

**CH2M HILL**

2485 Natomas Park Drive

Suite 600

Sacramento, CA 95833-2937

Tel 916.920.0300

Fax 916.920.8463

July 27, 2010

Mr. John Kessler  
Siting Project Manager  
California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814

Subject: Rice Solar Energy Project (09-AFC-10)  
Golden Eagle Survey Report for Rice Solar Energy Project (RSEP) Riverside  
County, CA

Dear Mr. Kessler:

Attached please find one hardcopy of the Golden Eagle Survey Report for Rice Solar Energy  
Project (RSEP) Riverside County, CA.

If you have any questions about this matter, please contact me at (916) 286-0278 or  
Sarah Madams at (916) 286-0249.

Sincerely,

A handwritten signature in blue ink, appearing to read "Douglas M. Davy".

Douglas M. Davy, Ph.D.  
AFC Project Manager

cc: POS List  
Project File

<b>DOCKET</b> <b>09-AFC-10</b>
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DATE	<u>JUL 27 2010</u>
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**RESULTS OF PROTOCOL SURVEYS FOR NESTING GOLDEN EAGLES (*AQUILA CHRYSAETOS*)  
CONDUCTED IN ASSOCIATION WITH THE PROPOSED RICE SOLAR ENERGY PROJECT  
LOCATED IN UNINCORPORATED RIVERSIDE COUNTY, CALIFORNIA.**

Bloom Biological, Incorporated  
July 21, 2010

The Golden Eagle (*Aquila chrysaetos*) is an uncommon permanent resident and migrant throughout most of California's foothills, mountains, sage-juniper flats and deserts (CDFG 2008), and is protected under the federal Bald and Golden Eagle Protection Act and by the California Department of Fish & Game as a Fully Protected Species. Golden Eagle status studies completed as recently as 1989 suggested a stable population for much of the western United States (Harlow and Bloom 1989), however, recent evidence suggest that eagle numbers in the western United States are now declining. As a result, the U.S. Fish and Wildlife Service (Service) is recommending focused surveys in nesting habitat within ten miles of proposed projects that might cause anthropogenic disturbances to eagles. Future recommendations regarding Golden Eagle wintering and migratory habitat use are being developed. As such, Bloom Biological, Incorporated (BBI) was retained by CH2MHill to conduct surveys for Golden Eagle nests in the vicinity of the proposed Rice Solar Energy Project (RSEP), located in unincorporated Riverside County, California. This report discusses BBI's survey methods, results and recommendations.

## **METHODS**

The Service has recently recommended (Pagel et al. 2010) the following four tasks to determine the likely effects of a project or activity on eagles:

- A. Collection and synthesis of biological data.
- B. Identifying activities that are likely to result in take.
- C. Avoidance and minimization measures.
- D. Quantifying the anticipated take.

BBI's approach generally followed recommendations made in the U.S. Fish and Wildlife Service's (Service) Interim Golden Eagle inventory and monitoring protocols (Pagel et al. 2010), which recommend two surveys for eagle nests by helicopter. The first (Phase 1) is normally conducted in March and the second (Phase 2) in late April/early May 2010. Because of the late time period of this survey, a single survey was conducted over two helicopter flights in May 2010. The Service notes that helicopter surveys are an accepted and efficient means to monitor large areas of habitat, to inventory potential habitat, and monitor known territories (Pagel et al. 2010), as eagles nest on cliffs or large trees in open areas and build a large platform nest often initially 10 feet across and 3 feet high of sticks, twigs and greenery (CDFG 2008). Because of their large size, these nests are easy to spot at a great distance from the air and in California can be distinguished from Red-tailed Hawk (*Buteo jamaicensis*), Common Raven (*Corvus corax*) and Bald Eagle (*Haliaeetus leucocephalus*) by biologists experienced with the nests of those species. The Phase 2 survey can be conducted on foot if feasible. The purpose of the surveys is to record and report occupancy (Phase 1) and productivity (Phase 2) of resident golden eagles including, but not limited to, the following:

- individual activities,

- nests and territories on and surrounding the subject solar farm project, and within an approximate 4- to 10-mile radius of the proposed project (assumed Service requirement).

The potential survey area included the project site and all lands within a ten mile radius surrounding the project site, with a particular emphasis on topographic features and large power line rights-of-way where Golden Eagles are likely to be located (see Exhibit 1). To the north and northeast, the survey included some excellent nesting habitat adjacent to but outside of the ten-mile survey radius. Based on an examination of a topographical map with 10 mile buffer provided by CH2MHill, BBI determined that approximately one third of the proposed survey area had the potential to provide Golden Eagle nesting habitat and was surveyed in its entirety. Within this zone, only certain mountainous areas and the large utility lines would need to be critically examined. No trees of the appropriate size and age were present anywhere within the study area.

The first flight of the survey was conducted on May 14, 2010 following the helicopter survey methodology described in Section VII.b Aerial Surveys of Pagel et al. (2010). All surveys were conducted via helicopter between the hours of 0830 and 1600 (duration of approximately 7 hours). Weather conditions were ideal for the survey with clear skies, moderate winds and temperatures below 80 degrees Fahrenheit. Surveys were conducted by BBI biologists Peter H. Bloom (seated in the front of the helicopter) and Nick Todd (seated in the rear). Two GPS units, 1 primary and 1 backup, were used to document geographic locations of importance and the routes taken. The survey duration was adequate to cover the entire area and reexamine large stick nests for the presence of inactive and active Golden Eagle nests.

The second flight of the survey was conducted on May 29, 2010 also by Bloom and Kidd. This survey was conducted in a helicopter between the hours of 0830 and 1130 (duration of approximately 2.5 hours).

## RESULTS

Compared to other intensively surveyed areas in southern California (Marine Corps Base Camp Pendleton, Naval Weapons Station Fallbrook, Santa Monica Mountains National Recreation Area, The Irvine Ranch, Starr Ranch Audubon Sanctuary, Rancho Mission Viejo) nesting densities of raptors and ravens in this study were low (Bloom unpub.). During the surveys twelve inactive and no active Golden Eagle nests were observed. These nests are believed to have been built by three or four pairs with territories in the area. BBI also identified nine active Red-tailed Hawk nests, three active Prairie Falcon nests, two active Great Horned Owl nests and two active Common Raven nests within the surveyed area (see Tables I and II, Exhibits 1, 1A, 1B). None of the birds appeared disturbed as a result of the helicopter's approach. Some of the nests to the north and northeast, including three of the Golden Eagle nests (representing 1 – 2 nesting territories), were located just outside the ten-mile survey limit (Exhibit 1). Nests located outside of the ten-mile survey limit are noted on Table II.

**TABLE I. SURVEY RESULTS SUMMARY**

Species	Sites Recorded	Inactive Nests	Active Nests
Common Raven	4	2	2
Red-tailed Hawk	18	9	9
Golden Eagle	12	12	0
Prairie Falcon	5	2	3
Great Horned Owl	2	0	2

## DISCUSSION

### *Natural History*

Kochert *et al.* (2002) provided a thorough description of the natural history of the Golden Eagle, noting that the species is found a variety of habitats located in a wide range of latitudes throughout the Northern Hemisphere. In North America, Golden Eagles are most common in the western half of the continent near open spaces that provide hunting habitat, and generally with cliffs present for nesting sites. While northern populations of the species are migratory, often making trips of thousands of miles to the wintering grounds; southern populations (including those in southern California) tend to be resident year-round.

While Golden Eagles are capable of killing large prey such as cranes, wild ungulates, and domestic livestock, they primarily subsist on rabbits, hares, ground squirrels, and prairie dogs (Bloom and Hawks 1982, Olendorff 1976). Golden Eagles typically reach sexual maturity, form territories and begin nesting at four years of age. Pairs generally stay within the limits of their territory, which can measure 20–30 square kilometers, and within that territory can be as many as 14 nests (Bloom pers. obs.) which a pair maintains and repairs as part of their courtship. Over the course of a decade several of these nests will be used and will produce young, others may only be added to with fresh sticks. Most alternate nests are important in the successful reproduction of a pair of eagles. Kochert *et al.* (2002) also noted that the nesting season is prolonged, extending more than 6 months from the time the 1-3 eggs are laid until the young reach independence. A typical Golden Eagle raises an average of only 1 young per year and up to 15 young over its lifetime. Pairs commonly refrain from laying eggs in some years, particularly when prey is scarce. The number of young that Golden Eagles produce each year depends on a combination of weather and prey conditions. The black-tailed jackrabbit is a key prey species throughout much of the range, and eagle reproductive rates fluctuate with jackrabbit population cycles.

### *Adverse Effects of Energy Projects*

While there is currently an effort to build a larger “sustainable” energy infrastructure in the United States and abroad with expected fewer overall environmental effects than the existing hydrocarbon-based infrastructure, conservation biologists are still in the process of establishing what effects alternative energy plants might have on the environment at the local level. It is well-established that Golden Eagles and other raptors are vulnerable to mortality through collision with wind turbines (Orloff and Flannery 1992, PBRG 1997, Madders and Walker 2002). For solar facilities, potential effects on wildlife are in the early stages of investigation, but it is expected that raptors and other species could suffer adverse effects due to reduced foraging habitat, and potentially, a reduction in the prey base also caused by habitat loss for prey species. In the case of the proposed RSEP, the project has the potential to have the following effects on Golden Eagles:

- **Direct Mortality** - Long-term surveys of Golden Eagle populations have shown declines in nesting populations throughout the western United States (Kochert and Steenhof 2002). Franson *et al.* (1995) found that humans cause >70% of recorded deaths, with the leading causes being accidental trauma (collisions with vehicles, power lines, or other structures, 27%), electrocution (25%), gunshot (15%), and poisoning (6%). Lead poisoning in California has also been identified as an important mortality factor with > 30% of a population having elevated levels (Bloom *et al.* 1989, Pattee *et al.* 1990).

Electrocution is a particular risk potentially posed by the RSEP. Golden Eagles are vulnerable to electrocution when landing on power poles, with the risk increasing when inclement weather hampers flight or when wet feathers increase conductivity (Avian Power Line Interaction

Committee 1996). Harness and Wilson (2001) reported that  $\geq 272$  Golden Eagle electrocution deaths occurred in western North America From 1986 to 1996. In areas lacking natural perches such as the area surrounding the RSEP; poles with cross arms diagonal or parallel to prevailing winds are most lethal (Benson 1981, Harness and Wilson 2001).

- **Nest Failures** – Golden Eagles may desert nests in early incubation if disturbed by humans (Thelander 1974), and potential desertion may not be noticed early through behavioral cues as Golden Eagles are not aggressive toward humans in the nest vicinity and will simply leave and not return to the area for hours (Camenzind 1969), if ever. While it is unlikely that project development several miles distant could cause such an effect directly, project implementation could contribute to cumulative or growth-inducing impacts, ultimately causing additional anthropogenic disturbance in the area over time. Increased recreation including the use of dirt roads, off-road vehicle use, rock climbing, and target shooting are all linked to nest failures and over the long-term, complete nest territory abandonment.
- **Indirect Mortality** – Management of healthy eagle populations requires maintaining prey habitat in foraging areas (Kochert et al. 2002) as the availability of food and nesting sites is the primary factor determining nesting density of Golden Eagles (Hunt et al. 1995) and reproductive rates of Golden Eagles often fluctuate with prey densities (Smith and Murphy 1979, Tjernberg 1983, Bates and Moretti 1994, Steenhof et al. 1997, McIntyre and Adams 1999). In southwestern Idaho, Marzluff et al. (1997) have found that behavior and demography of Golden Eagles are closely associated with the abundance of black-tailed jackrabbits (*Lepus californicus*), which are themselves dependent on stands of sagebrush/rabbitbrush interspersed with grassland (Knick and Dyer 1997). Bloom and Hawks (1982), working in the Great Basin Desert of northeast California and northwest Nevada found that 91% of the biomass and 85% of the frequency of prey found in nests were attributed to lagomorphs. Patch sizes of this habitat were found to be an essential feature of Golden Eagle home ranges (Marzluff et al. 1997). Both rabbitbrush and black-tailed jackrabbits are present in the study area, and could potentially be adversely affected by construction of the RSEP within the project's footprint, and perhaps further from the site due to increased anthropogenic disturbance to the surrounding area.

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**TABLE II. FULL GOLDEN EAGLE SURVEY RESULTS**

*Waypoint numbers marked with an asterisk (\*) signify nests located outside of the ten-mile survey limit as shown in Exhibit 1.*

Waypoint	Date/Time	Species	Substrate	Aspect	Status	Comments	Lat	Long
58*	5/14/2010	RED-TAILED HAWK	cliff	W	Active	RED-TAILED HAWK with 3 young. Two nests associated with wpt, only one active	34.2593	-114.734
59*	5/14/2010	COMMON RAVEN	cliff	W	Inactive	Inactive COMMON RAVEN nest	34.2621	-114.736
60*	5/14/2010	PRAIRIE FALCON	cliff		Inactive	Really old looking prairie eyrie. Tremendous amount of white wash	34.2667	-114.74
61*	5/14/2010	RED-TAILED HAWK	cliff	SW	Inactive	inactive RED-TAILED HAWK nest, 2 photos	34.2826	-114.75
62*	5/14/2010	GOLDEN EAGLE	cliff	S	Inactive	2 nest close to one another. Both inactive	34.2805	-114.749
63*	5/14/2010	GOLDEN EAGLE	cliff	N	Inactive	Nest probably active 2008 or 2009	34.2734	-114.735
64*	5/14/2010	COMMON RAVEN	cliff	N	Active	notes say COMMON RAVEN/RED-TAILED HAWK nest, no chicks seen	34.2653	-114.725
65*	5/14/2010	PRAIRIE FALCON	cliff	N	Inactive	notes possibly suggest two nests, one a ledge and one a stick structure. Both unoccupied	34.2634	-114.73
66*	5/14/2010	GREAT HORNED OWL	cliff	N	Active	GREAT HORNED OWL in vicinity of old COMMON RAVEN nest	34.237	-114.789
67*	5/14/2010	GREAT HORNED OWL	cliff	N	Active	fledged young GREAT HORNED OWL	34.2271	-114.793
68	5/14/2010	COMMON RAVEN	cliff	N			34.221	-114.784
69*	5/14/2010	RED-TAILED HAWK	cliff	N	Inactive	Inactive RED-TAILED HAWK nest	34.2236	-114.784
70	5/14/2010	RED-TAILED HAWK	cliff	E			34.221	-114.783
71*	5/14/2010	RED-TAILED HAWK	cliff	E	Active	RED-TAILED HAWK nest with 3 young about 4 weeks old as of May 14, 2010.	34.2266	-114.798
233	5/14/2010	RED-TAILED HAWK	cliff		Inactive		34.1886	-114.846
234	5/14/2010	GOLDEN EAGLE/COMMON RAVEN	cliff		Inactive		34.1886	-114.848
235	5/14/2010	COMMON RAVEN	cliff		Inactive		34.2144	-114.833
236	5/14/2010	GOLDEN EAGLE	cliff		Inactive		33.2069	-114.837



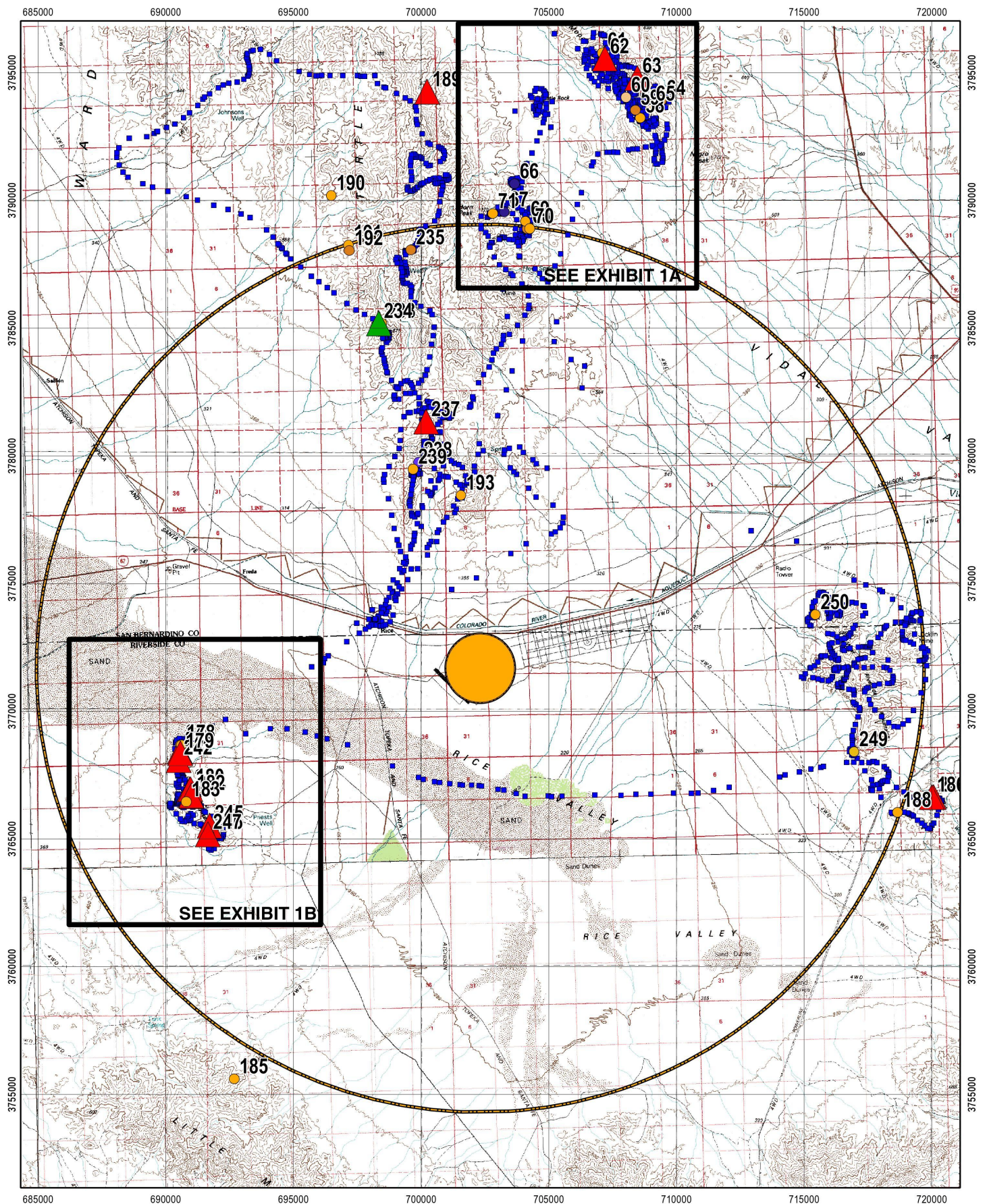
Rice Solar Energy Project – Golden Eagle Survey Results  
 July 21, 2010  
 Table II

237	5/14/2010	GOLDEN EAGLE	cliff		Inactive		34.1535	-114.828
238	5/14/2010	PRAIRIE FALCON/RED- TAILED HAWK/COMMON RAVEN	cliff		Active	Active	34.1392	-114.832
239	5/14/2010	RED-TAILED HAWK	cliff		Active	3 young five weeks old as of May 14, 2010	34.1368	-114.834
240	5/14/2010	RED-TAILED HAWK	cliff		Active	2 young six weeks old as of May 14, 2010	34.0409	-114.936
242	5/14/2010	GOLDEN EAGLE	cliff		Inactive		34.0356	-114.937
245	5/14/2010	GOLDEN EAGLE	cliff		Inactive	nest in big cave	34.0122	-114.924
246	5/14/2010	PRAIRIE FALCON	cliff		Active	2 adults present	34.0091	-114.924
247	5/14/2010	GOLDEN EAGLE	cliff		Inactive		34.0091	-114.925
248	5/14/2010	GOLDEN EAGLE	cliff		Inactive		34.0167	-114.616
249	5/14/2010	PRAIRIE FALCON/RED- TAILED HAWK	cliff		Active	Both adult PRAIRIE FALCON present and there is a second nest that is an INactive RED-TAILED HAWK nest with the same waypoint.	34.0334	-114.65
250	5/14/2010	RED-TAILED HAWK	cliff		Inactive	There are 2 Inactive RED-TAILED HAWK nests associated with this waypoint	34.0822	-114.665
178	5/29/2010	RED-TAILED HAWK	Cliff	NE	Active	Fledged young	34.0409	-114.935
179	5/29/2010	GOLDEN EAGLE	Cliff	NE	Inactive		34.038	-114.936
180	5/29/2010	GOLDEN EAGLE	Cliff	NE	Inactive		34.0252	-114.932
182	5/29/2010	GOLDEN EAGLE	Cliff	N	Inactive		34.023	-114.932
183	5/29/2010	RED-TAILED HAWK	Cliff	SW	Active	Fledged young	34.0208	-114.934
185	5/29/2010	RED-TAILED HAWK	Cliff	SW	Inactive	2 nests at location	33.9224	-114.916
186	5/29/2010	GOLDEN EAGLE	Cliff	SE	Inactive		34.0167	-114.617
188	5/29/2010	RED-TAILED HAWK	Cliff	NW	Inactive		34.0116	-114.632
189*	5/29/2010	GOLDEN EAGLE	Cliff	W	Inactive		34.2702	-114.825
190*	5/29/2010	RED-TAILED HAWK	Cliff	SW	Active	Fledged young	34.2342	-114.867
191	5/29/2010	RED-TAILED	Cliff	SW	Inactive		34.2165	-114.86

Rice Solar Energy Project – Golden Eagle Survey Results  
 July 21, 2010  
 Table II

		HAWK						
192	5/29/2010	COMMON RAVEN	Cliff	SE	Active	Fledged young	34.2146	-114.86
193	5/29/2010	RED-TAILED HAWK	Cliff	W	Inactive		34.1272	-114.814

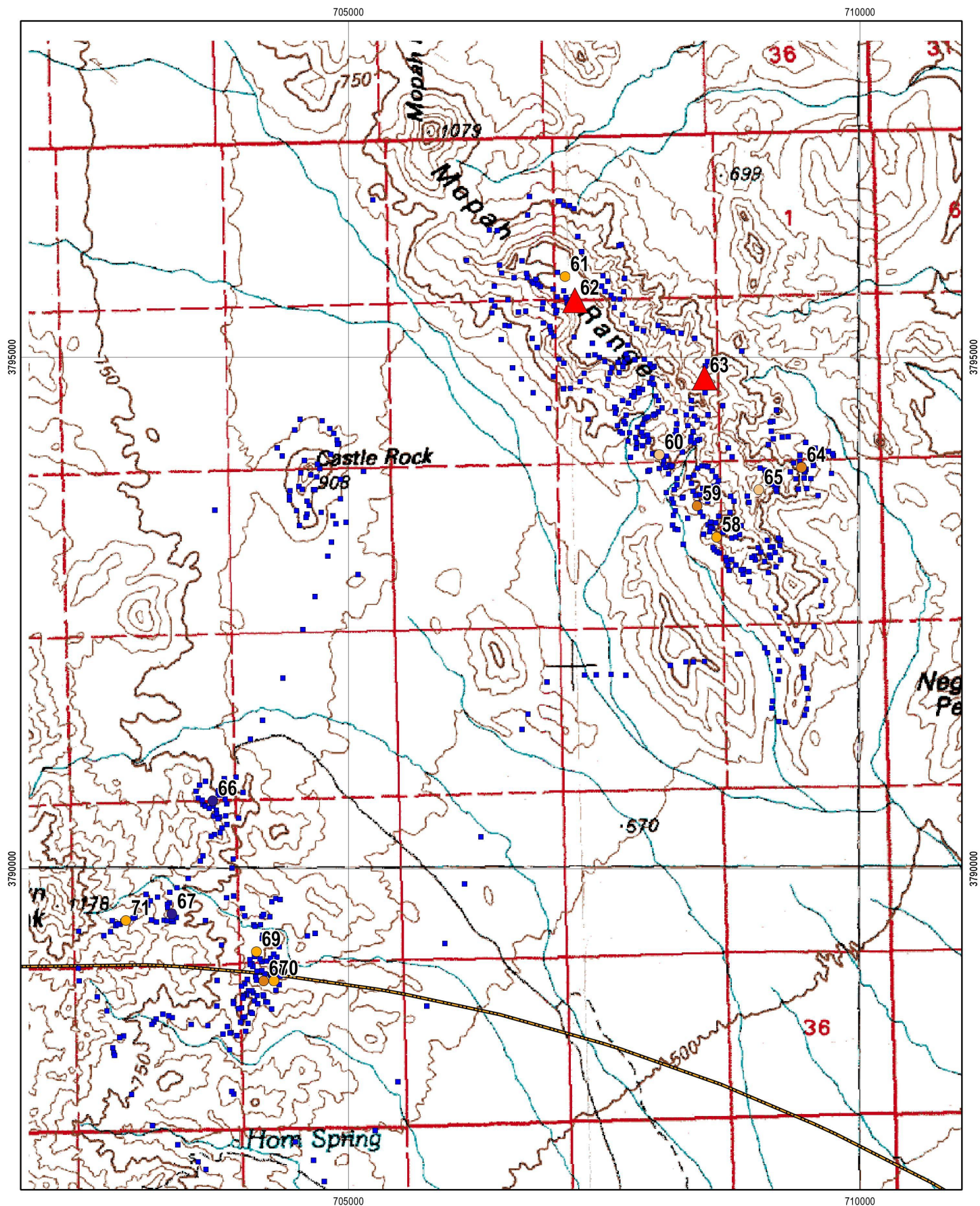




- HelioStar Field Boundary
- - - 10 Mile Buffer
- Helicopter Flight Path
- Common Raven
- Great Horned Owl
- ▲ Golden Eagle
- ▲ Golden Eagle/Common Raven
- Prairie Falcon
- Prairie Falcon/Red-tailed Hawk
- Prairie Falcon/Red-tailed Hawk/Common Raven
- Red-tailed Hawk

**EXHIBIT 1: SITE LOCATION & SURVEY RESULTS**  
RICE SOLAR ENERGY PROJECT | RIVERSIDE COUNTY, CALIFORNIA





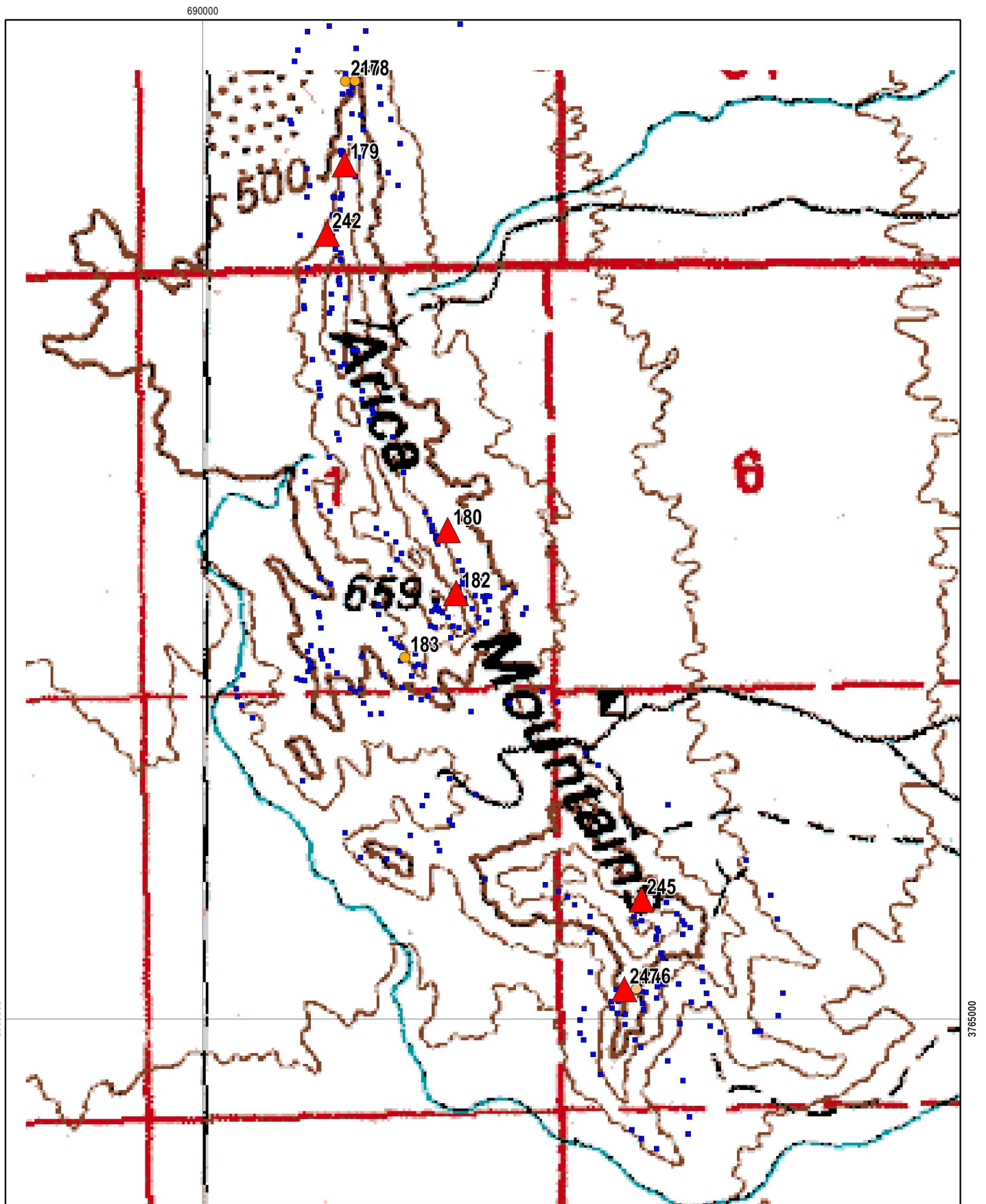
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|--------------------------|---|
| Heliostat Field Boundary | Golden Eagle/Common Raven                   |
| 10 Mile Buffer           | Prairie Falcon                              |
| Helicopter Flight Path   | Prairie Falcon/Red-tailed Hawk              |
| Common Raven             | Prairie Falcon/Red-tailed Hawk/Common Raven |
| Great Horned Owl         | Red-tailed Hawk                             |
| Golden Eagle             |   |

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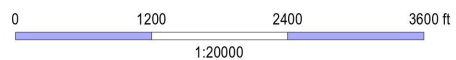
UTM NAD83 Zone 11 Coordinates.  
Map: Marcus C. England.  
England Ecological. 8 July 2010.

**EXHIBIT 1A: SURVEY RESULTS INSET**  
RICE SOLAR ENERGY PROJECT | RIVERSIDE COUNTY, CALIFORNIA





- HelioStat Field Boundary
- 10 Mile Buffer
- Helicopter Flight Path
- Common Raven
- Great Horned Owl
- Golden Eagle
- Golden Eagle/Common Raven
- Prairie Falcon
- Prairie Falcon/Red-tailed Hawk
- Prairie Falcon/Red-tailed Hawk/Common Raven
- Red-tailed Hawk



UTM NAD83 Zone 11 Coordinates.  
Map: Marcus C. England.  
England Ecological. 8 July 2010.

**EXHIBIT 1 B: SURVEY RESULTS INSET**  
RICE SOLAR ENERGY PROJECT | RIVERSIDE COUNTY, CALIFORNIA



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 *RICE SOLAR ENERGY POWER  
PLANT PROJECT***

**Docket No. 09-AFC-10**

***PROOF OF SERVICE*  
(Revised 3/4/2010)**

**APPLICANT**

Jeffrey Benoit  
Project Manager  
Solar Reserve  
2425 Olympic Boulevard, Ste. 500 East  
Santa Monica, CA 90404  
Jeffrey.Benoit@solarreserve.com

Allison Shaffer  
Bureau of Land Management  
Palm Springs/South Coast Field Office  
1201 Bird Center Drive  
Palm Springs, Ca 92262  
allison\_shaffer@blm.gov

**APPLICANT'S CONSULTANTS**

Andrea Grenier  
Grenier and Associates  
1420 East Roseville Parkway, Ste. 140-377  
Roseville, CA 95661  
andrea@agrenier.com

**INTERVENORS**

**ENERGY COMMISSION**

**\*ROBERT WEISENMILLER**  
Commissioner and Presiding Member  
rweisenm@energy.state.ca.us

Douglas Davy  
CH2MHILL  
2485 Natomas Park Drive, Ste. 600  
Sacramento, CA 95833  
ddavy@ch2m.com

**\*KAREN DOUGLAS**  
Chairman and Associate Member  
kldougla@energy.state.ca.us

**COUNSEL FOR APPLICANT**

Scott Galati  
Galati & Blek, LLP  
455 Capitol Mall, Suite 350  
Sacramento, CA 95814  
sgalati@gb-llp.com

Kourtney Vaccaro  
Hearing Officer  
kvaccaro@energy.state.ca.us

John Kessler  
Siting Project Manager  
jkessler@energy.state.ca.us

**INTERESTED AGENCIES**

California ISO  
e-recipient@caiso.com

Deborah Dyer  
Staff Counsel  
ddyer@energy.state.ca.us

Liana Reilly  
Western Area Power Administration  
PO Box 281213  
Lakewood CO 80228-8213  
reilly@wapa.gov

**\*Jennifer Jennings**  
Public Adviser's Office  
publicadviser@energy.state.ca.us

## DECLARATION OF SERVICE

I, Mary Finn, declare that on July 27, 2010, I served and filed copies of the attached, 09-AFC-10-RSEP, the Golden Eagle Survey Report. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [\[http://www.energy.ca.gov/sitingcases/ricesolar\]](http://www.energy.ca.gov/sitingcases/ricesolar).

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

**(Check all that Apply)**

### FOR SERVICE TO ALL OTHER PARTIES:

x \_\_\_\_ sent electronically to all email addresses on the Proof of Service list;

\_\_\_\_ by personal delivery

\_\_\_\_ by delivering on this date for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for the 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 **NOT** marked "email preferred."

**AND**

### FOR FILING WITH THE ENERGY COMMISSION:

x \_\_\_\_ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (**preferred method**);

**OR**

\_\_\_\_ depositing in the mail an original and 12 paper copies, as follows:

#### **CALIFORNIA ENERGY COMMISSION**

Attn: Docket No. 09-AFC-10

1516 Ninth Street, MS-4

Sacramento, CA 95814-5512

[docket@energy.state.ca.us](mailto:docket@energy.state.ca.us)

I declare under penalty of perjury that the foregoing is true and correct.



Mary Finn