URS

August 17, 2012

Pierre Martinez
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California Energy Commission
1516 Ninth Street, MS-15
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Subject: Applicant's Supplemental Response #8 to CEC Staff Data Request Set 1A (DR 49)
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 Supplemental Response #8 to CEC Staff Data Request Set 1A (DR 49) – 2012 Elf Owl Report.

Sincerely,

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

Enclosure

cc: POS List
Project File

REPORT

2012 ELF OWL REPORT FOR THE RIO MESA SOLAR ELECTRIC GENERATING FACILITY RIVERSIDE COUNTY, CALIFORNIA

Prepared for

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URS Project No. 27652103

August 2012

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BCC	Bird of Conservation Concern
BWR NWR	Bill Williams River National Wildlife Refuge
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CNDDB	California Natural Diversity Data Base
db	Decibels
GBBO	Great Basin Bird Observatory
GIS	Geographic Information Systems
ha	Hectares
LCRMSCP	Lower Colorado River Multi-Species Conservation Plan
MWD	Metropolitan Water District
Project	Rio Mesa Solar Electric Generating Facility
REAT	Renewable Energy Action Team
URS	URS Corporation
USFWS	U.S. Fish and Wildlife Service

SECTION 1 INTRODUCTION

1.1 SUMMARY OF FINDINGS

Three focused Elf Owl (*Micrathene whitneyi*) surveys on the proposed Rio Mesa Solar Electric Generating Facility (the "Project") were conducted between March 26, 2012 and June 7, 2012 based on the U.S. Fish and Wildlife Service (USFWS) Cactus Ferruginous Pygmy-Owl protocol (USFWS 2000), with state and federal wildlife agency Renewable Energy Action Team (REAT)-approved modifications (Martinez 2012) as discussed below. Two Elf Owls were aurally detected at two locations on April 15, 2012. No Elf Owls were detected during five follow-up surveys in the vicinity of the initial detections or during multiple previous and subsequent surveys in other locations. These results, and the generally poor habitat for the species that is characteristic of the survey area, indicate that the Elf Owls detected on April 15 were not nesting or engaged in a persistent nesting attempt and were most likely migrants passing through the site.

1.2 INTRODUCTION

This report summarizes the methodology used by BrightSource Energy, Inc. (Applicant) and its environmental consultant, URS Corporation (URS) to conduct Elf Owl surveys for the proposed Project and the results of the surveys. The REAT, comprised of representatives from the California Energy Commission (CEC), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and the U.S. Bureau of Land Management (BLM), requested that three rounds of Elf Owl surveys be conducted in the microphyll woodland within the Project area, and that the study area include a one-mile buffer around the solar facility fenceline. The study area for the surveys is depicted in Figure 2 and includes the approximately 3,805-acre proposed Project, the area of BLM-managed land north of the proposed Project that was removed in the Applicant's Environmental Enhancement Proposal filed with the CEC in July 2012, and a one and ½ mile buffer zone around these areas. After discussions between Dr. John Boone (Great Basin Bird Observatory) and URS biologists, the Cactus Ferruginous Pygmy-Owl protocol was modified to be more appropriate for conducting Elf Owl surveys, and the buffer zone was modified to ½-mile to reflect the typical size of an Elf Owl home range. The REAT agencies approved the buffer size and other survey protocol changes on April 24, 2012 (Martinez 2012).

The Elf Owl's current range extends northward to portions of southern California, southern Arizona, New Mexico, and southern and western Texas (Halterman 1987). In California, which comprises the western edge of the species breeding range, Elf Owls are distributed primarily along the Lower Colorado River Valley, where they are usually found in riparian woodlands or immediately adjoining habitats, such as mesquite thickets and bosque. All available information suggests that floodplain-associated breeding is by far the most commonly observed pattern in this area. Historical sightings have also been reported in desert oases over 40 miles west of Blythe, California (CDFG 2012).

Habitat conditions in the study area include microphyll woodlands with sparsely scattered palo verde (*Parkinsonia florida)* and ironwood (*Olneya tesota*) trees. URS performed vegetation mapping within the Project boundary in 2011. Initial desktop mapping was conducted using Geographic Information Systems (GIS) and high-resolution aerial photography (VTN 2011). Once the desktop mapping was completed, a team of four URS biologists field-verified the extent and types of vegetation during follow-up surveys of

the Project site and buffer areas. Mapping of microphyll woodland habitat extending from the 2011 Project boundary to the edge of the study area (the one mile buffer area depicted in Figure 2) was conducted using high-resolution aerial photography and verified during the Elf Owl field surveys.

Elf Owls in the western part of their breeding range are most commonly found in habitats characterized by high stem densities of saguaros, cottonwoods, or mesquite, usually in or near floodplains. No recent records of breeding in arid microphyll woodlands are known in this region. Only a small portion (approximately 250 acres) of the more densely vegetated microphyll woodland in the study area could provide marginally suitable habitat for nesting Elf Owls. In contrast to habitat conditions within the study area, riparian areas with higher stem densities of mature trees provide more suitable nesting cavities (indicated by the increased prevalence of primary-cavity nesting birds), and also support a more stable and prevalent prey base for the species. Elf Owls are more widely distributed and abundant outside of California and have never been thought to be exceptionally abundant in California due to their restricted distribution within the state. The statewide Elf Owl population has suffered from habitat loss and degradation (Gould 1987), and the species was listed as endangered by the CDFG in 1980. The Elf Owl is also listed as a Bird of Conservation Concern (BCC) by USFWS. The species' decline in California has been attributed to agricultural irrigation and the invasion of salt cedar (*Tamarix spp.)* in its primary habitat within and adjacent to riparian areas, and habitat restoration efforts have been initiated along the lower Colorado River (LCRMSCP 2004). Elf Owls have been observed hunting small lizards, but their main diet consists of arthropods captured while in flight (Ligon 1968). They typically hunt from a perch overlooking open habitat. Elf Owls arrive in California by March, and their breeding period extends from April to mid-July (Gould 1987). Unless depredated early in the breeding season, Elf Owls typically have only one brood. This is based largely on the length of the incubation and young rearing stages, approximately 24 days and 28-33 days, respectively (Ligon 1968).

URS completed three rounds of Elf Owl surveys between March 26, 2012 and June 7, 2012 within the microphyll woodland habitat present within the Project fenceline, including areas to the north that are no longer included in the proposed Project. A one-mile buffer extending outward from the fenceline was also surveyed from the commencement of surveys until April 24, when a reduced buffer of ½-mile was approved by the REAT agencies for the remainder of the three survey rounds (Martinez 2012). A complete description of the methodology utilized to conduct the Elf Owl survey is included in Section 3 of this report. Time, date, and weather condition information observed during the surveys is provided in Appendix A of this report.

SECTION 2 PROJECT DESCRIPTION

The Project site is 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 Project site is located solely on private land owned by the Metropolitan Water District (MWD), although the gen-tie line, 33kV service line, and access road for the project crosses land administered by the BLM. At the time when the Elf Owl surveys were initiated in March 2012, the proposed Project included three solar concentrating thermal power plants each with a single solar power tower, shared common areas, a switchyard, a gas metering yard, a temporary construction logistics area, the ROW corridor and a fenceline that would be constructed around the site. In July 2012, the Applicant filed an Environmental Enhancement Proposal with the CEC that reduced the proposed Project to two solar concentrating thermal power plants. This amendment removed the northern portion of the original site from the current Project area. The area removed from the proposed Project is depicted as the "Additional Area of Original Fenceline Boundary" in Figures 2 and 3. The study area included the proposed Project area, the area of the original fenceline, and a buffer surrounding these areas.

The study area for Elf Owl surveys focused on microphyll woodland habitat. The original survey scope included a one-mile buffer from the fenceline boundary as originally proposed by the Applicant, and this area was surveyed during most of the first survey round conducted between March 26, 2012 and April 28, 2012. A ¼-mile buffer was used for the transmission line corridor. The total acreage of microphyll woodland within these buffers surveyed in the first survey round was approximately 3,952 acres (3,823 acres within the one-mile fence-line buffer and 129 acres within the ¼-mile transmission-line buffer). As discussed in Section 1.2, the one-mile fenceline buffer was reduced to ½-mile to better reflect the biology of the Elf Owl. This adjustment was implemented following discussions between Dr. John Boone of the Great Basin Bird Observatory and URS and after approval by the REAT agencies on April 24 (Martinez 2012). The total acreage of microphyll woodland within the adjusted buffer used in Elf Owl surveys conducted after April 24, 2012 was approximately 2,852 acres (2,723 acres within the ½ mile fenceline buffer and 129 acres within the ¼-mile transmission line buffer).

SECTION 3 METHODOLOGY

The REAT agencies requested that URS conduct the Elf Owl survey by using the survey protocol for the Cactus Ferruginous Pygmy-Owl (*Glaucidium brasilianum cactorum*) developed by the Arizona Game and Fish Department and USFWS (USFWS 2000) because a standard survey protocol for Elf Owl has not been adopted by state or federal wildlife agencies. To refine the survey protocol to more accurately reflect the biology of the Elf Owl, URS contacted Dr. John Boone of Great Basin Bird Observatory, who recently developed a survey protocol for Elf Owls and who has extensive experience with Elf Owl surveys in the Lower Colorado River Valley. Dr. Boone suggested several modifications to the Cactus Ferruginous Pygmy-Owl protocol in order to be more appropriate for the Elf Owl. The modifications included: allowing for increased spacing between broadcast stations; decreased playback and listening duration at each station; and altered survey timing (see details below). The REAT agencies approved these modifications on April 24, 2012 (Martinez 2012). As discussed above, the buffer survey area was also modified from one-mile to ½ mile to better reflect Elf Owl biology and behavior.

Three full-coverage surveys were conducted in all microphyll woodland habitat within the study area from March 26 to June 7, 2012 (see Table 1). Successive survey rounds were conducted in the same areas of the study area after a minimum of 15 days had passed. Call broadcast stations were arrayed in or adjacent to microphyll woodland habitat and provided complete coverage of potentially occupied habitat in the study area (see Figures 2 and 3). Five follow-up surveys using call-broadcast stations were conducted in the vicinity of an April 15 Elf Owl detection on April 16, April 19, May 5, May 22, and June 7, three of which were conducted as part of a standard survey round.

Table 1.
Survey Schedule During Three Rounds of Elf Owl Surveys

Survey Round Number	Start	End
1	26-Mar	28-Apr
2	29-Apr	14-May
3	22-May	7-Jun

The Cactus Ferruginous Pygmy-Owl protocol was used to conduct the surveys from March 26 to April 5. Under this protocol, surveys were conducted from 1 hour before sunrise to 2 hours after sunrise, and from 1 hour before sunset to 1 hour after sunset. Under this protocol, surveys could also be conducted throughout the night during a full or nearly full moon (two days either side of a full moon) while the moon was visible. Surveys were not conducted under adverse weather conditions such as rain or wind over 12 miles per hour (mph). Call stations were spaced approximately 150 meters apart and a 2-minute listening and acclimation sequence was initiated at each station. The call sequence consisted of a 30-second playback recording (speaker volume of 65-70 decibels (db) measured 1 meter from the speaker) followed by a 90-second listening and observation period. This call sequence was repeated 5 times and was followed by a 1-minute listening period at each station.

The field surveys were conducted by teams of two biologists. Aside from enhancing survey safety, working in pairs aided the survey by allowing one surveyor to take data while the other played broadcast calls. A sample Elf Owl survey form is provided in Appendix C of this report. When more than one team was conducting surveys on the same night, teams were spaced at least one mile apart throughout the survey period. This spacing was adopted in an effort to avoid false positives between survey teams (surveyors mistaking another surveyor's broadcast call for an Elf Owl). The strategy for the majority of the full coverage surveys consisted of survey teams following major washes containing microphyll woodland habitat within the site that would most likely be used by Elf Owls if present. This method provided complete coverage of all microphyll woodland habitat. All Round 1 broadcast stations are shown on Figure 2. As discussed above, certain broadcast stations were placed in the one-mile buffer surrounding the proposed solar facility fenceline during round 1 of the survey.

Several protocol changes were implemented on April 6, 2012, and the size of the survey area buffer was modified to 1/2 mile after April 25, 2012, to better reflect Elf Owl biology and behavior as outlined in a letter by URS and Dr. John Boone to the REAT agencies docketed by the CEC on April 18, 2012 (Boone and Carroll 2012). The revised protocol was approved by the REAT agencies on April 24 (Martinez 2012) and was based on 2010-2011 Elf Owl research conducted by Dr. John Boone of the Great Basin Bird Observatory (GBBO) at the Bill Williams River National Wildlife Refuge (BWR NWR) in Arizona in support of the Lower Colorado River Multi-Species Conservation Plan (LCRMSCP). The revised protocol was utilized until the conclusion of the Elf Owl surveys on June 7, 2012. Changes to the initial survey protocol included the following modifications:

- Surveys were conducted from twilight until 5 hours past twilight (starting on April 6).
- Call station spacing was increased from 150 meters to 400 meters, and additional 2-minute intermediate listening stations were located between the primary call stations, where practicable (starting on April 6).
- A 6-minute broadcast station protocol was adopted (starting on April 6).
- The fenceline buffer was modified to ½ mile (starting on April 25).

These changes to the Cactus Ferruginous Pygmy-Owl protocol were implemented based on site conditions, life history, and behavior of the Elf Owl. Survey timing changes were implemented to more closely reflect the species' nocturnal behavior. Timing was changed from crepuscular surveys to evening surveys ranging from twilight until 5 hours after twilight. The portion of the pygmy-owl protocol allowing extended survey hours on or near a full moon was retained in the amended protocol. Most nightly surveys were conducted within a 5-hour survey period. Those that exceeded 5 hours were conducted under or near full moon conditions, and were completed by 01:00 hours.

Changes to the spacing and duration of time spent at call stations were made based on Elf Owl response rates, timing, distances, and site conditions documented by Dr. John Boone at the BWR NWR. Dr. Boone and the GBBO research team documented that for Elf Owls that responded to recorded vocalizations, approximately 88% of these individuals responded within two minutes of the initiation of the call broadcasts, and 95% responded within three minutes of call broadcasts (Boone and Carroll 2012). The GBBO researchers further documented high response rates at distances up to 250 meters in unobstructed

conditions such as open habitat with low density vegetation. As conditions within the survey area were unobstructed, GBBO recommended that the Elf Owl survey call stations be spaced 400 meters apart to allow for sufficient overlap within the effective zone of the broadcast calls.

Two-minute intermediate listening stations were recommended and implemented as an additional measure to increase the likelihood of detection. These two minutes were borrowed from the final listening period at the previous broadcast station. When surveyors reached the final call station in a survey area (generally at the edge of the buffer boundary or at the end of a linear wash), an additional two minute listening period was conducted at the primary call station. Where practicable, call stations were staggered between survey rounds so that a previous round's call stations would effectively function as intermediate listening stations during subsequent rounds (see Figure 3). This method was adopted to ensure that the Elf Owl calls were not broadcast from the same locations during all three survey rounds and to increase the likelihood of species detection.

The buffer area was modified to reflect GBBO research findings documenting Elf Owl home range sizes for two males of approximately 8 hectares (ha) to 14 ha and a species "core" home range of approximately 3-5 ha. In reviewing the survey approach, the GBBO research team recommended that the one mile buffer around the fenceline be reduced to reflect the species' documented home range size. The revised buffer was implemented in the surveys after REAT agency approval on April 24 (Martinez 2012).

SECTION 4 BIOLOGISTS' QUALIFICATIONS

All surveyors possessed the following qualifications:

- All individuals conducting the Elf Owl surveys possessed a Bachelor of Science or higher college degree in biology or a suitable level of applicable avian survey experience, and the ability to identify birds visually while in flight as well as by their call. The resumes of the Elf Owl survey team are attached to this report in Appendix B.
- Most of the individuals conducting the surveys had significant experience with conducting either Elf Owl or Cactus Ferruginous Pygmy-Owl surveys. The more experienced surveyors generally functioned as the leaders of each two-person survey team.

SECTION 5 RESULTS

This section presents the results of the three Elf Owl survey rounds conducted during 45 survey-days from March 26, 2012 to June 7, 2012. Two Elf Owls were aurally detected during the thirteenth survey-day of the first survey round on April 15, 2012 within the study area by Scott Carroll and Ryan Randall (see Figure 2; resumes for the researchers are included in Appendix B). These two individuals were detected over an approximately 30-minute period from 21:56 hours to 22:20 hours. After April 15, 2012, no Elf Owls were detected during the remainder of the first survey round (April 16 to April 28), during the entirety of the second and third survey rounds (April 29 to May 14 and May 22 to June 7, respectively), and in five follow-up surveys conducted near the detection location.

Survey conditions at the time of the April 15 Elf Owl detection were mild, and consisted of 0-1 mph winds, 21.4 C (70.5 F) temperature, and 0% cloud cover. The first individual was heard making the typical high-pitched call and chatter calls, which closely mimicked the playback recording. The response was heard during the second 30-second broadcast sequence at 21:56 hours. This individual continued to call for approximately 30 seconds. After several attempts to call the individual closer, the surveyors proceeded 200 meters northeast in the direction of the detected call. A second individual was aurally detected approximately 400-500 meters east of this location at approximately 22:20 hours after 10 seconds of playback calling. The first individual was simultaneously heard calling 400-500 meters northeast of the same location. Both individuals stopped calling after approximately 30 seconds. After waiting several minutes for calling to recommence, the surveyors proceeded east several hundred meters and conducted an entire call broadcast sequence at 22:43 hours. After hearing no response during this sequence the surveyors again proceeded east and continued to survey until 23:52 hours. No further calling was detected. The April 15 detection record has been submitted to the California Natural Diversity Data Base (CNDDB) and is attached as Appendix D to this report. No Elf Owls were detected during any other survey periods within the survey area, including the remaining duration of the first round from April 16 to April 28, 2012, the second survey round from April 29 to May 14, the third survey round from May 22-June 7, and in follow-up surveys near the detection locations.

5.1 FOLLOW-UP SURVEYS CONDUCTED IN THE VICINITY OF DETECTION AREA

Follow-up surveys in the area of the April 15 detections were conducted on five separate dates in an effort to further characterize the presence of the two detected individuals. No Elf Owls were detected during these follow-up surveys. The first return visit was conducted as part of the first survey round on April 16 by Scott Carroll and Ryan Randall (see the surveyor resumes included in Appendix B of this report), the night after the initial detection. Conditions on this evening consisted of 0-3mph winds, 25.7-21.4 C (78.3-70.5 F) temperature, and 5% cloud cover. The area several hundred meters north of the detection locations was surveyed using regularly spaced (400 meter) broadcast stations. Surveys were conducted for approximately four hours (from 19:10 to 23:11) in the vicinity of the April 15 detections. The surveyors also searched the detection area during the daytime to determine whether nesting cavities might exist in the microphyll woodlands located in the area. No Elf Owls or likely nesting cavities were detected during this survey. A second return visit, conducted by Dr. John Boone and Dorothy Crowe (see the surveyor resumes included in Appendix B of this report), was conducted on April 19, four days after the April 15 detection. Conditions were mild, consisting of 0-2mph winds, 31.6-26.1 C (88.9-79.0 F) temperature, and

Table 2.
Bird Species Incidentally Detected During Three Rounds of Elf Owl Focused Surveys

Common Name	Scientific Name	Special Status
American Kestrel	*Falco sparverius*	
Owls	Order Strigiformes	
Great Horned Owl	*Bubo virginianus*	
Other Non-Passerines		
Chicken-like Birds	Order Galliformes	
Gambel's Quail	*Callipepla gambelii*	
Doves	Order Columbiformes	
Mourning Dove	*Zenaida macroura*	
White-winged Dove	*Zenaida asiatica*	
Nightjars and Relatives	Order Caprimulgiformes	
Lesser Nighthawk	*Chordeiles acutipennis*	
Common Poorwill	*Phalaenoptilus nuttallii*	
Woodpeckers and Relatives	Order Piciformes	
Ladder-backed Woodpecker	*Picoides scalaris*	
Passerines		
Songbirds	Order Passeriformes	
Ash-throated Flycatcher	*Myiarchus cinerascens*	
Brown-crested Flycatcher	*Myiarchus tyrannulus*	WL
Western Kingbird	*Tyrannus verticalis*	
Loggerhead Shrike	*Lanius ludovicianus*	BCC, SSC
Phainopepla	*Phainopepla nitens*	
Cactus Wren	*Campylorhynchus brunneicapillus*	
Verdin	*Auriparus flaviceps*	
Black-tailed Gnatcatcher	*Polioptila melanura*	
House Finch	*Carpodacus mexicanus*	
Yellow-rumped Warbler	*Dendroica coronata*	

Note:
SE – State Endangered (California Endangered Species Act)
ST – State Threatened (California Endangered Species Act)
BCC - Birds of Conservation Concern (U.S. 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)

SECTION 6 DISCUSSION

Results of three surveys conducted between March 25, 2012 and June 7, 2012 indicate that no Elf Owls were nesting or engaged in a persistent nesting attempt within the study area during the 2012 breeding season. The two Elf Owls detected aurally within the study area on April 15, 2012 were not subsequently detected during the remainder of the first survey round, the second and third survey rounds, or during the follow-up surveys conducted in the vicinity of the April 15 detections. Vocalizations would likely have been detected on subsequent visits if these or other Elf Owls had established a territory in the vicinity of the detection area (Boone 2012). For several reasons, the detected individuals were likely migrants passing through the study area. First, if present on more than a transient basis, Elf Owls would likely have been detected during the follow-up surveys or the three survey rounds. Second, the microphyll woodland habitat in the study area does not support the saguaro-dominated or riparian areas that comprise the species' preferred habitats in the western part of their breeding range. The microphyll woodlands in the study area also sustain a low number of nesting cavities compared with saguaro-dominated or riparian areas. Finally, Elf Owl use of the microphyll woodlands that characterize the study area for nesting would be atypical, particularly since the species' preferred habitat is located and accessible in other regional locations. As a result, the study area likely provides at most a transitory, infrequently used and temporary habitat for the Elf Owl.

Elf Owls throughout their range typically nest and regularly inhabit areas supporting higher stem densities of trees and shrubs and a larger number of tree cavities than are found in the study area. The average vegetation density (stems/ha) for Elf Owls in natural habitats has been documented as 4,080 trees in subtropical thorn woodland, 3,180 trees in riparian forest, lower Rio Grande Valley, Texas (data reduced from Gamel 1997); 1,590 trees and shrubs in Chihuahuan regional upland desert; 1,454 trees, 3,996 shrubs in canyon riparian forest, Guadalupe Mountains, Texas (Gehlbach 1967); and 1,345 trees, 4,889 shrubs in canyon riparian forest, Chiricahua and Huachuca Mountains, Arizona (Henry and Gehlbach 1999). Almost all of the microphyll woodlands in the study area support low stem densities of ironwood and palo verde trees and scattered, isolated mesquite. The mesquite occurs in the form of small individual plants rather than the thickets or bosque sometimes utilized by the species. Trees in the study area are widely dispersed and exhibit typical inter-tree distances of at least 16 meters (50 feet). Approximately 250 acres of the study area are populated with trees that exhibit an inter-tree distance of less than 16 meters or 50 feet. Since the average vegetation density in these areas is slightly higher than the rest of the study area, these areas could provide extremely marginal Elf Owl habitat if a sufficient number of tree cavities were available. Like many secondary cavity-nesting birds (birds that nest in cavities created by other animals), Elf Owls typically require a higher prevalence of tree cavities than documented in the study area. A high prevalence of tree cavities allows secondary cavity-nesting birds like Elf Owls to select cavities based on preferred size and location (Rendell and Robertson 1994). Although some abandoned woodpecker cavities were observed during the surveys in certain ironwood and palo verde trees, the observed density of cavities was low and not generally suitable for Elf Owls. The study area is unlikely to support Elf Owl breeding because of the low stem density of trees and shrubs found throughout almost all of the study area, the lack of nest cavity abundance, and the presence of more suitable habitat and a larger prey base along the Colorado River.

Elf Owls may infrequently use non-riparian or non-saguaro-dominated areas in the western part of their breeding range, but these areas would likely be comprised of vegetation with high stem density and high

15% cloud cover. The major washes in the vicinity of the detection were surveyed over a 4-hour period from 19:40 to 23:51 hours, with broadcast stations spaced 250 meters apart for optimal coverage. No owls were detected during the April 19 follow-up investigation. The locations of the April 19 follow-up survey are identified on Figure 2; the April 16 follow-up survey was conducted as part of the first survey round and the survey locations are not separately identified in Figure 2.

Additional follow-up surveys in the vicinity of the April 15 detections were conducted on May 5 and May 22 during the second and third survey rounds. Conditions on the third follow-up survey night (May 5) were mild and consisted of 0-mph winds, 30.9-26.0 C (87.6-78.8 F) temperature, and 0% cloud cover. Conditions on the fourth follow-up survey night (May 22) consisted of 4-9 mph winds, 37.6-32.1 C (99.7-89.8 F) temperature, and 3% cloud cover. The washes in the vicinity of the initial April 15 detection were surveyed using regularly spaced (400 meter) broadcast stations for approximately 4.5 hours each night. No Elf Owls were detected during these follow-up surveys. The May 5 and May 22 follow-up surveys were conducted as part of the second and third survey rounds and the survey locations are not separately identified in Figure 3.

A final follow-up survey in the vicinity of the April 15 detections was conducted on June 7. Conditions on this evening were mild and consisted of 2-7 mph winds, 36.5-28.9 C (97.7-84.0 F) temperature, and 0% cloud cover. Approximately 30 minutes from 22:30 to 23:00 hours were spent in the vicinity of the initial April 15 detection. Surveyors began the survey with an initial 10 minute listening period and then played a series of broadcast recordings at two locations within suitable habitat for the species. No Elf Owls were detected during the June 7 follow-up-survey. The locations of the June 7 follow-up survey are identified in Figure 3.

5.2 INCIDENTAL BIRD OBSERVATIONS

Twenty species were detected during the three Elf Owl surveys (see Table 2). Great Horned Owls (*Bubo virginianus)* were detected on 14 occasions, and were the only other owl encountered. No Long-eared Owls (*Asio otus*) were detected. A single Swainson's Hawk (*Buteo swainsoni;* BCC, ST (see Table 2 for definitions)), a Brown-crested Flycatcher (*Myiarchus tyrannulus*; WL (see Table 2 for definitions)) and Loggerhead Shrikes (*Lanius ludovicianus;* BCC, SSC (see Table 2 for definitions)) comprised the only special status species incidentally detected during focused Elf Owl surveys.

Table 2.
Bird Species Incidentally Detected During Three Rounds of Elf Owl Focused Surveys

Common Name	Scientific Name	Special Status
Raptors		
Vultures & Hawks	Order Accipitriformes	
Swainson's Hawk	*Buteo swainsoni*	BCC, ST
Red-tailed Hawk	*Buteo jamaicenis*	
Falcons	Order Falconiformes	

cavity density (i.e. mesquite woodlands), which does not occur in the study area. Elf Owls prefer the cottonwood-willow thickets located in riparian areas along the Colorado River for breeding. Substantial habitat similar to the microphyll woodlands in the study area is also located throughout the vicinity of the Project region, particularly to the south and northwest in the Mule Mountains. The Northern and Eastern Colorado Desert Resource Management Plan (NECO) estimates that there are 675,000 acres of microphyll woodland in the NECO planning area which covers 79% of the Colorado Desert region (BLM 2002). The microphyll woodlands that would potentially be affected as a result of the Project comprise approximately 708 acres (though gen-tie and access road alignments have yet to be finalized, it is not anticipated that these should impact more than 1-2 acres). Microphyll woodlands in the Project vicinity that would not be impacted as a result of the Project include Milpitas Wash and the large wash immediately south of the Project site. These areas could be used on a transient basis by the species and would be unaffected by the Project.

SECTION 7 REFERENCES

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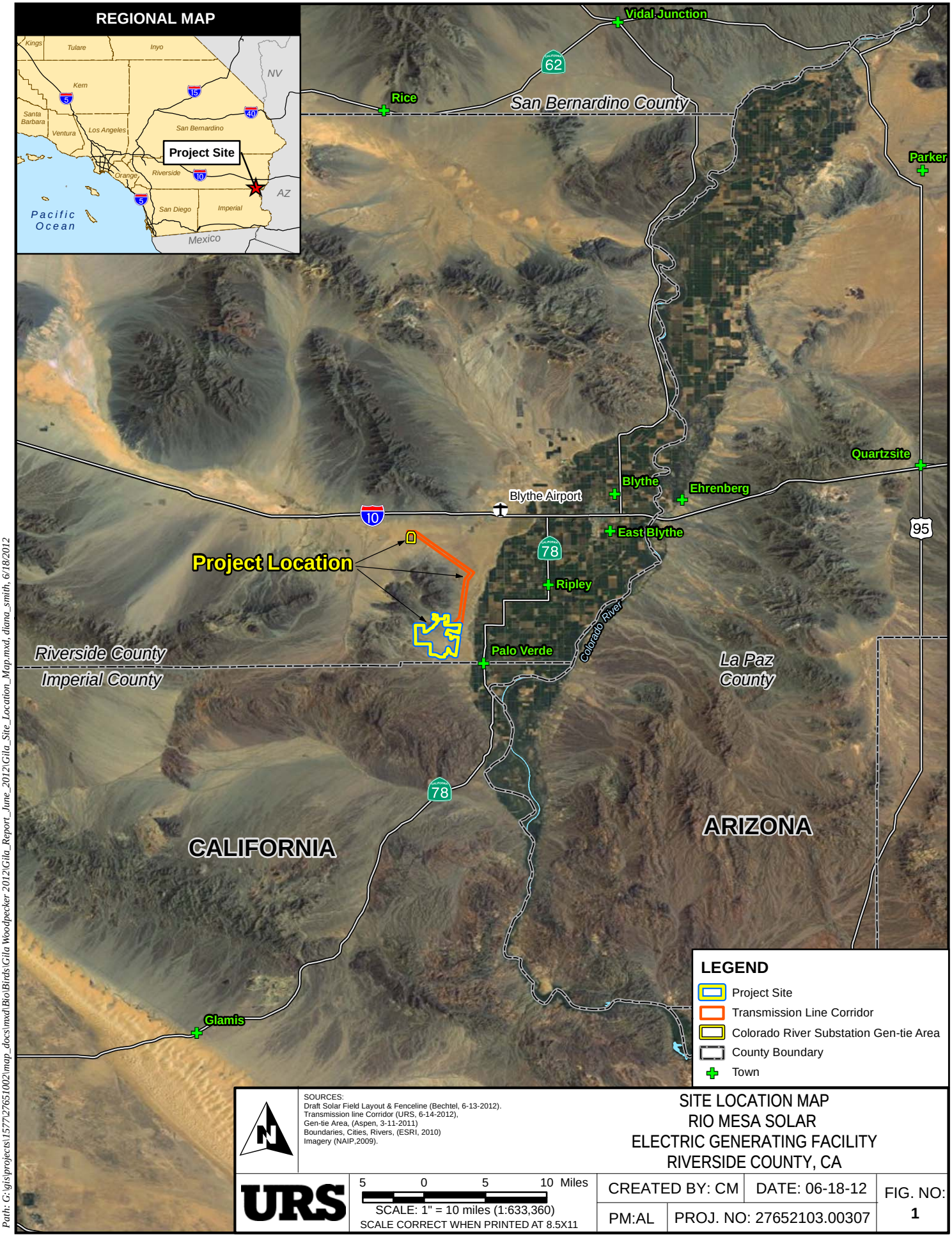
REGIONAL MAP
Kings
Tulare
Inyo
NV
Kern
Santa Barbara
Ventura
Los Angeles
San Bernardino
Project Site
Orange
Riverside
San Diego
Imperial
AZ
Pacific Ocean
Mexico
Vidal Junction
62
Rice
San Bernardino County
Parker
Quartzsite
Blythe
Ehrenberg
Blythe Airport
10
East Blythe
95
78
Project Location
Ripley
Colorado River
Riverside County
Imperial County
Palo Verde
La Paz County
78
CALIFORNIA
ARIZONA
Glamis
LEGEND
Project Site
Transmission Line Corridor
Colorado River Substation Gen-tie Area
County Boundary
Town
SOURCES:
Draft Solar Field Layout & Fenceline (Bechtel, 6-13-2012).
Transmission line Corridor (URS, 6-14-2012),
Gen-tie Area, (Aspen, 3-11-2011)
Boundaries, Cities, Rivers, (ESRI, 2010)
Imagery (NAIP,2009).
SITE LOCATION MAP
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY
RIVERSIDE COUNTY, CA
URS
5 0 5 10 Miles
SCALE: 1" = 10 miles (1:633,360)
SCALE CORRECT WHEN PRINTED AT 8.5X11
CREATED BY: CM
DATE: 06-18-12
FIG. NO: 1
PM:AL
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Elf Owl Round I Results

Survey Method

- Call Stations spaced approximately 150m apart (Original Protocol) March 26th-April 5th
- Call Stations spaced approximately 400m apart (Amended Protocol) April 6 - April 28
- Aprl 19th Follow-up Investigation Call Stations
- Approximate Elf Owl Location (April 15th)
- Half-Mile Fenceline Buffer
- 1-Mile Fenceline Buffer
- 0.4 mile Survey Grid Cells (1/2 Mile Buffer)
- Microphyll Woodland

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

Second Elf Owl Detected From This Call Station

First Elf Owl Detected From This Call Station

Bradshaw Trail

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).
Microphyll Woodland, Survey Grids, Call Stations, Buffers (URS, 2012).

ELF OWL ROUND I CALL STATIONS
2012 ELF OWL SURVEY
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: 7/26/2012	FIG. NO: 2
PM: AL	PROJ. NO: 27651003.20110	

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Elf Owl Round II Results

Call Stations spaced approximately 400m apart (Amended Protocol)
April 29th - May 14th

Elf Owl Round III Results

Call Stations spaced approximately 400m apart (Amended Protocol)
May 22nd - June 7th

June 7th Follow-up Investigation Call Stations

Approximate Elf Owl Location (April 15th)

Half-Mile Fenceline Buffer

0.4 mile Survey Grid Cells (1/2 Mile Buffer)

Microphyll Woodland

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

Bradshaw Trail

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).
Microphyll Woodland, Survey Grids, Call Stations, Buffers (URS, 2012).

ELF OWL ROUNDS II & III CALL STATIONS
2012 ELF OWL SURVEY
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: 7/26/2012	FIG. NO: 3
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Rio Mesa Elf Owl Spring 2012 Surveys

Round of Survey	Date	Survey Start Time	Survey End Time	Starting Temperature (◦C)	Ending Temperature (◦C)	Starting Wind speed (mph)	Ending Wind speed (mph)	Starting Cloud Cover (%)	Ending Cloud Cover (%)	Observers
1	3/26/12	0526	0830	10.0	14.4	4-7	1-3	5	1	JPC, AO
	3/26/12	1802	1855	21.1	15.6	0-3	0-3	0	0	JPC, AO
	3/26/12	0530	0841	11.0	16.3	1.5	2.4	0	0	RR, RD
	3/26/12	1821	2000	23.3	19.7	1-3	1-3	0	0	RR, RD
	3/27/12	0528	0830	10.6	15.6	0	0	0	0	JPC, AO
	3/27/12	1758	1959	23.9	18.3	4-7	1-3	0	0	JPC, AO
	3/27/12	0533	0836	10.7	20	1-3	1-3	0	0	RR, RD
	3/27/12	1755	2009	29.6	23.5	4-7	4-7	0	0	RR, RD
	3/28/12	0532	0846	11.0	18.1	0	1-3	0	5	RD, AO
	3/28/12	1756	2010	29.4	22.8	1-3	0	75	0	RD, AO
	3/28/12	0532	0828	11.1	18	1-3	1-3	0	0	RR, JPC
	3/28/12	1856	1958	28.1	23.7	1-3	1-3	15	20	RR, JPC
	3/29/12	0525	0835	12.8	17.8	0	4-7	0	15	JPC, AO
	3/29/12	0535	0820	14.4	21.7	1-3	4-7	0	0	RR, RD
	3/29/12	1754	1956	33.3	24.3	1-3	1-3	10	5	RR, RD
	3/30/12	0530	0758	14.0	18.9	0	1-3	0	5	RR, RD
	4/3/12	0524	0824	8.8	18.4	1-3	1-3	0	0	RR, RD
	4/3/12	1800	2000	28.6	21.8	1-3	1-3	0	0	RR, RD
	4/4/12	0530	0827	10.1	21	0	1-3	0	0	RR, RD
	4/4/12	1800	2037	31.3	25.8	8-11	8-11	25	0	RR, RD
	4/5/12	0521	0821	17.8	19.6	1-3	1-3	80	50	RR, RD
	4/6/12	0519	0626	13.6	14.5	4-7	4-7	0	0	RR, RD
	4/9/12	1857	2327	30.0	23	1-3	1-3	0	5	RR. SC
	4/11/12	2325	0013	16.1	15	4-10	6-10	0	0	DC, SC
	4/12/12	1924	2234	21.1	17.4	6-8	7-10	100	60	DC, SC
	4/15/12	1935	2352	22.9	18.7	1-3	1-3	0	0	SC, RR
	4/16/12	1910	2311	25.7	21.4	0	0	5	0	SC, RR
	4/17/12	1910	2313	29.5	26.8	0-3	0-3	0	0	SC, SKR
	4/18/12	1930	2250	32.6	28.2	4-7	8-11	5	5	DC, JB
	4/19/12	1940	2351	31.3	26.1	0	1.6-2.2	15	15	DC, JB
	4/20/12	1939	2350	38.5	28.3	0	0	0	0	DC, JB
	4/21/12	1924	2250	34.1	31.3	1-4	2-4	0	0	SKR, SC
	4/22/12	1915	2338	33.5	28.8	1-3	1-2	0	0	SKR, SC
	4/23/12	1915	2308	30.4	25.1	6-8	1-4	0	0	SKR, RD
	4/24/12	1917	2318	32.0	30.4	6-8	4-7	60	100	SKR, RR
	4/25/12	1919	2308	30.4	27.1	0	4-8	95	10	SKR, RR
	4/27/12	1926	2304	28.2	24.6	0-1	0	0	0	SC, MQ
	4/28/12	1922	0010	29.2	23	0	0	5-10	0	SC, MQ

Rio Mesa Elf Owl Spring 2012 Surveys

Round of Survey	Date	Survey Start Time	Survey End Time	Starting Temperature (◦C)	Ending Temperature (◦C)	Starting Wind speed (mph)	Ending Wind speed (mph)	Starting Cloud Cover (%)	Ending Cloud Cover (%)	Observers
2	4/29/12	1942	2351	31.4	25.5	2.1	4	0	0	MH, JB
	4/29/12	2021	2339	30.5	24.7	4-7	2-4	0	0	SC, MQ
	4/30/12	1923	2334	30.3	25.6	5	6.9	0	0	MH, JB
	5/1/12	1956	2351	29.2	24.2	2-8	2-6	60	15	SC, MQ
	5/2/12	2002	0100	26.7	21.8	4.7	3.6	10	10	DC, MH
	5/2/12	1930	2347	27.9	23.3	7-8	4-7	20	10	SC, MQ
	5/3/12	2000	2321	29.4	24.9	3.5	4.9	0	0	DC, MH
	5/3/12	1930	0000	30.2	26.6	2-6	1-3	0	0	SC, MQ
	5/3/12	2021	2326	29.4	24.6	5-8	4-6	0	0	SKR, RR
	5/4/12	1949	0030	29.7	23.8	5.8	4.7	60	60	DC, MH
	5/4/12	1925	2328	31.0	25.1	6-9	5-8	25	15	SC, MQ
	5/5/12	1943	0010	30.9	26	0	0	0	0	SC, MQ
	5/7/12	2026	0028	27.8	25.3	2.3	2.7	20	50	DC, MH
	5/11/12	1929	2323	34.3	29.1	2-4	1-3	0	0	SC, RR
	5/13/12	1932	2255	35.6	31.7	2-4	4-6	15	5	SKR, SC
	5/14/12	1937	2331	37.6	31.9	3-6	2-4	0	0	SKR, SC
3	5/22/12	2035	0018	36.4	29.9	2.7	2	0	10	DC, MH
	5/22/12	1940	2326	36.5	31.9	3-6	1-3	0	0	RB, SKR
	5/22/12	1958	2323	37.6	32.1	4-7	5-9	3	3	SC, RR
	5/23/12	1949	2359	35.6	29	5.5	8.6	0	0	DC, SC
	5/23/12	1948	2350	35.0	29.4	4-8	8-11	8	2	MH, RR
	5/23/12	1947	2354	34.3	29.3	6-9	7-10	0	0	SKR, RD
	5/24/12	1745	2336	31.7	26.1	4.5	5	0	0	RD, MH
	5/24/12	2022	2311	30.4	27.8	7-11	2-4	3	3	SC, DC
	5/24/12	1938	2101	31.0	29.6	3-6	8-11	0	0	SKR, RR
	5/26/12	2029	0006	24.3	21.1	6-9	1-3	0	0	SKR, RD
	5/27/12	1940	0006	28.1	25.1	0-2	2-4	0	0	SKR, RD
	5/28/12	1945	2304	31.2	28.2	0-1	0-1	0	0	SKR, RD
	5/29/12	1955	2258	32.1	28.7	1-4	0-2	0	0	RD, SKR
	5/29/12	1944	2244	34.2	29	4-8	4-8	5	0	RR, AO
	5/30/12	1942	2116	32.0	32.7	0-2	4-8	0	0	RD, SKR
	6/7/12	1945	0001	36.5	28.9	3-7	2-4	0	0	RR, KR

Surveyors Initials: RB-Rick Bailey, JB-John Boone, SC-Scott Carroll, JPC-Jean Paul Charpentier, DC-Dorothy Crowe, RD-Rob DeBaca, MH-Murrelet Halterman, AO-Alicia Omilid, MQ-Meg Quinn, RR-Ryan Randall, SKR-Suzanne Rhodes, KR-Kathryn Riley, AS-Art Schaub

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 Year
With Other Firms: 14 Years

Education

BA, Biological Sciences, California State University, 1984
California Teaching Credential, Life Science, California State University Chico, 1986

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, Palos 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.

Emergency Storage Project, San Diego County Water Authority, San Diego, CA, 1995:
Conducted focused surveys for California gnatcatcher and arroyo southwestern toad. 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

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

Eric Bailey
URS Corporation
4225 Executive Square, Suite 1600
La Jolla, CA 92037
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Fax: (858) 812-9293
eric.bailey@urs.com

JOHN D. BOONE, PH.D.

10550 Aldebaran Drive • Reno, Nevada 89508 • phone 775.233.4544 • boone@gbbo.org •

SPECIALTY

Ecology, mammalogy, wildlife-habitat relationships, ornithology, disease ecology, research design and analysis

EMPLOYMENT

GREAT BASIN BIRD OBSERVATORY — 2006 - Present
Research Director — *Reno, Nevada*

UNIVERSITY OF NEVADA, RENO — 2000 - 2006
Assistant Professor — *Reno, Nevada*
Disease ecology

UNIVERSITY OF NEVADA, RENO — 1995 - 1999
Postdoctoral Biologist — *Reno, Nevada*
Disease ecology

UNIVERSITY OF DENVER — 1994
Adjunct Professor — *Denver, Colorado*

UNIVERSITY OF COLORADO AND DENVER MUSEUM OF NATURAL HISTORY — 1991 - 1994
Research Associate — *Boulder and Denver, Colorado*
Ecology and mammology

UNIVERSITY OF COLORADO — 1991, 1995
Teaching Assistant — *Boulder, Colorado*

IDAHO STATE UNIVERSITY AND U.S. DEPARTMENT OF ENERGY — 1988 - 1990
Research Assistant — *Pocatello, Idaho*
Ecology and mammology

IDAHO STATE UNIVERSITY — 1988
Teaching Assistant — *Pocatello, Idaho*

EDUCATION

BIOLOGY, PH.D. — 1991 - 1995
University of Colorado — *Boulder, Colorado*

BIOLOGY, M.S. — 1987 - 1990
Idaho State University — *Pocotello, Idaho*

BIOLOGY (MAJOR) AND PHYSICS (MINOR), B.S. — 1981 - 1986
George Washington University — *Washington, D.C.*

SELECTED PROJECTS AT GREAT BASIN BIRD OBSERVATORY

UTAH STATEWIDE SPOTTED FROG MONITORING PLAN (2006)
Co-author

FINAL REPORT TO THE UTAH MITIGATION RECLAMATION AND RESTORATION COMMISSION (UMRRC) ON POST-RESTORATION HABITAT MAPPING AND RECOVERY (2006-2007) ON THE PROVO RIVER
Cco-author

FINAL MANAGEMENT PLAN TO THE UMRRC ON BEAVER ACTIVITY AND IMPACTS (2006-2007)
Primary author

"ATLAS OF THE BREEDING BIRDS OF NEVADA" (2007 publication)
Co-author

MULTIPLE GREATER SAGE-GROUSE RADIO-TELEMETRY PROJECTS FOR THE BUREAU OF LAND MANAGEMENT, US FISH AND WILDLIFE SERVICE, AND NATIONAL FISH AND WILDLIFE FOUNDATION
Project Director

"NEVADA COMPREHENSIVE BIRD CONSERVATION PLAN" (2010 publication)
Project Director and Co-author

FINAL PROTOCOL FOR ELF OWL SURVEYS FOR THE BUREAU OF RECLAMATION, LOWER COLORADO RIVER MULTI-SPECIES CONSERVATION PLAN PROGRAM (2011)
Project Director

NEVADA STATEWIDE GOLDEN EAGLE NEST SITE INVENTORY PROJECT FOR BUREAU OF LAND MANAGEMENT (2011)
Project Director

REGIONAL SURVEY OF YELLOW-BILLED CUCKOO OCCUPANCY (ongoing)
Project Director

PINYON JAY RADIOTELEMETRY STUDIES IN MANAGED PINYON-JUNIPER WOODLANDS (ongoing)
Project Director

PUBLICATIONS

Boone, J. D. and B. L. Keller. 1993. Temporal and spatial patterns of small mammal density and species composition on a radioactive waste disposal area: the role of edge habitat. *Great Basin Naturalist* 53:341-349.

Hayes, J. P., C. A. Bible, and J. D. Boone. 1998. Repeatability of mammalian physiology: evaporative water loss and oxygen consumption of *Dipdomys merriami*. *Journal of Mammalogy* 79:475-485.

Boone, J. D., E. W. Otteson, K. C. McGwire, P. Villard, J. E. Rowe, and S. C. St. Jeor. 1998. Ecology and demographics of hantavirus infections in rodent populations in the Walker River Basin of Nevada and California. *American Journal of Tropical Medicine and Hygiene* 59:445-451.

Feuer R., J. D. Boone, D. Netski, S. Morzunov, and S. C. St. Jeor. 1999. Temporal and spatial analysis of Sin Nombre virus quasispecies in naturally infected rodents. *Journal of Virology* 73:9544-9554.

Borucki M. K., J. D. Boone, J. E. Rowe, M. C. Bohlman, E. A. Kuhn, R. DeBaca, and S. C. St. Jeor. 2000. The role of maternal antibody in natural infection of *Peromyscus maniculatus* with Sin Nombre virus. *Journal of Virology* 74(5).

Boone, J. D., K.C. McGwire, E.W. Otteson, R. S. DeBaca, E. A. Kuhn, P.Villard, P.F. Brussard, and S.C. St. Jeor. 2000. Remote sensing and geographic information systems: charting Sin Nombre virus infections in deer mice. *Emerging Infectious Diseases* 6(3).

Boone, J. D., K. C. McGwire, E. W. Otteson, R. S. DeBaca, E. A. Kuhn, and S. C. St. Jeor. 2002. Infection dynamics of Sin Nombre virus after a widespread decline in host populations. *American Journal of Tropical Medicine and Hygiene* 67(3):310-318.

Bock, C. E., K. T. Vierling, S. L. Haire, J. D. Boone, and W. W. Merkle. 2003. Patterns of rodent abundance on open-space grasslands in relation to suburban edges. *Conservation Biology* 16(6):1653-1658.

Boone, J. D., McGwire, K., and St. Jeor, S. 2005. Mapping the distribution of Sin Nombre virus infections in deer mice using remote sensing and geographic information systems. pp. 448-458 in "Wildlife Diseases: Landscape Epidemiology, Spatial Distribution and Utilization of Remote Sensing Technology", eds. S. K. Majumdar, J. Huffman, F. J. Brenner, and A. I. Panah. Pennsylvania Academy of Sciences, Easton PA.

Pearce-Duvet, J. M. C., St. Jeor, S. C., Boone, J. D. and Dearing, M. D. 2006. Changes in Sin Nombre virus antibody prevalence in deer mice across seasons: the interaction between habitat, sex, and infection in deer mice. *Journal of Wildlife Diseases* 42(4):819-824.

Floyd, T., Elphick C. S., Chisholm G., Mack K., Elston R. G., Ammon E. M., and Boone J. D. 2007. Atlas of the Breeding Birds of Nevada. University of Nevada Press, Reno NV.

GBBO (Great Basin Bird Observatory). 2010. Nevada Comprehensive Bird Conservation Plan, ver. 1.0. Great Basin Bird Observatory, Reno, NV. Available online at www.gbbo.org/bird_conservation_plan.html

HONORS

PHI BETA KAPPA (1985)
George Washington University

PUBLIC SERVICE

University of Nevada Exploratory Committee to establish the Academy for the Environment (Member 2004)

SPCA of Northern Nevada (Board chair (2002 – 2008) and board member (2001 - present))

Maddie's Spay/Neuter Project in Nevada (Coordinator 2006 – 2008)

Alliance for Contraception in Cats & Dogs (Scientific advisory board member, 2010 – present)

21 E. 15th St. Tucson AZ 85701--520-888-5072 scarroll21@cox.net
Scott Carroll -----Pygmy Owl Biosurveys LLC

I have been a professional field biologist for the last 20 years. Since 3/15/2001 I have been a business owner/private contractor performing biological surveys, primarily for the federally endangered cactus ferruginous pygmy owl (CFPO) throughout the historical range of the species in Arizona. I received my Endangered Species Permit TE37118-0 from USFWS on 3/15/2001. I started surveying for CFPO in 1997 after receiving training with Westland Resources, Environmental Consultants, Tucson AZ., and USFWS. Over the past 15 years I have completed well over 1,000 CFPO survey sessions..

Other Experience

April 2010--rare plant survey near Bakersfield California for Conservation Science Research and Consulting, Spring Valley California, William Boarman, Ph.D. project manager. This projec was related to a potential solar array installation.

April 2009---- rare plant survey near Jean Nevada for Tetra Tech, Inc. Portland Oregon, Mark Baker, Ph.D. head botanist. Surveyed 7,000 acres for 10 target special status plant species. Th project was related to a potential solar array installation.

February thru March 2009---bat exclusion project on Dodge bridge in Tucson for Cottonwood Environmental Consulting LLC, Tucson Arizona

July and August 2008-----Biological monitoring near Lukeville Arizona on border security fenc construction for Recon Environmental, Inc. Tucson Az., Carianne Funicelli project manager. Duties included performing surveys for Sonoran Desert pronghorn antelope, documenting clearing limit violations, relocating wildlife in danger, documenting road kills, documenting wildlife trapped or killed due to collisions with fence, surveying all open trenches and holes fo trapped wildlife, transplanting salvaged cacti, collecting seed for future revegetation project, and coordinating with Kiewit management, border patrol, and Kiewit workers on safety, construction, and security related issues.

Summer 2006----desert tortoise/ burrowing owl survey near California City, California for PCR Services Irvine Ca. Joe Platt Ph.D. project manager. This project was related to a large potenti development project

1997-Present Westland Resources, Environmental Consultants, Tucson, AZ
Biologist

- **Vegetation and habitat specialist**
- **Performed vegetation inventories and sampling**
- **Surveyed for Special –Status species including Cactus ferruginous pygmy-owl, Desert tortoise, Arizona hedgehog cactus, Pima pineapple cactus, and Southwestern willow flycatcher.**
- **Relocation of Endangered species**
- **Performed jurisdictional waters delineation**
- **Performed wetlands delineation**
- **Performed noxious weed surveys**
- **Performed Native Plant Protection Ordinance inventories involving mapping, identifying, and rating trees and shrubs as to viability and transplantability**
- **Performed Biological monitoring on transplanted tree and shrub nurseries**
- **Biological assessment and evaluation preparation**

Summer-Fall 1998-2008 Turn of the Century Restoration and Monitoring, Inc. Tucson, AZ
Rangeland Research and Monitoring

- **Conducted vegetation transect surveys throughout portions of Ted Turner's Armendaris and Ladder ranches, Truth or Consequences NM**
- **Conducted vegetation transect surveys on portions of Gray Ranch, Animas, NM.**
- **Conducted vegetation transect surveys on Nature Conservancy preserve, Red Canyon Ranch near Lander Wyoming**

Summer-Fall 1993-2008 Pete Sundt, Rangeland Ecologist, Pima AZ
Rangeland Research and Monitoring

- **Conducted vegetation transect surveys throughout 350,000acre Gray Ranch, Animas NM**
- **Resurveyed plots on Gray Ranch annually as part of ongoing research monitoring**
- **Collected and identified grasses and other plants**
- **Participated in preparing plant specimens for Gray Ranch herbarium**
- **Participated in surveys on the effects of fire on trees, shrubs, and agaves**
- **Performed vegetation transect monitoring for Animas Foundation, Malpai Borderlands Group, and U.S. Forest service in AZ and NM**

Summer 1997 and 2004 Mark Baker Ph.D., Botanist, Chino Valley AZ
Rangeland Research and Monitoring

- **Conducted vegetation transect monitoring on Navajo Partition Land, Navajo Reservation AZ**

Education

McPherson College McPherson, Kansas

- **B.A.**
- **University of Arizona Graduate School, Dept. of Ecology and Evolutionary Biology classes 1998 Ornithology, 1997 Systematic Botany**

References

- **Meg Quinn, Botanist-Author, Tucson, AZ 520-624-7331**
- **Tom Strong Ph.D., Westland Resources. Inc. Tucson AZ. 520-206-9585**
- **Mark Baker Ph.D., Botanist, Chino Valley, AZ 928-636-0252**
- **Miles Traphagen, Biologist, Turn of the Century Restoration and Monitoring, Tucson, AZ 520-991-6368**
- **Scott Hart, Biologist, Westland Resources, Inc. Engineering and Environmental Consultants, Tucson , AZ 520-206-9585**

Permits/Professional Training	**USFWS Endangered Species Permit TE37118-0 ------Cactus Ferruginous Pygmy Owl, Southwestern Willow Flycatcher** **AGFD Scientific Collecting Permit SP-795063** **Pygmy Owl survey protocol training** **Southwestern Willow Flycatcher survey protocol training** **Chiricahua Leopard Frog Certification Workshop** **Desert Tortoise Survey protocol training** **Burrowing Owl surveyor certification workshop** **Yellow-billed cuckoo survey protocol training**

Jean Paul Charpentier

Biologist/Environmental Planner

Areas of Expertise

- Endangered Species Surveys and Compliance
- Biological Inventory & Habitat Assessment
- Biological Evaluation & Assessment
- Native Plants & Noxious Weed Surveys
- NEPA Compliance

Years of Experience

13 total years (11 years with URS / 2 years with others)

Education

MS/ Wildlife Ecology/ University of Arizona

BA / Psychology / University of Rhode Island

ENDANGERED SPECIES PERMITS

USFWS Permit Number: TE833868

- Cactus ferruginous pygmy-owl
- Southwestern willow flycatcher
- Chiricahua leopard frog
- Yuma clapper rail
- Mexican spotted owl
- Bald eagle

Overview

Mr. Charpentier has 13 years of experience with biological resource studies and environmental planning. He has completed numerous studies for NEPA, ESA, and Clean Water Act compliance. He has coordinated endangered species habitat evaluations, biological evaluations, environmental assessments, native plant preservation plans, endangered species surveys, and noxious weed surveys. Field projects he has managed include endangered species surveys for cactus ferruginous pygmy owls, Pima pineapple cactus, and southwestern willow flycatcher; native plant preservation inventories; noxious weed surveys; and biological monitoring. His field technician experience includes surveys and inventories for endangered species (southwestern willow flycatcher, yellow-billed cuckoo, cactus ferruginous pygmy owl, Pima pineapple cactus, Sonoran desert tortoise, flat-tailed horned lizard, Hualapai milkwort, red-cockaded woodpecker, and others); habitat evaluations for endangered species, biological evaluations, and environmental assessments; plant inventories for native plant preservation plans; riparian habitat evaluations, inventories, and monitoring; and noxious weed surveys.

Project Specific Experience

Endangered Species Surveys & Habitat Evaluations

Project Manager, Pima County On-Call Environmental Services. 2002-present

Project manager for endangered species surveys and habitat evaluations for Pima County On-Call Environmental Services. Conducted habitat evaluations and species surveys for cactus ferruginous pygmy-owl, Pima pineapple cactus, and southwestern willow flycatcher.

Assistant Project Manager, Federal Emergency Management Agency, Southwest Willow Flycatcher Protocol Surveys. 2006

Project manager for southwestern willow flycatcher surveys conducted for the Federal Emergency Management Agency. A total of two surveys were conducted along the Gila River near Safford, Arizona in the summer of 2006.

Project Manager, Pima County Flood Control District, Southwestern Willow Flycatcher Surveys. 2004

Assistant project manager for southwestern willow flycatcher surveys conducted for the Pima County Flood Control District. Surveys were conducted along the San Pedro River in the summer of 2004.

Project Manager, Santa Cruz County Flood Control District, Pima Pineapple Cactus Habitat Evaluation and Protocol Surveys. 2003

SPECIALIZED TRAINING

- Survey Methodology for the Southwestern Willow Flycatcher, 2000 (US Fish and Wildlife Service)
- Survey Methodology for the Cactus Ferruginous Pygmy-owl, 2000 (US Fish and Wildlife Service)
- Survey Methodology for the Chiricahua Leopard Frog 2006 (US Fish and Wildlife Service)
- Biological Assessment Workshop, 2006 (US Fish and Wildlife Service)
- Clean Water Act: Section 404 Workshop, 2001 (Jones and Stokes)
- Wetland Delineation Workshop, 2005 (Wetland Training Institute)

Assistant project manager for Pima pineapple cactus habitat evaluation and surveys for the Santa Cruz County Flood Control District. Habitat evaluation and surveys were conducted in three locations in Santa Curz County as part of flood control improvement projects in the spring and summer of 2003.

Biological Technician, Santa Cruz County Flood Control District, Nogales Wash Project, Nogales, Arizona 2003

Complete southwestern willow flycatcher habitat evaluation and species surveys for flood control improvements along Nogales Wash in Santa Cruz County, Arizona.

Assistant Project Manager, ASARCO Inc. Mission Mine, Cactus Ferruginous Pygmy-Owl Habitat Evaluation and Protocol Surveys. 2002

Assistant project manager for cactus ferruginous pygmy-owl habitat evaluation and protocol surveys conducted for ASARCO Inc. at the Mission Mine near Green Valley, Arizona. A total of two surveys were conducted during the winter and spring of 2002.

Assistant Project Manager, ASARCO Inc. Mission Mine, Pima Pineapple Cactus Habitat Evaluation and Protocol Surveys. 2002

Assistant project manager for Pima pineapple cactus habitat evaluation and protocol surveys for the Santa Cruz County Flood Control District. conducted for ASARCO Inc. at the Mission Mine near Green Valley, Arizona. Habitat evaluation and surveys were conducted during the winter and spring of 2002.

Biological Technician, Pima County Flood Control District, Cortaro Bosque, Tucson, Arizona. 2002

Complete habitat evaluation and breeding bird survey of wetland rehabilitation project along the Santa Cruz River in Tucson, Arizona.

Biological Technician, ASARCO Inc. Ray Mine, Southwestern Willow Flycatcher Habitat Evaluation and Protocol Surveys. 2001

Complete cactus ferruginous pygmy-owl habitat evaluation and protocol surveys conducted for ASARCO Inc. at the Ray Mine in central Arizona.

Phelps Dodge, Inc. Gila River Mitigation Area, Safford, Arizona 2001.

Complete habitat evaluation and southwestern willow flycatcher surveys for mitigation site along the Gila River in Graham County, Arizona.

Dorothy Crowe

Wildlife Biologist
Henderson Nevada 89074

Education

Department of Biological Sciences, University of Nevada, Las Vegas, NV
Bachelor of Science: major in biological sciences, minor in chemistry, 1992

Work Experience

Wildlife Biologist, part-time, US Geological Survey, Western Ecological Research Center, 160 N Stephanie St, Henderson NV 89074; Apr2012-present

- Burrowing Owl Population Surveys

Project analyzing breeding season distribution and abundance of Burrowing Owls in Nye County NV

- Conducting breeding season point count surveys using call broadcast protocol

- Burrowing Owl Habitat Suitability Analysis

Project analyzing habitat suitability of Burrowing Owls in the Mojave Desert of Nye County NV

- Documenting nest sites for owls detected on surveys
- Analyzing suitable habitat using a suite of landscape-level biotic and abiotic variables in relationship to nest sites/territories and available habitat sites

Wildlife Biologist, full-time, US Geological Survey, Western Ecological Research Center, 160 N Stephanie St, Henderson NV 89074; Mar2008-Mar2011

- Burrowing Owl Population Surveys

Project assessed distribution and abundance of Burrowing Owls in four habitat types

- Conducted breeding season point count surveys using call broadcast protocol

- Burrowing Owl Nest Site Selection and Reproductive Success Analysis

Project analyzed nest site selection and reproductive success of Burrowing Owls in the Mojave Desert across Clark County NV

- Analyzed nest site selection and reproductive success using a suite of biotic and abiotic variables measured at nest sites and random burrow sites
- Estimated reproductive success using a standardized monitoring protocol

- Burrowing Owl Habitat Suitability Analysis

Project analyzed habitat suitability of Burrowing Owls in the Mojave Desert across Clark County NV

- Analyzed potentially suitable habitat using a suite of landscape-level biotic and abiotic variables in relationship to Burrowing Owl territories and random available habitat sites

Research Associate, part-time, Public Land Institute, University of Nevada, 4505 S Maryland Parkway, Las Vegas NV 89154; May-Sep2006; May-Jul2007

- Mojave Desert Avian Monitoring Surveys

Project assessed the distribution and abundance of Mojave Desert avian species in Clark County, NV

- Conducted standardized point count surveys for Mojave Desert birds and call broadcast surveys for Crissal, LeConte's, and Bendire Thrashers

Research Associate, full-time, University of Nevada, Las Vegas, 4505 S Maryland Parkway, Las Vegas, NV 89154; Mar1998-Apr2006

- Burrowing Owl in the Mojave Desert Project, Mar 2002–Apr 2006

Project determined the distribution, relative abundance, reproductive productivity, and habitat selection of Burrowing Owls in the Mojave Desert

- Planned and conducted field research within the Nevada boundaries of Lake Mead National Recreational Area and at the Marine Corps Air Ground Combat Center, Twentynine Palms, CA

- Developed a new survey protocol for Burrowing Owls specific to the Mojave Desert ecosystem addressing their secretive behavior and low density occurrence
- Documented nesting chronology and reproductive productivity of Burrowing Owls inhabiting native desert environment
- Developed a habitat model for the occurrence of Burrowing Owls at the Marine base

o Neotropical Migratory Land Bird Survey Project, Jun-Sep 1997–2001

Project monitored population status of Southwestern riparian obligate neotropical species in Nevada

- Planned and conducted point count surveys to determine distribution and relative abundance for a suite of desert riparian species along the Virgin and Muddy Rivers
- Monitored breeding birds to determine nesting success, reproductive productivity, Brown-headed Cowbird parasitism, and nest site selection for targeted species

o Desert Tortoise Survivorship Project Oct-Apr 1997–2000

Project assessed Desert Tortoise survivorship on two Mojave Desert study plots within the Nevada boundaries of Lake Mead National Recreational Area

- Conducted telemetry of radio-tagged tortoises to determine survivorship

Project Biologist, full-time, Zone-tailed Hawk Breeding Ecology, New Mexico Game and Fish; 1 Wildlife Way, Santa Fe NM 87507; Apr-Sep 1990–1992

Project determined distribution and breeding ecology of Zone-tailed Hawks at the northern limit of its breeding range in the southwestern United States

- Planned and conducted off-road walking surveys using recorded Zone-tailed Hawk territorial vocalizations to assess their breeding density within Bandelier National Monument, Jemez Mountains, NM
- Determined first estimates of breeding chronology, nesting density, and reproductive productivity at northern limit of this species distribution
- Documented breeding diet by monitoring both 1) prey deliveries and 2) collecting prey remains and food castings

Biological Technician, full-time, Northern Goshawk and Cooper's Hawk Breeding Ecology, New Mexico Game & Fish, Santa Fe NM 87507; Apr-Sep 1985-1988

Project determined occurrence and breeding ecology of Northern Goshawk and Cooper's Hawk within the Jemez Mountains, NM

- Conducted avian point count surveys to document available prey resources
- Documented breeding diet using prey deliveries, collecting prey remains, and food castings
- Radio-tracked hawk movements associated with foraging, resting, and roosting patterns

Biological Technician, part-time, Sandhill Crane and Whooping Crane Migration Project, Eagle Ecological Services, 30 Fonda Rd, Santa Fe NM 87505;Sep-Nov 1985-1986

Study determined abundance of Sandhill Cranes and occurrence of endangered Whooping Cranes within Sandhill Crane flocks, migrating along the Rio Grande River, NM

- Conducted crane counts, including identification of fostered Whooping Cranes, during fall migration along Rio Grande River migration corridor near Los Alamos in northern New Mexico

Publications and Presentations

Crowe, D. E., and K. M. Longshore. 2010. Estimates of density, detection probability, and factors influencing detection of Burrowing Owls in the Mojave Desert. Journal of Raptor Research 44(1):1-11.

Crowe, D. E., and K. M. Longshore. 2010. Population status and reproductive ecology of the Western Burrowing Owl (*Athene cunicularia hypugaea*) in Clark County, NV. Final report prepared for Clark County Multiple Species Habitat Conservation Plan.

Crowe, D. E., and K. M. Longshore. 2009. Population status and reproductive ecology of the Western Burrowing Owl in Clark County, NV. Presentation for the MSHCP Project Progress Report Symposium, Las Vegas, NV.

Crowe, D., and K. Longshore. 2007. Burrowing Owl surveys and management recommendations, Marine Air Ground Task Force Training Command, Twentynine Palms, California. Final report prepared for Marine Air Ground Task Force Training Command, Twentynine Palms CA

Crowe, D. E., and K. Longshore 2005. Distribution and abundance of the Western Burrowing Owl (*Athene cunicularia hypugaea*) in Mojave Desert shrubland on the Marine Corps Air Ground Combat Center, Twentynine Palms, California. Presented at the Western Section of the Wildlife Society Annual Meeting, Sacramento CA Jan 19-21.

Crowe, D. E., and K. Longshore. 2004. Development of survey protocols to determine the distribution and relative abundance of Burrowing Owls at Lake Mead National Recreation Area, Nevada. Poster presented at the Mojave Desert Science Symposium, Redlands CA 16-18Nov.

Crowe, D. E., and D. Thompson. 2001 Ladder-backed Woodpecker cavity-site selection in Joshua tree woodlands. Abstract presented at 71st Cooper Ornithological Society Conference, Albuquerque NM 18-22Apr.

Crowe, D. E., K. Longshore, and M. Sappington. 1997-2000. Distribution and status of avifauna utilizing riparian habitats in Clark County, NV. Annual reports submitted to the US Bureau of Reclamation, Lower Colorado River Region. Boulder City NV

Kennedy, P. L., D. E. Crowe, and T. F. Dean. 1995. Breeding biology of the Zone-Tailed Hawk at the northern limit of its distribution. Journal of Raptor Research 29(2): 110-116.

Robert DeBaca, Ph.D.

Senior Biologist

Areas of Expertise

- NEPA and ESA Planning Projects
- Plant and Wildlife Field Surveys
- Federally Listed Species
- Vertebrate Biology
- Conservation Biology
- Biogeography-Landscape Ecology
- Geographic Information Systems

Years of Experience

With URS: 4+ Years
With Other Firms: 17 Years

Education

- PhD/2008/Texas Tech University /Lubbock, TX
- MS/Biology/1998/Fort Hays State University/Hays, KS
- BA/EPO Biology/1990/ University of Colorado/Boulder, CO
- BA/Environmental Conservation/1990/University of Colorado/Boulder, CO

Training/Certification

- URS Certified Project Manager, 2010
- Flat-tailed Horned Lizard Survey Workshop/BLM, 2010
- Southwestern willow flycatcher survey workshop/USFWS, 2008
- Western yellow-billed cuckoo survey workshop/USFWS, 2008
- Biological Assessment Workshop/ USFWS, 2007
- Desert Tortoise Council Survey Techniques Workshop, 2007
- 40 hour OSHA HAZWOPER

Dr. DeBaca has worked as a professional biologist for more than 21 years. He has filled multiple roles as principal investigator, project manager, task manager, and specialist in devising and conducting ecological research, ecosystem evaluations, and organism-level studies throughout the western United States. His work has included research and protocol surveys of sensitive and federally listed species, baseline ecological conditions, habitat quality, noxious weeds, native plants, habitat rehabilitation, animal diseases, and vertebrate ecology. He has a wealth of knowledge of plants and animals and their ecosystems in the western United States. His recent research experiences have utilized GIS, multivariate statistics, and landscape ecology to investigate and model habitat suitability, ecological potential, and distributions of vertebrates in the southwest. His consulting experience for federal government clients has focused on development of biological sections of NEPA documents, Section 7 consultations, and preparation of Biological Assessments for the Department of Defense and Bureau of Land Management, and US Forest Service. His efforts routinely involve cross-communication with clients, state wildlife departments, and the U.S. Fish and Wildlife Service. His consulting work for private sector clients has centered on biological resource planning and Section 7 & 10 consultations for local construction developments, provincial planning studies, and regional utility infrastructure projects in Arizona, Nevada, New Mexico, California, and Oklahoma, and Colorado.

Project Specific Experience

RMP/EIS Projects

Natural Resource Specialist, White River RMP Oil and Gas Amendment, BLM White River Field Office, Meeker, CO, 2008-2011: Analyzed and wrote impacts sections for wildlife, vegetation, special status species, wild horses, wildland fire, and livestock grazing for an oil and gas RMP amendment.

Project Biologist, Tri-Counties RMPs/EIS, BLM Socorro, NM Field Office, 2007-2008: Analyzed and wrote impacts sections for wildlife and special status species on an RMP/EIS for Sierra, Otero, and Doña Ana counties.

Project Biologist, Ironwood Forest National Monument RMP/EIS, BLM Tucson Field Office, 2007: Prepared final drafts of biological resource sections of an RMP/EIS. Revised a Biological Assessment on Nichol Turk's head cactus and lesser long-nosed bat.

Other NEPA and Resource Management Plan Projects

Biology Resource Lead. Kayenta Mine Permit Renewal EA and Biological Assessment, Navajo County, AZ, 2010-2011. Managed and wrote biological resource and livestock sections of an EA and wrote a supplemental Biological Assessment (BA) to assess impacts from mining.

BA addressed effects to Mexican spotted-owls, mountain plover, Navajo sedge, southwestern willow flycatcher, and bald and golden eagles.

Project Manager, Camp Navajo MTC EA and Biological Assessment. Arizona Army National Guard, Coconino County, Arizona, 2008-2011: Managed and wrote an EA and Biological Assessment (BA) to assess impacts from mission and range upgrades at the facility. BA addressed effects to Mexican spotted-owls and bald eagles.

Project Biologist, Mohave Wind Generation Plant EIS, Mohave County, AZ, 2009-2011. Developed and wrote biological resource, invasive plant, and fire management sections for a wind facility EIS. Designed plant survey protocols. Managed task schedules and budgets.

Lead Biologist, Rainbow Valley Area Drainage Master Plan, Maricopa County, Arizona, Flood Control District, 2008-2011: Lead biologist on coordination, organization, and preparation of ecological assessment of region-wide flood control plans in the Rainbow Valley.

Project Biologist, Black Mesa Facility EIS, Peabody Western Coal Company, Navajo County, AZ, 2008: Revised biological resource sections of EIS for permit renewal and project upgrades for a coal mining facility.

Project Biologist, Desert Rock Power Generation Station EIS, BLM and Sithe Global, San Juan County, NM, 2008: Addressed public comments for biological resources sections of EIS.

Project Biologist, Toquop Power Generation Station EIS, BLM, Las Vegas, NV 2007: Revised biological sections of EIS in response to agency and public comments.

Biological Assessments

Biologist, Biologist, La Cholla Boulevard widening and improvements, Pima County Department of Transportation, 2009-2011: Wrote and revised a biological evaluation to analyze impacts to the lesser long-nosed bat and cactus ferruginous pygmy owl. Conducted wildlife and native plant surveys and habitat assessments.

Biologist, Mesquite General Aviation Airport EIS and BA, City of Mesquite, Mesquite NV, 2007-2008: Advisor on Section 7 consultation and development of a Biological Assessment for a new GAA.

Biologist, Biological Assessment of the Eastern Gila River, Graham County Arizona, Gila Valley Irrigation District, 2007: Wrote a biological assessment for repairs to the Brown Canal diversion dam.

Biologist, Williams Natural Gas Pipeline, La Plata to Pleasant View Compressor Stations, Montezuma County and La Plata County, Colorado, The Williams Companies Inc., 2007: Surveyed pipeline for threatened and endangered species and prepared a no effect memo for prospective repair sites.

Other Projects

Biologist, Palo Verde Solar Site Wildlife Surveys, BrightSource Energy, Blythe, CA, 2011: Performed protocol surveys for desert tortoise, burrowing owls, Mohave fringe-toed lizards, and desert woodrats.

Lead Biologist, Indian Bend Wash 404 Permit Vegetation Monitoring, City of Scottsdale, AZ, 2010-2012: Designed and implemented vegetation monitoring protocols. Reported mitigation findings in annual reports. Managed task elements and budget.

Biologist, Jurisdictional Delineation Survey, BrightSource Energy Hidden Hills, San Bernardino County, CA, 2011: Conducted field surveys in a jurisdictional delineation for ACOE permitting.

Wildlife Biologist, Moffat Collection System Project, Denver Water, Boulder County, CO, 2010: Designed, conducted and reported on protocol wildlife surveys for the northern leopard frog and northern goshawk.

Biologist, Valencia Road Widening and Improvements, Pima County Department of Transportation, Tucson, AZ, 2010-2011: Conducted native plant and wildlife surveys for road improvements. Wrote a biological evaluation and a native plant survey report.

Lead Biologist, Paloverde Solar Site Planning Project, West Maricopa County, Arizona, Areva Inc., 2008 & 2010: Performed ecological site surveys to characterize habitats for threatened and endangered species, rare plants, birds, and wildlife. Wrote biological sections for a BLM plan of development.

Lead Biologist, Dendora and Harquahala Solar Planning Projects, Maricopa County, Arizona, Pacific Solar & Power, 2008: Ran and performed ecological site surveys to characterize habitats for threatened and endangered species, rare plants, and other biological resources.

Wildlife Agency Coordinator & Fatal Flaw Analyst, Solstice Solar Site Planning Project, West Yuma County, Arizona, Ausra Inc., 2008: Performed fatal flaw analysis, state wildlife agency coordination, and technical reviews on development plans for solar a power site.

Project Biologist, CalNev Pipeline Biological Surveys, Southern Nevada and California, Kinder-Morgan, 2008: Performed endangered species protocol surveys for the desert tortoise. Also characterized habitats, conducted general wildlife surveys, and took wash measurements to meet environmental regulations for pipeline improvements.

Wildlife Biologist, Eastern Arizona Framework Study, Eastern counties, Arizona Department of Transportation (ADOT), 2008: Analyzed impacts and issues to sensitive wildlife and threatened and endangered species in relation to preservation sites in eastern Arizona.

Lead Biologist, TS-5 to TS-9 500/230kV Transmission Line Siting Project, Northwest Maricopa County, Arizona, Arizona Public Service, 2007-2008: Compiled data, conducted recce surveys, and analyzed results for special status species, vulnerable habitats, and other

wildlife and plants for transmission line siting studies. Coordinated with agencies and wrote biological sections of reports.

Project Biologist, Nevada, Clark County Wetlands Park Habitat Enhancement & Restoration Plan, 2007-2008: Analyzed survey results and developed recommendations to minimize impacts to wildlife species and federally listed species during habitat restoration. Developed cost estimates for restoration efforts and irrigation systems.

Other Firms

Director of Science and Data Management, Texas Tech University (TTU) Health Sciences Center, 2004-2006: Performed epidemiology research using GIS.

Conservation Biologist/Owner, RSDI Environmental: Lubbock Texas, 2004-2006: Restored grassland habitats, controlled noxious weeds, installed native landscaping in residential areas, and maintained landscaping for residential clients. Operated all facets of this business.

GIS Research Associate, Texas Tech University, 2003-2005: Performed health and demographic research using GIS.

Research Associate, Texas Tech University, 1999-2002: Researched ecological relationships of desert and mountain-dwelling mammals to the existing and past environment.

Environmental Consultant, DA TI MBI Environmental, Highlands Ranch, Colorado, 1998-1999: Performed threatened or endangered species surveys, including Preble's meadow jumping mouse, bald eagles, and burrowing owls. Characterized habitats, prepared biology sections of environmental reports, developed mitigation plans.

Research Associate, Desert Research Institute/University of Nevada, Reno, 1997-1998: Investigated ecological factors of Hanta virus in mice.

Animal Control Officer, Humane Society of the High Plains, Hays, Kansas, 1995-1997: Enforced all city laws for animals, trapped and relocated wildlife, and maintained community relations.

Research Associate/Park Technician, Kansas Wildlife and Parks, 1995: Researched bird use of different cropland and CRP treatments. Supervised employees, developed an arboretum, controlled exotic plant species, and maintained park facilities.

Research Biologist, Denver Museum of Nature and Science, 1991-1993: Performed ecology research at the Rocky Mountain Arsenal to study the effects of disturbance on distribution and habitat use by small mammals, song birds, ferruginous hawks, lagomorphs, and their habitats. Tasks involved experimental design, radio-telemetry, spotlight counts, flush counts, live-trapping, vegetation analysis, and linear bird transects.

Service Experience

Volunteer, Americorps National Service Program, Hays, Kansas, 1995-1996: Successfully achieved in areas of leadership, conflict mediation, media relations, and CPR/first aid. Key components involved developing and implementing educational materials, and directing the development of an interpretive nature trail for Sternberg Museum of Natural History. Other tasks focused on directing and participating in construction projects including a Habitat for Humanity project and giving natural history presentations to grade school children.

Biology Club President, Fort Hays State University, 1995-1996: Increased membership by 20 percent and revenue by 60 percent. Developed and executed a nature photography contest which resulted in a production of a calendar sold for a profit. Other tasks included designing an interpretive nature trail on campus to enhance biology courses instruction.

Peer Counselor, Fort Hays State University, Summer, 1995: Counseled incoming freshmen with class scheduling and orientation.

Volunteer, Denver Museum of Nature and Science, 1990-1995: Developed a training program in the preparation of mammal specimens and facets of curatorial work with zoological specimens. Directed and participated in several mammalian research trips and a paleontology dig. Field work included live trapping of small mammals and mist netting of bats.

Volunteer, Southwestern Research Station of the American Museum of Natural History, 1990: Developed and completed an inquiry into the feeding behavior of nectivorous bats, and studied the natural history of the local flora and fauna. Key tasks included collecting data for studies on thermoregulation of horse lubber grasshoppers, mutualism between ants and lycaenid butterflies, and buzz pollination of solanum rostrum. Other tasks consisted of trapping rodents, noosing lizards, monitoring drift fences, and radio-tracking black-tailed rattlesnakes through mountainous terrain.

Undergraduate Researcher, Institute of Arctic and Alpine Research, 1990: Worked under National Science Foundation (NSF) Research Experience for Undergraduates program. Key tasks involved investigation of quaternary climate change using beetles fossilized in wood rat middens. Collected and analyzed data, co-authored a manuscript and collected data on nematode fauna in alpine soils and habitats.

Intern, Curatorial Consultant, Denver Museum of Nature and Science, 1989-1991: Refurbished and restored tanned skin collection using an innovative storage system. Produced and presented a documentary on conservation and storage of furs.

Volunteer, Roxborough State Park, Littleton, Colorado, 1989: Produced a natural history exhibit about the wildflowers in the park. Experience included taking photographs and slides of plants in bloom, writing natural history descriptions of species, including natural medicinal

uses or economic value to present and past cultures, and cataloguing photos and descriptions in a computer database.

Professional Societies/Affiliates

American Society of Mammalogists (Life Member)

Great Plains Natural Science Society (Life Member)

Southwestern Association of Naturalists (Life Member)

North Dakota Birding Society

Society for Conservation Biology (Inactive)

International Biogeography Society

Awards

2007/ National Scholars Honor Society

2002/ Phi Kappa Phi, Academic Honor Society

2002 / Who's Who in the 21st Century, Contributions in Biogeography and Biology / Cambridge, England

1999/ Beta Beta Beta, Biological Honor Society

1995/ Sigma Xi, Scientific Honor Society

1994/ Red Badge Award for commendable service to Denver Museum of Nature and Science

Publications / Papers

"Terrestrial patterns of mammalian diversity in the Davis Mountains, Texas," (to be submitted) Southwestern Naturalist, 2012.

"Biogeography of montane mammals and associated habitat in the Trans-Pecos," (to be submitted) Journal of Biogeography, 2012.

"Ecological effects on the spatial and temporal distribution of bats in the Davis Mountains, Texas," (to be submitted) Journal of Mammalogy, 2012.

"Technical report on the mammals of found in Texas Parks properties in Jeff Davis and Reeves counties, Texas" Texas Parks and Wildlife Department, 2005.

"Technical report on the mammals of the Davis Mountains," Nature Conservancy of Texas, 2005

"Biogeography of Heteromyid Rodents on the Central Great Plains," (Choate), Occasional Papers Museum of Texas Tech University, 2002

"The Ghost-Faced Bat, *Mormooops megalophylla*," (Jones), Texas Journal of Science, 2002

"Noteworthy Records of Bats from the Trans-Pecos Region of Texas," (Higginbotham, et al.), Texas Journal of Science, 2002

"Infection Dynamics of Sin Nombre Virus Following a Widespread Decline in Host Populations," (Boone, et al.), American Journal of Tropical Medicine and Hygiene, 2002

"Role of Maternal Antibody in Natural Infection of *Peromyscus maniculatus* with Sin Nombre Virus," (Borucki, et al.), Journal of Virology, 2000

"Mammalian Records of Note from the Davis Mountains, Texas and Vicinity," (Jones)

"Remote Sensing and Geographic Information Systems: Charting Sin Nombre Virus Infections in Deer Mice," (Boone, et al.), Emerging Infectious Diseases, 2000

"Evidence for Quaternary Climate Change in the Bolson de Mapimi Region of Mexico," (Elias), 1996

"Bat Facts," Humane Society of the High Plains Newsletter, 1996

"A Study Of The Small Mammal Community at Rocky Mountain Arsenal," (Preston, et al.), Journal of the Colorado Wyoming Academy of Sciences, 1992

Presentations

"Geospatial Patterns and Risk Factors Associated with Poor Health Outcomes in Texas," (Hudson, et al.), American Public Health Association, 2005

"Development and Assessment of an Online Atlas of Health," (Speer), Summer Health Institute, 2005

"Assessing Distribution of Pocket Gophers (Geomyidae) in the Davis Mountains," American Society of Mammalogists, 2004

"Atlas of Rural and Community Health," (Speer, et al.), Symposium of Rural Health Issues, 2004

"Biogeography of Montane Mammals and Associated Habitat in the Trans-Pecos," Southwestern Association of Naturalists, 2004

"Modeling Distributions of Pocket Gophers (Geomyidae) in the Davis Mountains," Texas Society of Mammalogists, 2004

"Access to Primary Care Physicians in Texas," (Mulligan, et al), ESRI International User Conference, 2003

"Care Services for the Elderly in Texas," (Mulligan, et al), ESRI International User Conference, 2003

"Zoogeography of Mammals in Trans-Pecos Texas," American Society of Mammologists, 2003

"Patterns of Mammalian Diversity in the Davis Mountains," Southwestern Association of Naturalists, 2003

"Modeling Habitat and Distribution of the Rock Mouse (Peromyscus nasutus)," Texas Society of Mammalogists, 2003

"Application of GIS, Remote Sensing, and Institutional Partnerships in Transforming Natural History Investigations," Sigma Xi National Meeting, 2002

"Effects of Habitat Type and Elevation on Distribution of Bats in the Davis Mountains," (Jones), American Society of Mammalogists, 2002

"Distribution and Natural History of the Striped Skunk (Mephitis mephitis) in an Urban Environment," Texas Society of Mammalogists, 2002

"Noteworthy Records of Bats from the Davis Mountains," (Jones), Texas Society of Mammalogists, 2001

"Ecological and Geographical Distribution of Perognathus on the Central Great Plains," (Choate), Southwestern Association of Naturalists, 2000

"A Study of the Small Mammal Community at Rocky Mountain Arsenal," (Preston, et al.), Colorado Wyoming Academy of Sciences, 1992

"Feeding Techniques of Long-Nosed Bats, *Leptonycteris yerbabuenae*, at Agave Flowers," Southwestern Association of Biologists, 1990

"Preservation, Reorganization, and Conservation of the Tanned Skin Collection," Denver Museum of Natural History, 1989

DR. MARY MURRELET HALTERMAN

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I have studied birds throughout the western United States, and worked extensively throughout the state of California for the last 30 years. This travel has included working on projects on USDA Forest Service land, in multiple National Parks located in the state, on BLM land and ACOE land, and on state and privately-owned land. I have studied Yellow-billed Cuckoos, Golden Eagles, and Southwest Willow Flycatchers. I have worked in the Great Basin, Mohave Deserts, as well as in the mountains, and have worked alone for weeks in these environments.

EDUCATION

Ph.D. Ecology, Evolution, and Conservation Biology, University of Nevada, Reno. May 2009.
Dissertation: Sexual dimorphism, detection probability, home range, and parental care in the Yellow-billed Cuckoo. Advisor Dr. Lewis Oring

M.S. Biology. California State University, Chico, CA, May 1991. Chairman: Dr. Roger Lederer.
M.S. Thesis. 1991. Distribution and habitat use of the Yellow-billed Cuckoo on the Sacramento River, 1987 - 1990. California State University, Chico, CA. 49pp.

B.S. Wildlife Biology. University of California, Davis, CA, May 1985.

A.A. Biology. American River Community College, Sacramento, CA, 1982.

RESEARCH EXPERIENCE

Elf Owl Pre-construction Clearance Surveys. Great Basin Bird Observatory/URS. Part-time April-May 2012. Conducting surveys for Elf Owls for pre-construction clearance on a large Solar Power Development project near Blythe, CA. Followed project safety protocols, closely coordinated scheduling with a large group of surveyors.

Golden Eagle Surveyor. BioResources BLM California statewide Golden Eagle Nest surveys, December 2011 to present. Duties included independently conducting field surveys under a wide variety of conditions. Worked throughout the Mohave desert in southern California.

Field Leader. GBBO/BLM Nevada statewide Golden Eagle Nest surveys, Great Basin Bird Observatory, April 2011 to present. Duties included developing data sheets and writing the land-based survey methodology, developing survey routes, training and coordinating field technicians, mapping survey locations and providing data for development of maps. Conducted field surveys under a wide variety of conditions.

Project Director. Yellow-billed Cuckoo research for Southern Sierra Research Station. 1999 to

March 2011. Duties include writing all grant proposals for project funding, managing research projects, hiring and supervising field crews, making all logistical arrangements for projects, conducting field research, and preparing reports. Projects have included:

- Yellow-billed Cuckoo research for the LCR MSCP on the Lower Colorado River, 2008 to March 2011. Assess riparian habitat and riparian restoration sites on the Lower Colorado River for presence and use by Yellow-billed Cuckoos. Awarded a competitive grant for 2.2 million dollars for the 5-year project. Worked with 3 field supervisors to coordinate 8 techs covering many sites along the lower Colorado River.
- Study of the biology of cuckoos on the San Pedro River, near Sierra Vista, AZ, on the Bill Williams River NWR, AZ, and the South Fork Kern River, CA, as well as surveys and nest-searching in southern Nevada. Project involved training and supervising a crew of 7-9, conducting surveys, nest searching, vegetation surveys, capturing and banding adults, radiotelemetry of adults, and banding of nestlings. Arranging for housing, transportation, etc, for crew. Annual project budget of 100k.
- Surveys for Yellow-billed Cuckoos in the Sacramento River Area.
- Other duties – Desert riparian bird surveys at multiple BLM sites in southern California (2000 and 2001), Southwest Willow Flycatcher and Bell's Vireo surveys on BLM land in southern and central California (2001).

Principal Investigator. 1999-2000. Status and distribution of the Yellow-billed Cuckoo in California, 1999. Duties included hiring crews, identifying sites, supervising, and coordinating a statewide survey for Yellow-billed Cuckoos and preparing draft and final reports. Worked extensively throughout the state of California, determining survey routes throughout the state.

Research Associate, Kern River Research Center. 1990-2000.

- Supervising and conducting research on the population status and nesting ecology of the Yellow-billed Cuckoo on the Bill Williams River NWR in Arizona (1993-94, and 1997-2000);
- Supervising and coordinating a study in eight National Parks to determine the impact of Brown-headed Cowbird Parasitism on neotropical migratory birds (1995-96) Project required hiring 8-12 researchers, making all housing and other logistical arrangements in two parks in AZ, four parks in CA, and 2 parks in NV, training all crew, and entering data and writing reports;
- Studying endangered riparian birds and surveying riparian birds on riparian restoration sites (1991-97);
- Studying the distribution of forest carnivores - this involved hiring and supervising a small crew and conducting research in remote locations in the Sequoia National Forest in California (1991-92).
- Research project to determine the changes in bird communities in relation to riparian habitat restoration in the Kern River Valley. Duties include surveys of nesting birds and sampling vegetation structure in riparian habitats of various ages (1988-1991).
- Research project to determine population levels of the Elf Owl in California. Duties included planning survey routes, supervising field crew, developing and testing predictive model of Elf Owl's occurrence, daily collection of bird sightings and vegetation analysis along the lower Colorado River, and preparing final report and scientific paper (1987).

- Field Assistant, Estacion Jatun Sacha, Ecuador; February and October-November, 1994. Duties

included opening and closing mist nets, removing birds from the nets, banding, recording data in the field and entering it into a computer, and preparing new net sites in low-elevation primary and secondary tropical rain forest. Supervisor: Bonnie Bochan.

- Principal Investigator, California Department of Fish and Game, 1987. Research project to determine population levels of the Elf Owl in California. Duties included supervising field crew, developing and testing predictive model of Elf Owl's occurrence, daily collection of bird sightings and vegetation analysis along the lower Colorado River, and preparing final report and scientific paper.

TEACHING EXPERIENCE

Teaching Assistant, University of Nevada – Reno. Fall 2002, 2003, 2004, Spring 2004. Assisted with Conservation Biology and Wildlife Ecology and Management. Duties included developing and grading exams, papers, debates, and labs, delivering lectures, and answering student's questions.

Instructor, Cerro Coso Community College. Fall semester 1997, 98, and 99. Teaching basic biology and zoology classes. Duties include designing curriculum, preparing and delivering lectures, designing and setting up labs, preparing and grading exams.

Teaching Assistant, Department of Biological Sciences, California State University, Chico. 1987-1989. Taught labs for basic biology, botany, and ornithology classes. Duties included preparing and delivering lectures, setting up labs, preparing and grading lab exams.

CONFERENCES

Co-coordinator of the Yellow-billed Cuckoo symposium at the 2003 Cooper Ornithological Society meeting.

PUBLICATIONS

Halterman, M. D. 2009. Sexual dimorphism, detection probability, home range, and parental care in the Yellow-billed Cuckoo. Dissertation, University of Nevada, Reno, USA.

Halterman, M. D., M. J. Johnson, and J. A. Holmes. 2008. Western Yellow-billed Cuckoo natural history summary and survey methodology. Unpublished draft report.

Halterman, M.D. and M. Johnson. 2006. Draft Survey Methodology and Natural History of the Yellow-billed Cuckoo. Southern Sierra Research Station, P.O. Box 1316 Weldon CA 93255.

Halterman M.D. 2005. Surveys and Life History Studies of the Yellow-Billed Cuckoo: Summer 2002. Administrative report to the Bureau of Reclamation, Boulder City office.

Halterman M.D. 2004. Surveys and Life History Studies of the Yellow-Billed Cuckoo: Summer 2002. Administrative report to the Bureau of Reclamation, Boulder City office.

Halterman M.D. 2003. Surveys and Life History Studies of the Yellow-Billed Cuckoo: Summer 2002. Administrative report to the Bureau of Reclamation, Boulder City office.

Halterman, M. D., Gilmer, D.S., Laymon, S.A., and Falxa, G. 2004. Yellow-billed Cuckoo Survey Methodology in California: 1999-2000. *In* Proceedings of the 2000 CA Riparian Ecosystems Conference in Sacramento, CA. Editor: M.L. Morrison.

Halterman, M.D., D.S. Gilmer, S.A. Laymon, and G.A. Falxa. 2001. Status of the Yellow-billed Cuckoo in California: 1999-2000. Report to the USGS-BRD Dixon Field Station, 6924 Trmont Rd, Dixon, CA 95620.

Halterman, MD, S. Allen and S.A. Laymon. 1999. Assessing the impact of Brown-headed Cowbird Parasitism in eight national parks. Pp. 153-159. *In* Research and Management of the Brown-headed Cowbird in Western Landscapes. (M.L. Morrison, L.S.Hall, S.K Robinson, S. I. Rothstein, D.C. Hahn, T.D Rich, *Eds.*). Studies in Avian Biology #18, The Cooper Ornithological Society.

Laymon, S.A. and M.D. Halterman. 1989. A proposed habitat management plan for Yellow-billed Cuckoos in California. pp.272-277. In D. Able [ed.], California Riparian Systems: protection, management and restoration for the 1990's. U.S.D.A. Forest Service. Gen. Tech. Rep. PSW-110, Berkeley, CA.

Halterman, M.D., S.A. Laymon, and M.J. Whitfield. 1989. The status and distribution of the Elf Owl in California. West. Birds 20:71-80.

Laymon, S.A., and M.D. Halterman. 1987. Yellow-billed Cuckoos: can the western subspecies be saved from extinction? West. Birds 18:19-25.

References:

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Alicia Omlid

Biologist

Areas of Expertise

Biological Surveys
Environmental Planning & Restoration

Years of Experience

With URS: 1 Year
With Other Firms: 4 Years

Education

MA, Geography: Resource Management & Environmental Planning with an emphasis in Biogeography, San Francisco State University, 2010

BA, Landscape Architecture, University of Oregon, 2005

Overview

Ms. Omlid is a Biologist in the URS San Diego office. She has supported document preparation, including editing for clarity and accuracy and writing portions of documents. Ms Omlid's position at URS also involves protocol surveys for special status wildlife species, botanical surveys, and vegetation monitoring on restoration projects. Her experience includes planning at the local level with the Port of San Francisco and she has performed environmental volunteer field work (i.e. habitat restoration, biological surveys (wildlife & vegetation), water quality monitoring) from San Diego, California to Portland, OR prior to joining URS. Ms. Omlid's educational background was ecologically and biogeographically focused as exemplified by courses in Applied Ecology, Biogeography, Watershed Assessment & Restoration, GIS for Environmental Analysis, Environmental Management, Natural Resource Management, and Tree & Plant Identification. Graduate-level research project topics include: identifying which low-impact design stormwater BMPs could be optimally located in a study area of San Francisco using GIS, taking tree cores to determine growth rate differences in trees infected/not infected with pitch canker, identifying street tree species and associated perceived street tree health, and the effects of climate change on vegetation in Costa Rica. Her education also provided familiarity with environmental laws and policies, as well as experience with geographic and biological field methods.

Project Specific Experience

High-Speed Train Palmdale to Bakersfield, CA. 2012.
Staff biologist performing desert tortoise surveys and habitat mapping for the proposed project area between Palmdale, CA and Bakersfield, CA.

Sonoran West Solar Electric Generating facility, Blythe, CA. 2011-Present:
Staff biologist leading and assisting in leading desert tortoise surveys, performing burrowing owl and elf owl surveys, shadowing botany surveys and managing botanical survey data for this approximately 8,000 acre site. Future work will include helping lead Mojave fringe-toed lizard surveys, and Couch's spadefoot toad surveys. (2011-present)

Rio Mesa Solar Electric Generating facility, Blythe, CA. 2011-Present:
Staff biologist performing desert tortoise, burrowing owl, Mojave fringed-toed lizard, avian point count, gila woodpecker, elf owl, and Couch's spadefoot toad surveys. Assisting in the writing and editing of associated technical documents, and entering data into spreadsheets for this approximately 11,000-acre project site near Blythe, CA.

Santa Margarita River Vegetation Study, Camp Pendleton, CA. 2011:
Staff biologist performing vegetation mapping (ranking vegetation density on transects) along the Santa Margarita River.

Mira Sorrento Place, San Diego, CA. 2011: Staff biologist performing vegetation surveys to determine vegetative cover for a coastal sage scrub/upland scrub/riparian scrub restoration site. Duties also include analyzing associated data and helping to assemble the annual report.

Dana Point Headlands Habitat Restoration, Dana Point, CA. 2011:
Staff biologist performing surveys to determine vegetative cover and container plant success for a coastal sage scrub restoration site.

San Diego River Park Foundation, San Diego, CA. 2010-2011:
Volunteer. Taking inventory and mapping locations of invasive species with GPS.

California Native Plant Society, San Diego, CA. 2011:
Volunteer. Rare plant surveys and vegetation sampling.

Johnson Creek Watershed Council & Xerces Society, Portland, OR. 2010:
Volunteer. Riparian restoration (invasive species removal and planting natives) along the Willamette River.

Middle Fork Willamette Watershed Council - Eugene, OR. 2010:
Volunteer water quality monitor. Taking stream samples and using field equipment (i.e. turbidity meter, conductivity meter, titrator) to determine pH, temperature, DO, conductivity & turbidity.

Oregon State University, Corvallis, OR. 2010:
Volunteer field assistant to a PhD Student in the Water Resource Engineering department. Installing wetland wells and collecting groundwater level data outside Eugene, OR.

Port of San Francisco, San Francisco, CA. 2007-2009:
Student intern providing support to Senior Port Planning and Engineering staff on planning projects. Writing fact sheets, producing presentation graphics, creating PowerPoint presentations, conducting site research (i.e. gathering maps and site plans), reviewing environmental documents, facilitating community meetings, and researching case studies for planning projects. Other duties included editing the *San Francisco Stormwater Design Guidelines*, monitoring plant cover and density of *Suaeda californica* to determine whether restoration efforts were successful.

Professional Societies/Affiliates

Association of Environmental Professionals, Member
California Native Plant Society, Member

Specialized Training

2011/Desert Tortoise Council's Surveying, Monitoring, and Handling Techniques Workshop
First Aid and CPR Training

Contact Information

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MARGARET "MEG" QUINN
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EDUCATION:
B.A., Ecology and Evolutionary Biology, University of Arizona

PROFESSIONAL EMPLOYMENT:

January 2007 - present
Naturalist, Environmental Educator
Pima County Natural Resources, Parks and Recreation
Develop natural history interpretive programs in Pima County
Conduct weekly bird walks at Agua Caliente Park and Sweetwater Wetlands near Tucson.

June-September 2006
Naturalist Guide, Camp Denali/North Face Lodge
Denali National Park, Alaska
Led hikes and interpreted the natural history of Denali National Park for guests of Camp Denali/North Face Lodge.

January-May 2006, January-May 2005
Pygmy Owl Biosurveys
Surveyed for cactus ferruginous pygmy owls in desert areas near Tucson, Arizona. Attended USFWS training on cactus ferruginous pygmy owls in fall of 2004.

October-December 2005, September 2004 – November 2004
Field Botanist, Navajo Nation.
Conducted forage surveys, collected data and identified plants throughout the Navajo Nation in Arizona and New Mexico.

March -May 2005
Field Botanist, Saguaro National Park.
Collected and identified flowering plants for the Park herbarium.

May 2004 – September 2004
Field Botanist, Hummingbird Monitoring Network
Conducted monthly trips to document distribution and record phenology of hummingbird nectar plants in the Chiricahua and Huachuca Mountains. Used HGIS software to map specific populations of nectar plants in target localities.

July 2003 – July 2004
Invasive species mapping, Tuzigoot, Montezuma Castle, Montezuma Well. Sonoran Desert National Parks Monitoring Program.
Identified native and invasive species, and mapped targeted invasives occurring within Park boundaries using HGIS software.

August, 2002 – September 2003
Senior Botanist, Sonoran Desert National Parks Inventory and Monitoring Program, National Park Service.
Collected herbarium specimens and identified flowering plants during fall and spring seasons in six designated National Parks of Arizona.

April 1994 – March 2002.
Director of Education, Tucson Botanical Gardens.
Responsible for development and oversight of all education programs. Supervised five education department staff members. Developed classes, workshops and field trips for adult audiences. Wrote copy for quarterly member newsletter and volunteer newsletter. Coordinated docent training course; trained tour guides.

August – November, 1993.
Field Botanist, Rangeland Monitoring Program, Animas Foundation.
Sampled vegetation within plots located throughout the Gray Ranch, NM.

February 1992 - June 1993.
Horticulturist, Arid Lands Greenhouses. Tucson, Arizona
Propagated plants and managed wholesale, retail and mail order sales.

July – October 1991.
Horticultural Consultant, International Executive Service Corps, Kenya
Worked with the staff of Kenya Jojoba Industries to develop a training program for the propagation of jojoba.

July – September 1990
Vegetation monitoring, Arizona Nature Conservancy.
Established plots and sampled vegetation along transects at Canelo Hills, Aravaipa Canyon and Arivaca Cienega.

August – September, 1990
Botanist, University of Arizona, Sonora, Mexico.
Collected and identified Sonoran desert plant species for pharmaceutical testing at UA.

April 1980-August 1985
Natural History Guide, Borderland Tours
Identified plants and birds for eco-tours throughout the Southwest.

June 1978 – May 1990.
Horticulturist, Arizona-Sonora Desert Museum Botany Department
Directed propagation and research of Sonoran desert plant species..
Conducted annual wildflower walks in Saguaro National Park.
Coordinated annual plant sales. Served as field botanist for natural history field trips; conducted workshops and classes.

PUBLICATIONS:

Wildflowers of the Mountain Southwest, 2003. Rio Nuevo Press.

Cacti of the Desert Southwest, 2001. Rio Nuevo Press.

Wildflowers of the Desert Southwest, 2000. Rio Nuevo Press.

REFERENCES:

Phil Jenkins
Former Assistant Curator, UA Herbarium
520-621-7243
pjenkins@u.arizona.edu

Rick Taylor
Borderland Tours
rtaylor@borderland-tours.com
520-558-2352

Scott Carroll
Owl Biologist
Pygmy Owl Biosurveys
520-888-5072
scarroll21@cox.net

Ryan Randall

Wildlife Biologist

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

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.

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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Fax: (858) 812-9293
Ryan.randall@urs.com

Suzanne L. Rhodes
901 West Coconino Ave.
Flagstaff, Arizona 86001
928-607-7791
slr314@gmail.com

Education

- M.A., Sustainable Landscape Design and Planning, Conway School of Landscape Design, June 2009
- PSMJ Resources, Inc. Project Manager Boot Camp, 2007
- B.S., Botany, minor in Anthropology, Northern Arizona University, Flagstaff, December 1999
- National Environmental Policy Act, 2004
- USFWS permitted for Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*) including nest monitoring, humpback chub (*Gila cypha*).

Relevant Training

USFWS Cactus Ferruginous Pygmy Owl Survey Protocol Training, November 2000
AGFD/USFWS Southwest Willow Flycatcher Survey Protocol Training, May 2001
USFWS Cactus Ferruginous Pygmy Owl Survey Protocol Training February 2003
SWCA/Interagency Southwestern Willow Flycatcher Training, May 2005
USGS Yellow-billed Cuckoo Survey Protocol Training, June 2006

Areas of Expertise

Ms. Rhodes is an experienced biologist with extensive field experience, including the use of Garmin and Trimble GPS units, hiking in remote and challenging environments and driving four-wheel drive vehicles in difficult terrain. She has extensive field experience; collecting information on native and non-native plant distributions and conducting surveys for protected fish and avifauna including the southwestern willow flycatcher, goshawk, humpback chub, and the cactus ferruginous pygmy-owl. She is familiar with the riparian and terrestrial plant communities of the mountains, canyons, and deserts of the Southwest, including native and non-native plant species and vegetation types; and is adept with vegetation mapping and map interpretation. She has been birding as a hobby for many years and routinely participates in informal bird surveys and the annual Audubon Christmas bird count.

Ms. Rhodes' is the owner of a small business that produces custom made color-coded anodized aluminum bands. The technique involves wrapping the bands in automobile pinstriping and then coating them with multiple layers of flexible epoxy. These bands have been used on many bird species including Southwestern willow flycatchers, yellow-billed cuckoos, summer tanagers, and phainopeplas in the U.S. and purple-crowned fairy wrens in Australia.

Professional Experience

Biologist, Self-employed; *Flagstaff, AZ* (2009-present): Participated in numerous rare plant surveys, riparian restoration, vegetation mapping projects and avian point count surveys throughout Arizona, southern California, Nevada, and New Mexico.

Biologist, Natural Channel Design*; Flagstaff, AZ* (2009): Conducted vegetation identification and mapping and wildlife surveys for a riparian restoration project near Phoenix, AZ**.**

Environmental Specialist, *SWCA Environmental Consultants; Flagstaff, Arizona* (2000–2008): Conducted habitat assessments and surveys for various avian species; collected field data concerning the Endangered Species Act, Clean Water Act, and National Environmental Policy Act; organized and interpreted field data; wrote technical documents and correspondence; managed projects and coordinated with clients, other project managers, and technical staff.

Research Assistant, *Dr. Michael Kearsley at Northern Arizona University; Flagstaff, Arizona* (1997): Conducted data entry and analysis, drew vegetation distribution maps, mapped riparian vegetation using the Daubenmire method, and identified plants for the Grand Canyon riparian vegetation monitoring program in the field and the office.

Research Technician, *Northern Arizona University, Department of Geology; Flagstaff, Arizona* (1994–2008): Conducted topographic, hydrographic, and bathymetric surveys of Colorado River sand deposits for studies of sand and sediment movement and deposition.

Relevant Avian Experience

Avian Ecologist / Project Supervisor, Endangered Southwestern Willow Flycatcher Demography and Ecology Studies along the Gila River, AZ. SWCA Environmental Consultants, Flagstaff, AZ. Client: US Bureau of Reclamation, NM. Duties included: Southwestern Willow Flycatcher surveys and habitat evaluation at 47 sites, presence/absence surveys employed USFWS five survey protocol, territory and nest searching and monitoring. Duration: May – August 2008

Avian Ecologist, Endangered Southwestern Willow Flycatcher Demography and Ecology Studies at Topock Marsh, AZ, SWCA Environmental Consultants, Flagstaff, AZ. Client: US Bureau of Reclamation, NV. Duties included: Southwestern Willow Flycatcher presence/absence surveys, territory and nest searching and monitoring and general bird surveys at sites located throughout Topock Marsh. Duration: May – June 2008

Avian Ecologist / Project Supervisor, Endangered Southwestern Willow Flycatcher Demography and Ecology Studies along the Rio Chama and Rio Grande, NM, SWCA Environmental Consultants, Flagstaff, AZ. Client: US Bureau of Reclamation, NM. Duties included: Southwestern Willow Flycatcher surveys and habitat evaluation at 31 sites, presence/absence surveys employed USFWS five survey protocol, territory and nest searching and monitoring. Duration: May – August 2005

Avian Ecologist, Endangered Southwestern Willow Flycatcher Demography and Ecology Studies at Topock Marsh, AZ, SWCA Environmental Consultants, Flagstaff, AZ. Client: US Bureau of Reclamation, NV. Duties included: Attended inter-agency Southwestern Willow Flycatcher Survey and Nest Monitoring Training; Southwestern Willow Flycatcher presence/absence surveys, territory and nest searching and monitoring and general bird surveys at sites located throughout Topock Marsh. Duration: May – June 2005

Avian Ecologist / Project Supervisor, Endangered Southwestern Willow Flycatcher Surveys, Camp Verde Riparian Preserve, Verde River, AZ, SWCA Environmental Consultants, Flagstaff, AZ. Client: Salt River Project. Duties included: Southwestern Willow Flycatcher presence/absence surveys; employed Sogge et al. 3 survey protocol. Duration: May – July 2005

Biologist and Field Coordinator. SWCA Environmental Consultants, Flagstaff, AZ Client: El Paso Natural Gas. Duties included: Conducting surveys for migratory and breeding birds along a utility corridor stretching from El Paso, TX to Santa Clarita, CA. Duration: April–August 2001-2004

Avian Ecologist/ Project Coordinator, Endangered Southwestern Willow Flycatcher Surveys, Grand Canyon, AZ, Helen Yard Consulting, Client: Grand Canyon Monitoring and Research Center, AZ . Duties included: Southwestern Willow Flycatcher presence/absence surveys; employed Sogge et al. 3 survey protocol. Duration: Performed one of the three surveys during July 2004

Aquatic Biologist, representing SWCA, U.S. Fish and Wildlife Service. Humpback chub population monitoring in the Little Colorado River in the Grand Canyon; Interagency cooperative agreement through Grand Canyon Monitoring and Research Center. Worked on a small crew of three people to set hoopnets and insert PIT tags to monitor endangered Humpback Chub and other native fish populations in the Little Colorado River in Grand Canyon. Duration: April-May 2004

Avian Ecologist, Endangered Southwestern Willow Flycatcher Surveys at Tres Rios, Maricopa County, AZ, SWCA Environmental Consultants, Flagstaff, AZ. Client: City of Phoenix AZ. Duties included: Conducted presence/absence surveys for Southwestern willow flycatcher to determine a baseline condition for a Safe Harbor Agreement under the Endangered Species Act; employed Sogge et al. 3 survey protocol. Duration: May-July 2002

Biologist and Field Coordinator. SWCA Environmental Consultants, Flagstaff, AZ Client: Del Webb Properties. Duties included: Conducting surveys broadcasting playback tapes for endangered cactus ferruginous pygmy owls north of Phoenix, near Anthem, Arizona. Duration: January–May 2002

Biologist and Field Coordinator. SWCA Environmental Consultants, Flagstaff, AZ Client: El Paso Natural Gas. Duties included: Conducting surveys broadcasting playback tapes for endangered cactus ferruginous pygmy owls near Tucson, Arizona. Duration: January–May 2001, 2002

Biologist and Field Coordinator. SWCA Environmental Consultants, Flagstaff, AZ Client: Rocking K Ranch. Duties included: Conducting surveys broadcasting playback tapes for endangered cactus ferruginous pygmy owls near Tucson, Arizona. Duration: May, 2001

Biologist and Field Coordinator. SWCA Environmental Consultants, Flagstaff, AZ Client: Madera Estates. Duties included: Conducting surveys broadcasting playback tapes for endangered cactus ferruginous pygmy owls near Tucson, Arizona. Duration: February 2001

Publications and Reports

Koronkiewicz, T.J., and S.L. Rhodes. 2005. Southwestern Willow Flycatcher (*Empidonax traillii extimus*) surveys within Santa Fe National Forest along the Rio Chama and Middle Rio Grande, 2005. Final report submitted to the U.S. Bureau of Reclamation, Albuquerque, NM, by SWCA Environmental Consultants, Flagstaff, AZ. 16 pp.

Rhodes, S. R. and T.J Ayers. 2010. Two New Taxa of *Scutellaria* Section *Resinosa* (Lamiaceae) from Northern Arizona. The Journal of the Botanical Research Institute of Texas (BRIT).

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
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kathryn.riley@urs.com

ARTHUR H. SCHAUB
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Tucson, AZ 85712
435 260 8685
artsch42@yahoo.com

EDUCATION:
Cornell University, *Ithaca, NY*, Masters of Science, Plant Science, 2000
Oregon State University, *Corvallis, OR*, Bachelor of Science, Fisheries Science, 1992
S.U.N.Y. Cobleskill, *NY*. Associates of Science, Fisheries and Wildlife Technology, 1988

FIELD BIOLOGY EXPERIENCE:
2012 ***Independent Field Biologist (projects led by Ironwood Consulting and Alice Karl and Associates)***
Avian Nest Search and Common Raven Raptor Surveys – Desert Center, CA

2011 Avian Point Counts, Burrowing Owl and Raptor Surveys, Desert Tortoise Clearance survey –Blythe, CA
Desert Tortoise Presence / Absence Survey – Victorville, CA / Primm, NV
Desert Tortoise TRED (triangle) Surveys and Plant Community Habitat Assessments – 29, Palms CA, MCAGCC Marine Base
Desert Tortoise Health Assessment Assistance and Presence / Absence Survey – Desert Center, CA

National Park Service – Yellow Stone National Park
2010 Backcountry Amphibian Surveys – Surveyed backcountry wetlands for amphibian presence and abundance

Independent Field Biologist (Subcontractor for projects led by Alice Karl, Kemp Anderson and Mercy Vaughn)
2010 Rare Plant Survey (Spring and Fall) Colorado Desert of CA
Plant Inventory Survey, Brassica Monitoring, Desert Tortoise Survey - Dagget, CA
Mojave Desert Tortoise Survey Triangle transect surveys conducted on MCAGCC Marine Base, 29 Palms, CA.
2009 Mojave Desert Tortoise Survey, Rare Plant Survey, Avian point Counts and Sensitive Species Surveys (plant, mammal, bird and reptile) Various sites in CA and NV deserts.

Independent Field Biologist Subcontractor for Ecosphere Environmental Services, Durango, CO
2007 – 2010 Navajo Reservation Range Lands Survey – Soils and ecological community descriptions, range health analysis, plant identification and mass estimates.
2009 Mexican Spotted Owl Survey - Carson National Forest
2007 Mexican Spotted Owl Survey and Goshawk Surveys - Gila National Forest

2005 – 2006 Navajo Reservation Vegetation Transect Surveys - Plant identification and plant mass estimates for range management applications.
2004 Endangered and Threatened Species Surveys in response to natural gas well development. Prepared related biological reports.

EPG, Inc., Field Biologist,* Tucson AZ*, 2008, Winter-Spring
2007 Rare Plant Surveys - Navajo Reservation, New Mexico.
2007 Monitoring for Coachella Valley Fringe - Toed Lizards During roadway and fence construction in Palm Springs, CA.

2006 Sonora and Mojave Desert Plant and Wildlife Surveys - Endangered and Threatened Species surveys, general habitat assessment and biological inventory surveys. Species surveyed included **Mojave Desert Tortoises, Ferruginous Pygmy Owls and Pima Pineapple Cactus.** General habitat surveys included vegetation inventory, raptor nest searches and bird and reptile inventory.

OTHER EXPERIENCE:

Naturalist / Guide, Camp Denali, Northface Lodge, Summer 2006, 2005
PO Box 67, Denali National Park, AK 99755
Guided day hikes. Created and presented evening programs Obtained an Alaskan CDL and Wilderness First Responder certification as prerequisites for this job.

Director, Rim to Rim Restoration, 2004
PO Box 297, Moab UT 84532
Responsible for all operations of a small not for profit company devoted to removing invasive exotic weed species and re-vegetating with native plants.

***Mexican Spotted Owl Monitoring and Vegetation Survey, 2002 – 2003* Geo-Marine, Inc.** Newport News, VA, Supervisor Ann Bowels.
Trained and supervised a **vegetation survey** crew for collecting plot and transect data within the Gila National Forest of New Mexico (2003). Field technician for the assessment of Mexican Spotted Owl (S*tix occidentalis lucida)* habitat in the Gila National Forest of New Mexico (2002, 2003).

Vegetation Survey, GAP analysis, 2003
USGS, Flagstaff AZ, Supervisor Kathryn Thomas
Traveled throughout Arizona mapping vegetative ecosystems.

Soil Conservationist, 2000 – 2002 United States Department of Agriculture,
Natural Resources Conservation Service, Ellicottville New York
Technical assistance and planning for the Wetland Reserve Program, Wildlife Habitat Incentives Program, Conservation Reserve Program and other programs promoting resource conservation on private lands.

Graduate Research Assistant, 1997 – 2000 Cornell University, Department of Horticulture, Ithaca, NY - Supervisor, Dr. Frank Rossi
Research concentrated on an integrated pest management and biological control.

Integrated Pest Management Scout, 1996 Cornell Cooperative Extension, Orange County, NY – Supervisor, Marie Ulrich
Surveyed various crops to identify and monitor diseases and insect populations.
Consulted farmers to develop strategies to control pests while minimizing pesticide use.

References:

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Mercy Vaughn, Desert Tortoise Researcher
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ECORP Consulting, Inc., 2525 Warren Drive, Rocklin, CA
95677916-782-9100 (office) 916-768-9137 (cell), estitt@ecorpconsulting.com

Elf Owl Survey Form

☐ Project clearance survey
☐ Large area search (research) survey

Date (mm/dd/yyyy):_____

Surveyor(s):_____ Affiliation/Company name: _____

Survey route name/description: _____

_____

_____

_____

Land ownership: _____ Quad. name (Attach map): _____

Township/Range:_____ Section(s):_____ Elevation (ft.): min._____ max. _____

Route previously surveyed? Y N Date (mm/dd/yyyy): _____ Elf owl detected (previous survey): Y N

Official Sunrise/Sunset time: _____ Habitat type (Brown 1994): _____

UTM (start): E_____ N_____ UTM (end): E_____ N_____

START: Time (military):_____ Temp (°C):_____ Wind (mph): _____ Cloud (%): _____

END : Time (military):_____ Temp (°C):_____ Wind (mph): _____ Cloud (%): _____

Moon visible during survey: Y N Moon phase: new ¼ ½ ¾ full

Number of call points completed: _____ Length of survey route (m): _____

Type of player used (brand and model): _____

Owl Detected? Y N (if Y, fill out detection form) Time detected: _____ Call point detected at:_____

Responses: (Describe behavior of other bird species responding _____

_____

_____

_____

Habitat: (Note the habitat conditions with regard to tree/shrub/cacti density, canopy cover, dominant plant species, and topographic information)

_____

_____

_____

_____

_____

Additional comments: (Note disturbances, observed water sources, other birds observations, etc..) _____

_____

_____

_____

_____

_____

_____

Version 01/2000

-owl Survey Form (field note sheet)

Survey route name: _____

Surveyor(s): _____ Date (mm/dd/yyyy): _____

Call Point	Time (military)			Moon visible?	Weather			Avian response			UTM (if change in direction)	
	Start	End	Total (min.)		Wind	Cloud	Temp.	A/V	Spp. Code(s)	Behavior	E	N

Version 01/2000

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 04/15/2012

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Micrathene whitneyi*

Common Name: Elf Owl

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 2 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Ryan Randall
Address: 4225 Executive Square, Suite 1600
La Jolla, CA
E-mail Address: ryan.randall@urs.com
Phone: (858) 812-9292

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses 2 # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Thirteen miles southwest of Blythe, CA on the east side of Mule Mountains on the Palo Verde Mesa.

County: Riverside Landowner / Mgr.: Metropolitan Water District (MWD)

Quad Name: Thumb Peak Elevation: 127 meters

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Rino 650

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy 3 meters meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 703901/3704945

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Microphyll woodland with sparse Palo Verde and Ironwood trees in desert wash approximately 7.1 miles northwest of the Colorado River. Both individuals were aurally detected at night in response to Elf Owl playback recordings at a distance no closer than 400 meters. Both individuals responded with typical high pitched calls and chatter calls persisting two separate instances for approximately 30 seconds each. No visual confirmation was attained; five follow-up visits to the vicinity of the detection between April 16, 2012 and June 7, 2012 were negative. The first individual was detected 400-500 meters northeast of the coordinates provided while the second individual was detected 400-500 meters east of the coordinates provided.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☐ Fair ☑ Poor

Immediate AND surrounding land use: Open space with limited use.

Visible disturbances:

Threats: Solar development

Comments: This detection occurred during baseline assessment surveys in the vicinity of the coordinates provided. Some nest cavities are present in the area, however, lack of a water source and presence of more suitable habitat nearer the river make this area unlikely to support breeding Elf Owls this breeding season or in the future.

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☑ By another person (name): Scott Carroll
☑ Other: Determined aurally by vocalizations

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

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
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DECLARATION OF SERVICE

I, Darin Neufeld, declare that on August 17, 2012, I served and filed a copy of the attached document Applicant's Supplemental Response #8 to CEC Staff Data Request Set 1A (DR 49) dated August, 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:

X 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:

X 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
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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
Darin Neufeld

*indicates change