Valley, Riverside County, CA. 2009:
Ms. Rothbard performed field reconnaissance for preliminary determination of the jurisdictional status and delineation of the boundaries of Waters of the United States (WUS) and Waters of the State of California (WSC) for the Moreno MDP-Line K Project. AMEC was contracted by Riverside County Flood Control and Water Conservation District to perform this assessment on the approximately 38.7-acre project site. The project area includes the Property and areas immediately adjacent including Ironwood Avenue to the north, Oliver Street to the west, undeveloped property to the east, and the State Highway 60 to the south. An assessment of the area of jurisdictional waters within the project boundary, including general information on permitting requirements under Section 404 and 401 of the Clean Water Act and Section 1602 of the California State Fish and Game Code, was determined by Ms. Rothbard. No project design information was available at the time this report was written so no analysis of impacts or analysis of permitting requirements was performed.

Section 404 Jurisdictional Delineation, Arizona State Lands Department, 303 Peoria East, Maricopa County, AZ. 2008:
Ms. Rothbard served as field reconnaissance leader to identify and establish boundaries of Section 404 jurisdictional areas on the 4,600 acre project site. Jurisdictional areas are identified and delineated in accordance with the USACE's 1987 Wetland Delineation Manual, the USACE's 2001 guidelines for conducting JDs in the arid southwest, USACE's 2006 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, and USACE's June 2007 Rapano's Guidance Memorandum. Ms. Rothbard prepared the results of the JD in a technical report. The technical report includes a description of the project area drainage features including width, depth, substrate, vegetation characteristics, hydrology, and connectivity to the Agua Fria and New Rivers.

Arkoma Connector Pipeline Environmental Field Surveys, MarkWest Energy Partners, L.P. - Atoka, Bryan, and Coal Counties, Oklahoma, AMEC Paragon. 2007-2008:
Botanist/Environmental Scientist. The Arkoma Connector Pipeline will provide transportation for natural gas from the Woodford field in southeastern Oklahoma to major interstate pipeline systems and will consist of one 24-inch diameter pipeline, approximately 50 miles in length, one compressor station of approximately 10,000 horsepower, and associated pipeline support facilities, including a pig launcher and receiver, and metering equipment. Environmental components of the survey program include land use, wetlands delineation, and threatened and endangered species habitat delineation in accordance with the US Army Corp of Engineers, US Fish and Wildlife Service, and FERC regulations. The surveys were conducted in areas along the proposed pipeline 300 ft. ROW.

Maricopa County Department of Transportation, Power Road and Guadalupe Road Bridge Expansion, Mesa, AZ. 2008:
Ms. Rothbard was monitoring construction activities for compliance with conditions of Clean Water Act Section 404 Nationwide Permit Numbers 12 and 14 and general conditions of Section 401 Water Quality Certification. Construction activities include widening the bridges that cross the floodway that flows underneath Power Road and Guadalupe Road. Ms. Rothbard's participation included tri-weekly site visits and weekly reporting of site conditions for three months.

McEntire Joint National Guard Base, Base-wide Wetland Delineation, National Guard Bureau, Columbia, South Carolina. 2007:
Ms. Rothbard conducted wetland delineation surveys of wetlands and other waters of the U.S. within the Common Installation Footprint per the methods described in the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual at McEntire Joint National Guard Station in South Carolina. Her participation in these surveys included identifying plant species, determining soil color and texture, completing wetland data report forms, and reviewing the wetland delineation report. Section 404 Jurisdictional Delineation Shadow Ridge Subdivision, Millennia Investment Corporation, Mohave County, Arizona (2007). Ms. Rothbard was the environmental scientist/botanist for a Section 404 Jurisdictional Delineation for waters of the United States associated with the development of a 165 acre subdivision in the unincorporated town of Scenic, Arizona. AMEC was selected to assist the client in resolving Clean Water Act Section 404 violations that occurred when portions of the site were graded prior to issuance of a Section 404 permit. AMEC's services included field reconnaissance to identify and establish boundaries of Section 404 jurisdictional areas on the project site and identification of biological resources.

Section 404 Permitting WACOG Air Industrial Park, AMEC Infrastructure/Lake Havasu City. 2007:
Ms. Rothbard was the environmental scientist/botanist for Clean Water Act Section 404 permitting services related to the development of an industrial park near the Lake Havasu City airport. AMEC's environmental services for this project included review of previous environmental documents for the project area, review of grant funding pathways to determine if NEPA documentation is necessary, and preparation of a Section 404 individual permit application. The Section 404 documentation included verification of previously delineated limits of waters of the United States, an environmental assessment (EA) prepared in accordance with U.S. Army Corps of Engineers guidelines, and a compensatory mitigation and monitoring plan.

Section 404 Jurisdictional Delineation, Florence Military Reservation, Pinal County, AZ. 2007:
Ms. Rothbard completed a Section 404 Jurisdictional Delineation for waters of the United States, at 20 utility road crossings at Florence Military Reservation, using the U.S. Army Corps of Engineers guidelines for determining waters of the United States in arid regions.

Section 404 Jurisdictional Delineation and Permitting, Prospectors Road, Pinal County, AZ. 2007:
Ms. Rothbard served as environmental scientist/botanist for a Section 404 Jurisdictional Delineation and permit application associated with improvements to Prospectors Road in Apache Junction, Arizona. Ms. Rothbard's responsibilities included the field reconnaissance for the jurisdictional delineation, botanical survey, and production of a Section 404 Jurisdictional Delineation report and permit application.

Natural Resources Survey, Management, and Documentation

Integrated Natural Resources Management Plans, United States Navy, Naval Weapons Station, Seal Beach Detachment Corona, CA. 2010:
Ms. Rothbard is serving as the primary environmental scientist for the revision and completion of an Integrated Natural Resources Management Plan for Naval Weapons Station Seal Beach Detachment Corona, near Norco, California. The INRMP documents natural resources within the installation and serves as a tool for the United States Navy. In addition to the INRMP, Ms. Rothbard is preparing a NEPA compliant EA for implementation of the INRMP.

Integrated Pest Management Plan Update, Kansas Army National Guard, Statewide, Kansas. 2009:
Ms. Rothbard was the environmental scientist responsible for the completion of an update to the Kansas Army National Guard's Statewide Integrated Pest Management Plan (IPMP). The IPMP's objective includes providing guidance necessary to operate and maintain effective management of pests and invasive species via the judicious application of

chemical and non-chemical control techniques. The IPMP outlines procedures intended to manage pests while minimizing the potential for adverse environmental consequences. The IPMP also establishes standard operating procedures addressing the proper methods for storage, handling, mixing, and applying control agents. Ms. Rothbard prepared the IPMP update in compliance with Department of Defense (DoD) Instruction 4150.7, *DoD Pest Management Program* and Army Regulation 200-5, *Pest Management*.

Environmental Services Applications - Six Rivers National Forest Trinity County Bridges and 3R, Trinity County, Jacobs Civil/Federal Highway Administration. 2008:
Ms. Rothbard was the biologist for AMEC's environmental services related to the replacement of 5 bridges and roadway improvements within the Six Rivers National Forest. Ms. Rothbard prepared application documents for both the California Department of Fish and Game's Notification of Lake or Streambed Alteration and California Regional Water Quality Control Board's 401 Water Quality Certification.

Integrated Natural Resources Management Plans, Arizona Department of Emergency and Military Affairs, Camp Navajo and Florence Military Reservation, AZ. 2007-2009:
Ms. Rothbard was serving as the primary environmental scientist for completion of Integrated Natural Resources Management Plans (INRMPs) for Camp Navajo, near Bellemont Arizona, and Florence Military Reservation, near Florence, Arizona. The INRMPs document natural resources within the installations and serve as a tool for the Arizona Army National Guard to manage those resources. In addition to the INRMPs, Ms. Rothbard is preparing National Environmental Policy Act (NEPA) compliant Environmental Assessments (EAs) for implementation of the INRMPs.
Restoration/Habitat Enhancement

Endangered Willowy Monardella Habitat Enhancement, MCAS Miramar, San Diego, CA. 2009-2010:
Ms. Rothbard is the field manager for this enhancement project with the overall goal to protect existing populations of willowy monardella (*Monardella linoides* ssp. *viminea*) and improve current habitat conditions so that these populations can expand. Ms Rothbard manages and participates in censusing, mapping, and conducting habitat assessments of existing willowy monardella populations and assisted in the development of ongoing enhancement and monitoring techniques.

Spring Canyon Riparian Restoration Project, San Diego County, CA. 2009-2010:
AMEC has conducted multiyear protocol and sensitive species surveys, wetland delineations, and regulatory permitting. As part of the overall mitigation for project impacts, AMEC has planned and implemented wetland creation, restoration, and enhancement of over 5 acres of riparian wetlands in Spring Canyon. Ms. Rothbard is the field manager for this 5-

acre site that has restored, enhanced, and created riparian habitat mitigation associated with impacts from border fence projects. Long-term activities include habitat enhancement, monitoring, and reporting.

Imperial Irrigation District Managed Marsh Planting, Calipatria, CA. 2009:
Ms Rothbard served as Assistant Project Manager for developing and planting of a 365 acre created marsh. The Imperial Irrigation District is developing over 900 acres of a Managed Marsh for the benefit of certain listed species, including the Yuma Clapper Rail and the California Black Rail. This project encompasses 365 acres in 20 cells, and is Phase 1 of the larger 900 acre project. AMEC began the planting in early September 2009, with a required completion date of October 31, 2009, which was met. This schedule required the development of a planting and water management plan that would assure the plants adequate water during the hot weather, yet without excessively inundating plants in the lower portions of the cells. AMEC completed the project on schedule, and with excellent survivorship and health of the introduced plant material. Ms Rothbard supervised the field crews in the planting activities, and handled daily water management tasks in accordance with the needs of the plants and in collaboration with the client. AMEC has subcontracted with a variety of local farmers and support personnel, creating a broad base of local support and involvement, which is of considerable benefit to the Imperial Irrigation District.

Botanical/Biological Surveys

San Diego Air Force Space Surveillance Station Revegetation, Brown Field, San Diego, CA. 2010-2011:
Ms. Rothbard performed biological surveys and is assisting with compliance with the revegtation requirement and Biological Opinion at this lead clean-up site at Brown Field in south San Diego County.

Vegetation mapping, spring and fall rare plant, desert tortoise, burrowing owl, point bird counts, and Mojave fringe-toed lizard surveys at the Rio Mesa Solar Electric Generating Facility, Blythe, Riverside County, CA. 2011:
Ms. Rothbard served as Task Manager for rare plant surveys and performed surveys several species on the site of the proposed Rio Mesa SEGF. The 11,277-acre study area includes the property, a transmission-line corridor and survey buffers. Ms. Rothbard also helped prepare the Biological Resources Technical Report and Application for Certification submitted to the California Energy Commission.

Vegetation mapping and rare plant survey, Sunset Cliffs Park. San Diego, CA. 2011:
Ms. Rothbard performed biological surveys and prepared a biological report and revegetation plan for this park improvement project on Point Loma in San Diego.

Mira Sorrento Parkway, San Diego, CA. 2011:
Monitoring ecologist responsible for annual and semi-annual monitoring and reporting. This project involves the revegetation of several acres of coastal sage scrub along a newly created road on property managed by the City of San Diego.

Thurgood Marshall Middle School Wetland Revegetation, San Diego, CA. 2011:
Monitoring ecologist responsible for annual and maintenance monitoring and reporting. This project involves the revegetation of a creekbed and adjacent wetlands along Caroll Canyon Creek. Work begins performed for san Diego Unified School District.

Burrowing Owl Presence/Absence Survey of the Lake Havasu City Wastewater System Expansion Program Conventional Gravity Sewer Collection System, Lake Havasu City, AZ. 2010:
Ms. Rothbard served as Assistant Project Manager/Field Leader for conducting Burrowing Owl (*Athene cunicularia*) presence/absence pre-construction surveys for sewer pipe installation in the eastern section of Lake Havasu City. Ms Rothbard also prepared a biological assessment outlining recommendations and instructions according to Arizona Burrowing Owl Working Group's *Burrowing Owl Project Clearance Protocol.*

Dye Road Burrowing Owl Clearance Surveys, Ramona, CA. 2009:
Ms. Rothbard performed biological surveys in the right of way footprint for the realignment of Dye Road. These surveys included summer and wintering presence/absence surveys for burrowing owl (*Athene cunicularia*) Ms Rothbard followed California Fish and Game Burrowing Owl Consortium Guidelines.

Rare Plant Survey, San Vicente Road, Poway, California. San Diego County, CA. 2009:
Ms. Rothbard performed rare plant surveys along 7 miles of right of way along San Vicente Road in Poway, California. Plants surveyed for included a dozen species on the San Diego County Sensitive Species List.

Vegetation Identification through Airborne Photography, Statewide, AZ. 2009:
Ms. Rothbard is managing and performing plant identification along 180-miles of right-of-way using airborne photographs, taken by helicopter. The project includes identifying vegetation to species, determining dominant species, and determining percent cover by vegetation type. All plant identification, vegetative habitat determination, and technical writing was performed by Ms. Rothbard. Under this contract, Ms. Rothbard assembled a training manual and training presentation to aid technicians in vegetation identification within and around 4,000 miles of right-of-way using the airborne photographs. Ms. Rothbard will quality control all vegetation identification before submittal to end client.

Noxious Weed Survey for Palo Verde-North Gila 500kV Conductor Maintenance Project, Arizona Public Service and BLM Yuma Field Office, Yuma to Gila Bend, AZ. 2006-2010:
Ms. Rothbard is managing and performing a noxious weed survey in the right of way of a high voltage power line that extends from Yuma to Gila Bend. All plant identification, vegetative habitat determination, and technical writing was performed by Ms. Rothbard. Under this contract AMEC performed a survey in 2008 and will perform additional surveys in 2009 and 2010. The surveys are being performed in accordance with an agreement between the APS Land Department and the United States Bureau of Land Management (BLM). For purposes of this survey, noxious and invasive weeds are defined as species included on the Arizona Department of Agriculture's (ADA) Prohibited, Regulated, and Restricted Noxious Weeds List, and the Noxious Weed List for the Yuma Field Office (YFO) of the BLM. The project received funding through Arizona Public Service however all data collection was performed on state and federal lands including BLM and the Yuma Proving Grounds.

Revegetation Assessment, Gallup, McKinley County, New Mexico. 2008:
Ms. Rothbard managed and performed vegetation surveys within the project site and at nearby point bars to evaluate vegetation recovery resulting from reseeding activities conducted by BNSF Railroad in November 2006. The surveys were conducted to evaluate project site recovery using a random meter^2 plot method to determine if percent cover was within the parameters as specified by the 2006 USACE 404 permit requirements for the project site. Ms. Rothbard prepared a report that summarizes information on the recorded occurrence of species, native status, and comparisons between, the project site and a nearby undisturbed site to evaluate vegetation recovery to pre-construction conditions. In addition, recommendations and suggestions were given for future evaluation and timeline of vegetation recovery at the site.

Palmdale Power Plant Biological Surveys, Palmdale, CA. 2008-2010:
Ms. Rothbard performed biological surveys in the right of way of a high voltage power line. These surveys included rare and sensitive plants, desert tortoise (*Gopherus agassizii*), and burrowing owl (*Athene cunicularia*) surveys.

Threatened and Endangered Species Surveys, United States/Mexico Border Fence Project – Tucson Sector, Gulf South Research Corporation (GSRC)/U.S. Army Corps of Engineers Fort Worth District, Pima and Santa Cruz Counties, AZ. 2009:
AMEC has worked as a sub-consultant to GSRC to perform biological surveys along portions of the border fence within the Tucson Sector. Ms. Rothbard performed biological surveys along the United States and Mexico Border for T&E species including Pima pineapple cactus (*Coryphantha scheeri var robustispina*), Acuna cactus (*Echinomastus erectocentrus*

var acunensis), Chiricahua leopard frog (*Rana chiricahuensis*) and habitat for threatened and endangered bat species.

Rare Plant Survey of 6 Mow Areas for the Prescott 500kV Transmission Line Maintenance Project, Chino Valley Ranger District, Prescott National Forest, AZ. 2006:
Ms. Rothbard managed and performed a plant survey for rare and sensitive plant species in the right of way of a high voltage power line. All plant identification, vegetative habitat determination, and technical writing was performed by Ms. Rothbard. The project received funding through Arizona Public Service however all data collection was performed on the Prescott National Forest.

Rangeland Survey of the Roswell Grazing Allotment, BLM Roswell Field Office, New Mexico. 2005:
Ms. Rothbard performed plant identification, biomass determination, and species richness and diversity classification on grazing allotments in the Roswell, New Mexico area. Funding was provided by the BLM Roswell Field Office however the project was managed by Southwest Botanical Research, Chino Valley, Arizona.

Arizona State University Central Arizona Project – Long-Term Ecological Research, Phoenix, AZ. 2004-2005:
Ms. Rothbard performed arthropod collections and identification, native and non-indigenous plant identification, vegetation sampling and monitoring at over 32 sites in the Phoenix Metro Area. Funding was provided by the National Science Foundation however all work was managed and performed by the International Institute for Sustainability at Arizona State University.

Environmental Site Assessments

City of Phoenix On-Call Environmental Site Assessments and Biological Surveys. 2006:
Ms. Rothbard is assisting in numerous Phase I Environmental Site Assessments for the City of Phoenix. For these projects, the City of Phoenix has asked that AMEC include requirements of the All Appropriate Inquiry Rule into the assessments. This contract involves properties associated with Light Rail Transit, the Community Noise Reduction Program, and Tres Rios. The properties include right-of-way in urban areas, undeveloped parcels, residential parcels, and agricultural land.

Additional Experience

Bird Banding, Riverside, March 2010 (5 hours)
Birch Aquarium – Volunteer (20 hours/month), 2009-2010:
Tidepool Associate and Aquarist Assistant. Identify, handle, and maintain enclosures of Southern California coastal marine vertebrates and invertebrates.

San Diego Oceans Foundation/Hubbs Seaworld – Volunteer (8 hours/month), August 2009-Present:
White Sea Bass Restoration Project. Regular maintenance and feeding of juvenile white sea bass, in 2 pens in San Diego Bay, for release into the Pacific Ocean.

San Diego Natural History Museum – Volunteer (20 hours/month) 2009-2010:
Marine Mammal and Bird Naturalist aboard whale watching cruises. Locate and identify marine mammals, birds, and fishes during a weekly four-hour cruise.

Project Wildlife, San Diego, CA – Volunteer (40 hours/month) 2009-Present:
Raptor Rehabilitator, Care Center assistant, and bird rescue. Rehabilitate raptors at home, rescue of birds, including shore and seabirds, and general care of birds in the care center.

Specialized Training

2011/ UXO Training
2009 and 2011/ 40-hour HAZWOPER Training
2008/8-hr Refresher
2010/Yellow-billed Cuckoo Survey Training
2009/DoD Plant Conservation Workshop
2008/Wetland Delineation Training
2007/Desert Tortoise Survey and Handling Workshop
2007/Chiricahua Leopard Frog Survey Training
2007/Southwestern Willow Flycatcher Survey Training
2007/Integrated Weed Management Workshop
USFWS Biological Assessment Workshop
2006, 2007/Southwest Noxious Weed Short Course
2006/Red Brome (Bromus rubens) Grass Symposium
2006/Arizona Wildfire Academy
2005/Sahara Mustard (Brassica tournefortii) Workshop

Publications

Dierig, D.A., Tomasi, P.R., Dahlquist, G.H., Dawson, H.K*. Measurements of Lesquerella Interspecific Hybrids and Parents, Abstract, 2003.

Dierig, D.A., Rodriguez, D., Foster, M.A., Grieves, C.M., Dawson, H.K*., Rodriguez, R. Effects of Salinity on Lesquerella at Three Locations. Agronomy Abstracts, 2003.
*Dawson was Ms. Rothbard's married name at the time of publication.

Contact Information

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Sean Rowe, Senior Biologist

SUMMARY

Mr. Rowe nearly 20 years experience as a professional biologist conducting independent research in avian ecology and conservation as well as project related surveys and monitoring. He has worked with a wide variety of bird species and habitats, primarily in Southern California and Florida. This work included working with federal T&E and state listed species (Florida Scrub-Jay, Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo), including conducting surveys, locating and monitoring territories and nesting attempts, trapping, netting and banding adults and nestlings, drawing blood and feather samples.

Mr. Rowe has conducted hundreds of surveys (transect, point count, spot-mapping, call broadcast) for target species and general bird communities in all seasons and has handled (mist-netted and banded) in excess of 1000 individual birds of numerous species including federal T&E and other special status species. This work includes running/assisting with Monitoring Avian Productivity and Survivorship (MAPS) stations and three seasons of intensive winter bird banding as well as targeted mist-netting and trapping on several different projects.

In addition to my professional experience, Mr. Rowe has extensive general birding experience as a life long birder (25+ years).

EDUCATION

B.S. Zoology, University of South Florida, Tampa, FL May- 1993

PERMITS

U.S. Fish and Wildlife Service, endangered species recovery permit, Southwestern Willow Flycatcher & Least Bell's Vireo

TRAINING

Willow Flycatcher Workshop and Training Session, Southern Sierra Research Station, Weldon, CA May 2010 & 2011.
Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop, Desert Tortoise Council, Nov 2010.

DESERT FIELD ORNITHOLOGY EXPERIENCE

- Mr. Rowe has birded throughout the desert Southwest including numerous trips throughout the Mojave Desert (1992-present).
- Conducted surveys for Inyo California Towhee in the Argus and Panamint Mountains, Inyo, Co., CA. Identified and recorded all other bird species observed (Spring 2011).
- Documented bird sightings in the Alvord Mountains area, San Bernardino Co., CA while working on vegetation transects for Desert Tortoise studies (Fall 2010).
- Conducted migrant bird surveys in the northern Mojave (Indian Wells Valley & Southern Owens Valley – Fall 2009).
- Conducted surveys for Burrowing Owls throughout the Imperial Valley, CA, and birded and documented sightings throughout the region (Spring 2007).
- Mr. Rowe co-founded a long-term Turkey Vulture and raptor migration study in southern Sierra Nevada/Northern Mojave (Kern Co., CA) and spent several hundred hours documenting migrating raptors and traveling throughout the region to locate additional migratory concentration corridors (Fall 1994-1998).
- Conducted general bird surveys and targeted surveys for Yellow-billed Cuckoos along the Bill Williams River, AZ (July 1994).

ADDITIONAL FIELD ORNITHOLOGY AND BIOLOGY EXPERIENCE

2009 – present
Independent Biological Consultant

May-Aug 2011 – Quad Knopf Inc.,
- Conducted surveys for Southwestern Willow Flycatchers on Cottonwood Creek & St. Johns River, Tulare Co., CA

Spring 2011 - Eremico Biological Services
- Assisted with plant data collection in the Desert Tortoise Natural Area and Mojave Ground Squirrel trapping, Kern Co., CA
- Conducted surveys for Inyo California Towhees in the Argus and Panamint Mountains, Inyo Co., CA

Fall 2010 - Eremico Biological Services
- Assisted with plant data collection in Desert Tortoise habitat in the Alvord Mountains, San Bernardino Co., CA

Fall 2009 - Eremico Biological Services
- Conducted migratory bird surveys for proposed wind energy development in southern Owens Valley and northern Indian Wells Valley, Inyo Co., CA

Nov 2008 – present
Land Steward, Audubon California, Kern River Preserve, Weldon, CA
- Responsible for duties relating to stewardship of the Kern River Preserve, including planning and implementing riparian and upland restoration projects, developing proposals to secure funding for Audubon programs, invasive weed control, supervising contractors and volunteers, general preserve and equipment maintenance.
- Conduct point count surveys for breeding birds, survey for Southwestern Willow Flycatchers, and assist with mist netting programs on the Kern River Preserve and Canebrake Ecological Reserve along the South Fork Kern River.

Nov 2007 – Nov 2008
Environmental Engineer, Comprehensive Health Services, Inc., Kennedy Space Center, FL
- Served as the principle Environmental Point of Contact for NASA Project Managers in support of Constellation and Construction of Facilities projects.
- Provided environmental consulting expertise to NASA Project Managers and coordination between Project Managers and NASA Environmental Program Branch from project conception through construction.
- Participated in design review and pre-work meetings and reviewed designs to ensure that environmental compliance issues were identified and addressed.
- Provided construction management support by reviewing construction bid packages, participating in project status meetings, tracking project environmental requirements, conducting field inspections, and providing logistical support and guidance to construction contractors.
- Performed industrial hygiene surveys and evaluations in support of launch and payload activities including, indoor air quality, ventilation, breathing air and confined spaces.

May – Aug 2007
Research Assistant, Southern Sierra Research Station, Weldon, CA
- Participated in studies of the reproductive ecology and conservation of the Southwestern Willow Flycatcher.
- Conducted surveys, determined breeding status, located and monitored nests, conducted behavioral observations, mist-netted and banded adult & young Southwestern Willow Flycatchers.
- Conducted point counts for breeding bird species, mist-netting and banding birds and vegetation sampling.

Mar – Apr 2007
Burrowing Owl Biologist, Wildlife Research Institute, Imperial Co. CA
- Conducted surveys for Burrowing Owls along Imperial Irrigation District right-of-ways throughout the Imperial Valley, California.

Nov 1998 – Sep 2005
Environmental Scientist II, St. Johns River Water Management District, Melbourne, FL
- Responsible for overseeing large-scale (1000 – 10,000 ac.) wetland restoration projects in the Upper St. Johns River Basin in east-central Florida including development and implementation of restoration projects.
- Conducted fieldwork for a variety of research projects involving wildlife and vegetation in wetland and upland habitats.
- Conducted bird surveys to assess project impacts on bird populations.
- Maintained wildlife occurrence & ArcView GIS wildfire databases for 150,000 acres of District owned properties.
- Provided logistical support for District staff including airboats, outboard boats, GPS, ATV and 4wd vehicles.

Jan 1998 – Nov 1998
Research Assistant III, Archbold Biological Station, Lake Placid, FL
- Monitored a population of federally threatened Florida Scrub-Jays on the Avon Park Air Force Range.
- Conducted surveys and behavioral observations, mapped breeding territories & located nesting attempts, mist-netted, trapped and banded adult and nestling scrub-jays. Assisted with field studies of Red-cockaded Woodpeckers & Florida Grasshopper Sparrows.
- Mapped spatial data using ArcView and Arc/Info GIS and provided GIS support and other assistance as needed for other projects.

May 1994 – December 1997
Research Associate, Kern River Research Center, Weldon, CA
- Conducted research on the effects of riparian restoration efforts on winter bird communities.
- Developed a long-term Turkey Vulture and raptor migration monitoring program in the southern Sierra Nevada. This included extensive field experience with identification of migrating raptors in the Southern Sierra Nevada.
- Conducted field word on the reproductive ecology and conservation of Southwestern Willow Flycatchers and Yellow-billed Cuckoos and the effects of riparian restoration on breeding bird communities.
- Prepared project reports, proposals, and manuscripts for publication.
- Conducted bird surveys and behavioral observations, located breeding pairs and nesting attempts, mist-netted, trapped and banded birds and conducted vegetation sampling.

January 1993 - April 1994
Wildlife Ecologist, Bionetics Corp., Kennedy Space Center, FL
- Designed and conducted studies on patterns in avian activity as related to the bird-aircraft strike hazard and bird control operations at Kennedy Space Center's Shuttle Landing Facility.
- Monitored and provided recommendations to NASA managers on the effects of landing facility operations on a population of threatened Florida Scrub-Jays and the effects of bird control efforts and proposed projects on wildlife habitat and sensitive species.
- Conducted bird surveys, behavioral observations, mist-netting, trapping and banding Florida Scrub Jays and other bird species and vegetation sampling.

June 1992 – August 1992
Research Assistant, Kern River Research Center, Weldon, CA
- Conducted fieldwork for studies of riparian breeding bird communities including long-term studies of the Southwestern Willow Flycatcher and Yellow-billed Cuckoo.
- Surveyed for, determined breeding status, located and monitored nests, netted and banded adult and young willow flycatchers and cuckoos and other bird species.

1987 - 1991
Field Volunteer, Florida Breeding Bird Atlas, Central Florida
- Surveyed breeding bird populations in a variety of habitats throughout west-central Florida

May - Jun 1990
Research Intern, Archbold Biological Station, Lake Placid, FL
- Participated in a long-term study on the behavioral ecology the federally threatened Florida Scrub-Jay.
- Conducted bird surveys and behavioral observations, located breeding pairs and nesting attempts, mapped breeding territories, mist-netted, trapped and banded adult and young scrub-jays and conducted vegetation sampling.

PUBLICATIONS

Ponzio, K.J., S.J. Miller, E. Underwood, **S. P. Rowe**, D.J. Voltolina, and T.D. Miller. 2006. Responses of a willow (*Salix caroliniana Michx*) community to roller-chopping. Natural Areas J. 26:53-60.

Rowe, S.P. 2003. Barn Swallow (*Hirundo rustica*), Gray Kingbird (*Tyrannus dominicensis*), Northern Rough-winged Swallow (*Stelgidopteryx serripennis*), Prairie Warbler (*Dendroica discolor*), and Prothonotary Warbler (*Protonotaria citrea*), in Florida Fish and Wildlife Conservation Commission. 2003, Jan 6. Florida's Breeding Bird Atlas: A collaborative study of Florida's birdlife. http://www.myfwc.com/bba/

Whitfield, M. J., K. Enos and **S. P. Rowe**. 1999. Is Brown-headed Cowbird trapping effective for managing populations of the endangered Southwestern Willow Flycatcher? Studies in Avian Biology No. 18:260-266.

Rowe, S.P. and D.S. Cooper. 1997. Confirmed nesting of an Indigo with a Lazuli Bunting in Kern County, California. Western Birds 28:225-227.

Larson, V.L., **S.P. Rowe**, and D.R. Breininger. 1997. Temporal, spatial, and diurnal patterns in avian activity at the Shuttle Landing Facility, John F. Kennedy Space Center, Florida, U.S.A. NASA Tech. Memo. 97-206644, 43 pp.

Rowe, S.P. and T. Gallion. 1996. Fall migration of Turkey Vultures and raptors through the southern Sierra Nevada, California. Western Birds 27:48-53.

Larson, V.L., **S.P. Rowe**, and D.R. Breininger. 1995. Astronauts and avifauna sharing space. Suppl. to the Bulletin of the Ecological Society of America 76(2):151 (80th Ann. ESA Mtg, Snowbird, Utah, 30 Jul-03 Aug).

Larson, V.L., **S.P. Rowe**, D.R. Breininger and R. Yosef. 1994. A review of falconry as a bird control technique with recommendations for use at the Shuttle Landing Facility, John F. Kennedy Space Center, Florida, USA. NASA Tech. Memo. 110142, 43 pp.

PROFESSIONAL SERVICE

Member, Board of Directors, Southern Sierra Research Station, 2009 to present
Treasurer, Florida Ornithological Society 1998 – 2001

References Available Upon Request

Ryan Randall

Wildlife Biologist

Overview

Mr. Randall has three years of ecology experience, focusing primarily on California wildlife including many species of raptors in San Diego County and shorebirds in central California. He led a habitat restoration effort for coastal cactus wren for the San Dieguito River Park and has worked with several sensitive shorebird species in central California National Wildlife Refuges. Ryan Randall has worked with such federal agencies as U.S. Fish and Wildlife Service, U.S. Forest Service, and U.S. Geological Survey. Mr. Randall has many hours of raptor nest monitoring with the U.S. Forest Service. Most recently, he has performed a variety of biological surveys in the Sonoran Desert including bird point counts and focused surveys for several sensitive species including: desert tortoise, burrowing owl, Mojave fringed-toed lizard, gila woodpecker, and elf owl.

Areas of Expertise

Wildlife Surveys
Biological Monitoring
Raptor Biology

Years of Experience

With URS: 1 Year

Education

BS, Biology with concentration in Ecology, California State University, San Marcos, 2011

Project Specific Experience

Rio Mesa Solar Electric Generating Facility, 2011-Present, CA:
Organized and led elf owl surveys. Performed fall and spring bird point count surveys, desert tortoise, burrowing owl, Mojave fringed-toed lizard, Couch's Spadefoot toad, and gila woodpecker surveys. Installed Anabat bat detection systems and performed data entry and statistical analysis for this approximately 11,000-acre project near Blythe, CA.

Sonoran West Solar Electric Generating System, 2011-Present, CA:
Organized and led elf owl surveys, performed spring bird point count surveys and desert tortoise surveys. Also participated in fall rare plant surveys for this approximately 5,500-acre project near Blythe, CA.

Camp Pendleton Utility Upgrades Pre-Construction Surveys 2011, CA:
Performed pre-construction surveys for this utility upgrades project documenting existing conditions and determining jurisdictional Waters of the U.S.

State Route 76 Biological Monitoring, 2011, CA:
Performed biological monitoring in relation to impacts to federally listed species (coastal California gnatcatcher, least bell's vireo, southwestern willow flycatcher, arroyo toad) and designated critical habitat for this highway improvement project located along the San Luis Rey River Valley in unincorporated San Diego County.

Dana Point Headlands Revegetation Monitoring and Coastal California Gnatcatcher Surveys, 2011, CA:
Performed biological monitoring as part of a yearly assessment of a 25 acre revegetation project. Plant line intercept transects were used to estimate percent cover in creation and enhancement areas. Participated in coastal California gnatcatcher surveys alongside a permitted biologist (over 10 positive contact hours).

Undergraduate Research Assistant, 2011, CA:
California State University San Marcos - Dr. Tracey Brown. Lizard husbandry and digestive ecology studies including feeding trials and analyses.

U.S. Forest Service - Cleveland National Forest, 2010, CA:
Biological Technician. Raptor surveys and nest monitoring for Golden Eagles, Peregrine Falcons, and Prairie Falcons. Banding and radio tracking Golden Eagles.

Wildlife Research Institute, Intern, 2010, CA:
Hawk Watch: aiding public in raptor identification and proper use of spotting scopes. Cleveland National Forest: habitat restoration for endangered coastal California Gnatcatcher and burrowing Owl artificial burrow monitoring.

U.S. Fish and Wildlife Service, Biology Intern, 2009, CA:
Conducted Western Snowy Plover surveys (over 100 positive contact hours), shorebird banding of Caspian Tern, invasive plant control at Farallon National Wildlife Refuge, Pacific Tree Frog surveys at Ellicott Slough National Wildlife Refuge, and endangered butterfly surveys (Lange's Metalmark butterfly) and endangered plant seed collection at Antioch Dunes National Wildlife Refuge.

U.S. Geological Survey, 2009, CA:
Biology Intern. Shorebird banding and nest monitoring of Forster's Terns as part of a study on the effects of Mercury contamination in the San Francisco Bay.

San Dieguito River Park, 2009, CA:
Intern. Organized and performed habitat restoration for the coastal cactus wren in North County San Diego. Trail and irrigation systems building and maintenance. Creation and assessment of firebreaks and park patrol. Aided in invasive plant removal.

Specialized Training

Introduction to Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop, 2011
Flat Tailed Horned Lizard Biomonitoring Training, 2012

Awards

Dean's List
Golden Key International Honor Society

Contact Information

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JOHN C. STERLING, BS

Ornithologist

RELEVANT QUALIFICATIONS

Years of Experience

>25

Education

BS, Humboldt State University 1985.

Expertise

Extensive avian field survey expertise on Yellow-billed Cuckoo, Marbled Murrelet, Spotted Owl, California Gnatcatcher, Least Bell's Vireo, Southwestern Willow Flycatcher; and focused surveys for Bendire's Thrasher, Swainson's Hawk, and a host of other species

KEY QUALIFICATIONS

Mr. John Sterling has a unique blend of experience and accomplishment in avian research, resource management, environmental education and policy. Mr. Sterling is currently teaching bird identification training courses, consulting for The Nature Conservancy, Audubon Canyon Ranch, Center for Natural Lands Management, Smithsonian Institution, and the CA Rice Commission. To that end, Mr. Sterling possess authoritative knowledge of California bird distribution, status and natural history. He is also currently authoring a book on California bird status and distribution to update/upgrade Grinnell and Miller's 1944 work.

Wildlife Biologist

Kern River Research Center Riparian Bird Study

Mr. Sterling surveyed and mapped birds (including Southwestern Willow Flycatchers) and nests in riparian vegetation along the South Fork of the Kern River. Transcribed data onto large maps, documented rare and unusual bird records, and compiled report of bird sightings. Mr. Sterling also conducted protocol surveys for spotted owls in the Sierra Nevada in Tulare County as well.

Wildlife Biologist

US Forest Service Pacific Southwest Avian Research Study

Mr. Sterling surveyed and mapped breeding bird territories and mapped / measured snags in northeastern California. Trained and supervised field assistants, created database of bird sightings and published an annotated list of birds for Modoc County. Mr. Sterling also initiated research on the dynamics of bird populations in clear-cut brush fields, and rediscovered Cassin's Finch vocal mimicry and collected supporting data.

Wildlife Biologist

US Forest Service National Forest Wildlife Census Study

Mr. Sterling conducted censuses of birds, amphibians, reptiles, and mammals in northwestern California. Studies focused on nesting and foraging behavior of Hammond's and Pacific-slope Flycatchers in the Six Rivers National Forest; habitat requirements of all vertebrates during the old-growth forest project on the Six Rivers National Forest; density and habitat use of northern goshawk and its prey base in the Shasta National Forest; migration, habitat use, and social behavior of resident and neotropical migratory birds in coastal lodgepole pine forest in Humboldt County; and density and habitat requirements of Pacific giant salamander and tailed frog on the Siskiyou National Forest. Mr. Sterling is also responsible for training in bird identification, census, and bird-banding techniques.

Publications

Sterling, J. (in prep). Swainson's Hawk foraging habitat selection in central Yolo County. Central Valley Bird Club Bulletin.

Sterling, J. 2011. Review of Literature and Information on the Bird Use of Certain Agricultural Crops in California's Central Valley. The Nature Conservancy. Pp. 122.

Sterling, J. and P. Buttner. 2009. Wildlife Known to Use California Ricelands. California Rice Commission, 8801 Folsom Blvd. Suite 172, Sacramento, CA 95826. Pp. 48.

Sterling, J. 2008. Least Bittern (Ixobrychus exilis). In The Bird Species of Special Concern in California, W. D. Shuford and T. Gardali, eds. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, CA and the Department of Fish and Game, Sacramento.

——— 2008. Yellow Rail (Coturnicops noveboracensis). In The Bird Species of Special Concern in California, W. D. Shuford and T. Gardali, eds. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, CA and the Department of Fish and Game, Sacramento.

——— 2008. Bendire's Thrasher (Toxostoma bendirei). In The Bird Species of Special Concern in California, W. D. Shuford and T. Gardali, eds. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, CA and the Department of Fish and Game, Sacramento.

——— 2001. Vaux's swift (Chaetura vauxi). In California partners-in-flight coniferous forest bird conservation plan. available: http://www.prbo.org/CPIF/Conifer/VASW.html.

——— 1999. Gray Flycatcher (Empidonax wrightii). In The Birds of North America, No. 458 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

——— 1982-1986, 1989. Field Notes in Econews: monthly column on bird distribution and status in NW California.

Sterling, J and P. Paton. 1997. Breeding Distribution of Vaux's Swift in California. Western Birds 27:30-40.

Sterling, J. and K. Campbell. 1985. Middle Pacific Coast Region, American Birds vol. 39 no. 1.

Cole, L.W., K.N. Nelson, and J. Sterling. 2006. The 30th Report of the California Bird Records Committee: 2004 Records. West. Birds 37:65-105.

Greenberg, R., V. Pravosudov, J. Sterling, A. Kozlenko and V. Kontorshchikov. 1999. Forest History and the Foraging Behavior of Foliage-gleaning Birds of the Canadian and Russian Boreal Zone. Oecologia 120: 451-462.

Greenberg. R., V. Pravosudov, J. Sterling, A. Kozlenko and V. Kontorshchikov. 1999. Tits, Warblers, and Finches: Foliage-gleaning birds of Nearctic and Palearctic Boreal Forests. Condor 101: 299-310.

Greenberg. R., P. Bichier, and J. Sterling. 1997. Bird populations in rustic and planted coffee plantations in Eastern Chiapas, Mexico. Biotropica 29 (4): 501-514.

Greenberg, R., P. Bichier, and J. Sterling. 1997. Acacia, Cattle and Migratory Birds in Southeastern Mexico. Biological Conservation 80:235-47.

R. LeValley, J. Sterling, R. Erickson and K. Rosenberg. 1984. Middle Pacific Coast Region, American Birds vol. 38 no. 2.

Julie Stout

Biologist

Areas of Expertise

Wildlife Biology
Renewable Energy Projects

Years of Experience

With URS: 1 Year
With Other Firms: 6 Years

Education

BS, Biological, Science, California Polytechnic State University, 2005

Registration/Certification

N/A

Overview

Ms. Stout has over 6 years of experience conducting biological resource surveys and preparing reports. Ms. Stout conducts desert tortoise surveys, wetland delineations, wildlife surveys, and rare plant surveys. Her avian experience includes raptor nest monitoring and conducting surveys for breeding and migrating birds including western snowy plover, California least terns, western burrowing owls, and greater sage-grouse. Her mammalian experience includes acoustic and mist netting surveys for bats and radio tracking pygmy rabbits. Ms. Stout has conducted critical issues analyses for renewable energy projects throughout southern California and prepared environmental permitting documents including Biological Assessments, Environmental Assessments, Environmental Impact Reports, and Environmental Impact Statements.

Project Specific Experience

Federal

San Clemente Island Fuel Storage and Transfer Pipeline, CA. Conducted surveys for rare plants and migrating birds along a fuel pipeline route. Prepared a Biological Assessment and the biological resources section of an Environmental Assessment for the project.

Naval Hospital Camp Pendleton, CA. Prepared a worker education brochure to comply with a biological opinion for impacts to the coastal California gnatcatcher. Conducted construction monitoring to ensure compliance with the gnatcatcher biological opinion and ensure a water of the U.S. and vernal pool on site were not being impacted. Conducted breeding bird surveys prior to clearing and grading in vegetated areas to prevent violations of the Migratory Bird Treaty Act.

Naval Base Coronado and Point Loma BRAC EA, CA. Prepared the biological resources sections for Base Realignment and Closure Environmental Assessments. Resources of concern included California least terns, western snowy plovers, and Essential Fish Habitat.

Chocolate Mountain Aerial Gunnery Range. Prepared a Biological Opinion for impacts to desert tortoises due to military training activities at a training area in the northern portion of CMAGR. Participated in a cultural resource survey for this project.

BLM West Chocolate Mountain Geothermal Lease. Prepared the special status plants existing conditions section of the Programmatic Environmental Impact Statement.

Environmental Protection Agency Circuit Rider Program. Involved in learning program to improve water treatment systems at Indian Reservations in southern California.

Energy Projects

Meteorological Tower near Beatty, Nevada, CA. Installed acoustic bat monitoring and conducted ongoing maintenance and data gathering.

Meteorological Tower near Barstow, CA. Conducted surveys for rare plants and desert tortoises at two meteorological tower sites. Conducted construction monitoring for desert tortoise for the installation of two meteorological towers. Prepared the biological resources section of an Environmental Assessment.

Ruby Pipeline in Oregon, Nevada, and Utah. Conducted stream and wetland delineations, habitat and biotic soil crust mapping, breeding bird surveys, noxious weed survey and mapping, electrofishing and salvage for Lahontan cutthroat, raptor nest monitoring, and pygmy rabbit radio tracking.

Wind Project near Big Timber, Montana. Conducted a habitat assessment, acoustic bat monitoring, and completed acoustic bat data analysis and report.

Aliso Canyon Gas Storage Project, CA. Assisted in preparation of the biological resources section of the Environmental Impact Report.

Solar Energy Projects in Kern, Monterey, and San Luis Obispo counties, CA. Conducted a habitat assessment survey and prepared a survey report and critical issues analysis.

California Public Utilities Commission Ivyglen Transmission Line, CA. Biotechnical report third party review and assisted in preparation of the biological resources existing conditions EIS/EIR section.

Solar Sites in Los Angeles County near Lancaster, CA. Conducted habitat assessment and prepared biological critical issues analysis report.

Salmon River Wind Project. Conducted greater sage-grouse lek count surveys.

Recurrent Solar Projects, Kern County, CA. Conducted habitat assessment, wetland delineation, rare plant surveys, and burrowing owl surveys.

Mineral Mountains, Utah. Conducted noxious weed surveys.

Iberdrola Meteorological towers near Las Vegas, Nevada. Conducted desert tortoise presence/absence surveys.

Ohio Wind Farm. Preconstruction bat mist netting for Indiana bats.

Energia Sempra Juarez Transmission Line. Conducted habitat assessment survey and prepared survey report.

Solar Project near Tucson, AZ. Conducted native plant inventory survey.

Pattern Energy Ocotillo Express Wind Project. Conducted burrowing owl surveys for meteorological tower installation

Ormat, Orni 21 Geothermal Project, Imperial County, CA. Conducted burrowing owl surveys for geothermal well pads.

Kern River Gas Pipeline, CA. Conducted revegetation monitoring using linear sampling.

Contact Information

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Jesse Swift
Lead Biologist

EDUCATION
B.S. Biology, 2002, University of Central Florida, Orlando
A.A. Natural Science, 2000, Saint Petersburg College, St. Petersburg

CERTIFICATIONS &TRAINING
USFWS Authorized Desert Tortoise Biologist in NV, CA, and UT
NDOW Special Purpose Permit for Desert Tortoises and Gila Monsters
UW - Sage Grouse Lek Monitoring
First Aid and CPR
Wildland Firefighter Type 2

EMPLOYED AT SNEI
1 Year 3 Months

YEARS AS PROFESSIONAL BIOLOGIST
7+ Years

PROFESSIONAL RESPONSIBILITIES

- Provide Endangered Species Act Section 7 and Section 10 compliance consultations and perform mitigation actions as necessary.
- Coordination with the Agencies, the Contractors and the project proponent to ensure project-wide compliance with the protective measures stated in the biological opinion.
- Oversee daily project activities and manage logistics to ensure the activities and staffing levels are in accordance with the Biological Opinion.
- Work directly with the contractor to find appropriate solutions to project problems and the strategies to implement the solutions.
- Manage and mobilize teams of authorized biologists to meet our clients ever changing needs.
- Write project status reports for clients and overseeing agencies.
- Participate in desert tortoise clearances and surveys.
- Perform Biological Surveys for threatened, endangered and sensitive species (federal and state-listed species of concern).
- Provide Migratory Bird Treaty Act compliance consultations and perform mitigation actions as necessary.

PROFESSIONAL EXPERIENCE

- Perform Section 7 and Section 10 mitigation in accordance with the protocols set forth by USFWS Biological Opinions and Habitat Conservation Plans.
- Monitor of desert tortoises and sensitive biological and botanical species during development projects.
- Perform site inspections and characterizations.
- Perform Zone of Impact and Zone of Influence surveys and clearances for desert tortoises.
- Ability to locate and document all signs of the desert tortoise including: nests, scat, tracks, burrows, dens, courtship rings, drinking sites, carcasses, and shell and egg fragments.
- Perform inspections of desert tortoise exclusionary fencing.
- Ability to use a probing camera to effectively excavate animal burrows.
- Able to use a dichotomous key to identify unrecognizable flora and fauna of the southwest, southeast, northeast, and northwest USA.
- Conduct native plant inventories and surveys for sensitive plant species.
- Conducted surveys for noxious/invasive weeds for Weed Risk Assessments and Weed Management Plans.
- Provided Desert Tortoise worker education programs.

- Conducted multi-species avian point counting and observation of birds across a wide range of habitats to help guide forest management practices in the ecologically significant southern Cascade Mountains.
- Performed broadcast vocalization surveys for mountain quail (*Oreortyx pictus*), hairy woodpeckers (*Picoides villosus*), and flammulated owls (*Otus flammeolus*) in the southern Cascade Mountains.
- Conducted avian point-counts and searched for the endangered ivory-billed woodpecker (*Campephilus principalis*) in bottomland hardwood forests of northern Florida.
- Performed research in northern California which included early morning double observer bird point-count surveys, area-constrained searches (nest searching via behavioral observation), gill netting for salmonids, frog and garter snake mark and recapture surveys (pit-tagging), emergence trap and sticky trap surveys for terrestrial and aquatic insect sampling, odonate exuvia surveys, evening bat surveys, and anabat II bat detector maintenance.
- Performed avian bird point-count surveys for pileated woodpeckers (*Dryocopus pileatus*), a management indicator species in National Forests of Idaho.
- Performed avian broadcast vocalization surveys species included pileated woodpeckers, northern goshawks (*Accipiter gentilis*), and flammulated owls in the mountains of central Idaho.
- Performed radio-telemetry demographics research on the Osceola wild turkey (*Meleagris gallopavo osceola*) in central Florida.
- Performed vegetation plots in central Florida's pine flatwood, dry prairie, and wet prairie habitats.
- Performed radio-telemetry demographics research on the greater sage grouse (*Centrocercus urophasianus*) in northwestern Wyoming.
- Construction, installation, sampling of drift fences and drops bucket traps, and salamander traps in pine flatwood habitat of central Florida.
- Performed electrofishing surveys searching for the presence of endangered bull trout (*Salvelinus confluentus*) in high elevation mountain streams of Central Idaho.
- Performed a mark and recapture study of Chinook (*Onchorhyncus tsawathya*) and Coho (*Onchorhyncus kisutch*) Salmon via coded wire tags and adipose fin removal in a remote camp setting on the Chickamin River, a management indicator watershed located in the Misty Fjords National Wilderness, Alaska.
- Monitored a captive population of mule (*Odocoileus hemionus*) and black-tailed (*O. h. columbianus*) deer to study the effects of an introduced species of louse (*Damalina cervicola*), the cause of an exotic disease known as "deer hair-loss transmission syndrome" in the Pacific Northwest.
- Performed line-transect surveys in a dense/wet sub-boreal spruce/fir forest quantifying snowshoe hare (*Lepus americanus*) pellets to determine hare-lynx (*Lynx* canadensis) demographics in central Maine.
- Collected garter snake (*Thamnophis sirtalis parietalis*) blood to ascertain the effects of melatonin and steroid levels on hibernation behavior in a controlled research hibernation chamber.
- Surveyed conifer trees in Experimental Conifer Forests throughout Oregon's Coastal and Cascade mountain ranges measuring height, depth at breast height, radii, and basal diameter.
- Ability to determine migration patterns and demographic information for a gopher tortoise (*Gopherus polyphemus*) population via monitoring burrows and categorized them as active, inactive, or abandoned.
- Actively birdwatching since 2000. North America & Hawaii Lifelist: 536 species. International Lifelist: 473 species. Total avifauna species seen worldwide: 1009.

SNEI PROJECT EXPERIENCE

- ***UNEV Pipeline*** –Project Lead/AB – Provide ESA Section 7 desert tortoise mitigation, responsible for coordinating with the agencies to ensure compliance with the B.O., overseeing compliance with protective stipulations for listed species, desert tortoise worker education presentation, coordination and mobilization of biologists to meet the client's needs, attend project meetings; St. George, UT to Apex, NV (9/2010 – present).
- ***VEA Stirling Mountain to Northwest Transmission Line*** –Biologist II/AB – Provide ESA Section 7 desert tortoise mitigation, desert tortoise surveys and clearances, construction monitoring, desert tortoise worker education presentation, attend project meetings; Johnnie, NV to N. Las Vegas, NV (10/2010 – present).
- ***C&S Companies, Wildlife Hazard Assessment for McCarran International Airport*** – Biologist II - Conduct avian point count surveys, provide vegetation surveys, and collect field camera data for small birds and mammals encroaching on the Air Operational Area, assess wildlife hazard to operation of aircraft; Las Vegas, NV (11/2010 – 4/2011).
- ***KRGT Mountain Pass*** – Biologist I - Provide ESA Section 7 desert tortoise mitigation, desert tortoise survey; Ivanpah, NV (10/2010).
- ***Apex Reinforcing Area*** – Biologist I - Provide ESA Section 7 desert tortoise mitigation, desert tortoise survey and clearance; Primm, NV (10/2010).

SNEI USFWS PROJECT APPROVAL

- Stirling to Northwest project (File no. 1-5-07-F-456)
- UNEV Pipeline Project (File no. 84320-2011-TA-0351 and 6-UT-09-F-023)
- Kern River Gas Transmission Project in Nevada, California, and Utah (File no. 1-5-02-F-476)
- NV Energy (File nos. 1-96-F-023R and 1-5-97-F-251)

RELEVANT QUALIFICATIONS

Years of Experience
13

Education
MS California State University Sacramento 1999

BS, Saint Mary's College 1998

Expertise
Natural History of Sparrows, and California's Birds of Prey.

KEY QUALIFICATIONS

Mr. Brain Williams is an experienced ornithologist and researcher. Mr. Williams is an Adjunct Professor of Biology and currently teaches field courses on the identification and Natural History of sparrows, and California's birds of prey.

Wildlife Biologist

Placer Legacy Oak Woodland Research Study

Mr. Williams designed, researched and sampled the effects of urbanization on breeding birds in foothill oak woodlands. Mr. Williams performed extensive point counts, and coordinated access with over 50 private property owners.

Wildlife Biologist

Purple Martin Conservation Project

Mr. Williams conducted purple martin research through the Tehachapi's to assess habitat selection of purple martins in oak woodlands. Mr. Williams' efforts included study design, field sampling and statistical analysis.

Wildlife Biologist

Plumas National Forest Avian Study

Mr. Williams conducted forest-wide broadcast surveys to determine avian occupancy of riparian meadows. Mr. Williams also surveyed and assessed Northern Goshawk and Great Gray Owl populations.

Wildlife Biologist

Del Webb Project

Mr. Williams conducted pre-construction surveys for nesting raptors and special-status species including Swainson's hawks (*Buteo swainsoni*), tricolored blackbirds (*Aegelaius tricolor*), and heron rookeries. Passively relocated a burrowing owl (*Athene cunicularia*) as well.

Wildlife Biologist

Pacific Gas and Electric Nortech Transmission Line Project

Mr. Williams surveyed for tower, tree, and grassland-nesting raptors along an over 60 mile transmission line corridor.

Publications

Airola, Daniel A., and Brian D. C. Williams. 2008. Purple Martin. Pgs. 293-299 *in* Shuford, W.D., and Gardali, T., eds. Bird Species of Special Concern in California. California Department of Fish and Game, Sacramento, CA.

Williams, Brian D. C. 2002. Purple Martins in oak woodlands. Pgs. 323-334 *in* Standiford, Richard B., Douglas McCreary, and Kathryn L. Purcell, tech. coords. Proceedings of the fifth symposium on oak woodlands: oaks in California's changing landscape. Gen. Tech. Rep. PSW-GTR-184. 22-25 October 2001, San Diego, CA. USDA Forest Service, Pacific Southwest Research Station, Albany, CA.

Stralberg, Diana, and Brian D. C. Williams. 2002. Effects of residential development and landscape composition on the breeding birds of Placer County's foothill oak woodlands. Pgs. 341-366 *in*

Standiford, Richard B., Douglas McCreary, and Kathryn L. Purcell, tech. coords. Proceedings of the fifth symposium on oak woodlands: oaks in California's changing landscape. Gen. Tech. Rep. PSW-GTR-184. 22-25 October 2001, San Diego, CA. USDA Forest Service, Pacific Southwest Research Station, Albany, CA.

Williams, Brian D. C. 2001. Low-elevation nesting by Calliope Hummingbirds in the western Sierra Nevada foothills. Western Birds 32: 127-130.

Initials	Name
BL	B. Latta
BW	Brian Williams
CHM	Catherine MacGregor
CM	Clark Mahrdt
ED	Eric Dugan
HR	Heather Rothbard
IK	Ingrid Klongland
JAS	Julie Stout
JK	John Konecny
JLL	Jeff Lincer
JS	John Sterling
JSw	Jesse Swift
KR	Kathryn Riley
MB	Matt Brady
PH	Phillip Howard
PLH	Patrick Hord
RAB	Rick Bailey
RO	Renee Owens
RR	Ryan Randall
SLK	Stefanie Krantz
SMR	Steve Ritt
SR	Sean Rowe
Zor	Zach Ormsby

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *RIO MESA SOLAR*
ELECTRIC GENERATING FACILITY

DOCKET NO. 11-AFC-04
PROOF OF SERVICE
(Revised 8/14/12)

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DECLARATION OF SERVICE

I, Kathleen McDowell, declare that on September 26, 2012, I served and filed a copy of the attached document Spring 2012 Migratory Bird Survey Summary Report dated September, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: **http://www.energy.ca.gov/sitingcases/riomesa/index.html**.

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(*Check all that Apply*)

For service to all other parties:

____ Served electronically to all e-mail addresses on the Proof of Service list;

_X_ Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses marked ***"hard copy required"** or where no e-mail address is provided.

AND

For filing with the Docket Unit at the Energy Commission:

____ by sending electronic copies to the e-mail address below (preferred method); ***OR***

____ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-04
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.ca.gov

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

____ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
michael.levy@energy.ca.gov

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original Signed By
Kathleen McDowell

*indicates change