



TETRA TECH EC, INC.

**DOCKET**  
**09-AFC-8**

DATE JUN 24 2010

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June 24, 2010

California Energy Commission  
Docket No. 09-AFC-8  
1516 9<sup>th</sup> St.  
Sacramento, CA 95814

**Genesis Solar Energy Project - Docket Number 09-AFC-8**

Docket Clerk:

Enclosed for filing with this letter is one hard copy and one electronic copy of the ***Golden Eagle Surveys Surrounding Four Proposed Solar Developments in Eastern Mojave Desert, Riverside and San Bernadino Counties, California***, dated June 22, 2010.

The survey and report were prepared by Wildlife Research Institute, Inc. to serve the collective data needs of four solar projects including the Genesis Solar Energy Project, Solar Millennium's Blythe and Palen Projects, and First Solar's Desert Sunlight Project.

Sincerely,

Tricia Bernhardt  
Project Manager/Tetra Tech EC

cc: Mike Monasmith /CEC Project Manager





**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](http://WWW.ENERGY.CA.GOV)**

**APPLICATION FOR CERTIFICATION FOR THE  
GENESIS SOLAR ENERGY PROJECT**

**Docket No. 09-AFC-8**

**PROOF OF SERVICE  
(Revised 6/7/10)**

**APPLICANT**

Ryan O'Keefe, Vice President  
Genesis Solar LLC  
700 Universe Boulevard  
Juno Beach, Florida 33408  
E-mail service preferred  
[Ryan.okeefe@nexteraenergy.com](mailto:Ryan.okeefe@nexteraenergy.com)

Scott Busa/Project Director  
Meg Russel/Project Manager  
Duane McCloud/Lead Engineer  
NextEra Energy  
700 Universe Boulevard  
Juno Beach, FL 33408  
[Scott.Busa@nexteraenergy.com](mailto:Scott.Busa@nexteraenergy.com)  
[Meg.Russell@nexteraenergy.com](mailto:Meg.Russell@nexteraenergy.com)  
[Duane.mccloud@nexteraenergy.com](mailto:Duane.mccloud@nexteraenergy.com)  
E-mail service preferred  
Matt Handel/Vice President  
[Matt.Handel@nexteraenergy.com](mailto:Matt.Handel@nexteraenergy.com)  
Email service preferred  
Kenny Stein,  
Environmental Services Manager  
[Kenneth.Stein@nexteraenergy.com](mailto:Kenneth.Stein@nexteraenergy.com)

Mike Pappalardo  
Permitting Manager  
3368 Videra Drive  
Eugene, OR 97405  
[mike.pappalardo@nexteraenergy.com](mailto:mike.pappalardo@nexteraenergy.com)

Kerry Hattevik/Director  
West Region Regulatory Affairs  
829 Arlington Boulevard  
El Cerrito, CA 94530  
[Kerry.Hattevik@nexteraenergy.com](mailto:Kerry.Hattevik@nexteraenergy.com)

**APPLICANT'S CONSULTANTS**

Tricia Bernhardt/Project Manager  
Tetra Tech, EC  
143 Union Boulevard, Ste 1010  
Lakewood, CO 80228  
[Tricia.bernhardt@ttech.com](mailto:Tricia.bernhardt@ttech.com)  
James Kimura, Project Engineer  
Worley Parsons  
2330 East Bidwell Street, Ste.150  
Folsom, CA 95630  
[James.Kimura@WorleyParsons.com](mailto:James.Kimura@WorleyParsons.com)

**COUNSEL FOR APPLICANT**

Scott Galati  
Galati & Blek, LLP  
455 Capitol Mall, Ste. 350  
Sacramento, CA 95814  
[sgalati@gb-llp.com](mailto:sgalati@gb-llp.com)

**INTERESTED AGENCIES**

California-ISO  
[e-recipient@caiso.com](mailto:e-recipient@caiso.com)  
  
Allison Shaffer, Project Manager  
Bureau of Land Management  
Palm Springs South Coast  
Field Office  
1201 Bird Center Drive  
Palm Springs, CA 92262  
[Allison\\_Shaffer@blm.gov](mailto:Allison_Shaffer@blm.gov)

**INTERVENORS**

California Unions for Reliable Energy (CURE)  
c/o: Tanya A. Gulesserian,  
Rachael E. Koss,  
Marc D. Joseph  
Adams Broadwell Joesph  
& Cardoza  
601 Gateway Boulevard,  
Ste 1000  
South San Francisco, CA 94080  
[tgulesserian@adamsbroadwell.com](mailto:tgulesserian@adamsbroadwell.com)  
[rkoss@adamsbroadwell.com](mailto:rkoss@adamsbroadwell.com)

Tom Budlong  
3216 Mandeville Cyn Rd.  
Los Angeles, CA 90049-1016  
[tombudlong@roadrunner.com](mailto:tombudlong@roadrunner.com)

\*Mr. Larry Silver  
California Environmental  
Law Project  
Counsel to Mr. Budlong  
*E-mail preferred*  
[larrysilver@celproject.net](mailto:larrysilver@celproject.net)

Californians for Renewable  
Energy, Inc. (CARE)  
Michael E. Boyd, President  
5439 Soquel Drive  
Soquel, CA 95073-2659  
[michaelboyd@sbcglobal.net](mailto:michaelboyd@sbcglobal.net)

\*Lisa T. Belenky, Senior Attorney  
Center for Biological Diversity  
351 California St., Suite 600  
San Francisco, CA 94104  
[lbelenky@biologicaldiversity.org](mailto:lbelenky@biologicaldiversity.org)

\*Ileene Anderson  
Public Lands Desert Director  
Center for Biological Diversity  
PMB 447, 8033 Sunset Boulevard  
Los Angeles, CA 90046  
[ianderson@biologicaldiversity.org](mailto:ianderson@biologicaldiversity.org)

**OTHER**

Alfredo Figueroa  
424 North Carlton  
Blythe, CA 92225  
[lacunadeaztlan@aol.com](mailto:lacunadeaztlan@aol.com)

**ENERGY COMMISSION**

JAMES D. BOYD  
Commissioner and Presiding  
Member  
[jboyd@energy.state.ca.us](mailto:jboyd@energy.state.ca.us)

ROBERT WEISENMILLER  
Commissioner and Associate Member  
[rweisenm@energy.state.ca.us](mailto:rweisenm@energy.state.ca.us)

Kenneth Celli  
Hearing Officer  
[kcelli@energy.state.ca.us](mailto:kcelli@energy.state.ca.us)

Mike Monasmith  
Siting Project Manager  
[mmonasmi@energy.state.ca.us](mailto:mmonasmi@energy.state.ca.us)

Caryn Holmes  
Staff Counsel  
[cholmes@energy.state.ca.us](mailto:cholmes@energy.state.ca.us)

Robin Mayer  
Staff Counsel  
[mayer@energy.state.ca.us](mailto:mayer@energy.state.ca.us)

Jennifer Jennings  
Public Adviser's Office  
[publicadviser@energy.state.ca.us](mailto:publicadviser@energy.state.ca.us)

I, Tricia Bernhardt, declare that on June 24, 2010, I served and filed copies of the **Golden Eagle Surveys Surrounding Four Proposed Solar Developments in Eastern Mojave Desert, Riverside and San Bernadino Counties, California**, dated June 22, 2010. 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/genesis\\_solar](http://www.energy.ca.gov/sitingcases/genesis_solar)].

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:

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

by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

**AND**

FOR FILING WITH THE ENERGY COMMISSION:

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-8  
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.

Original Signed By:



Tricia Bernhardt



*Final Report*

**Golden Eagle Surveys  
Surrounding Four Proposed Solar  
Developments in Eastern Mojave  
Desert, Riverside and San Bernardino  
Counties, California**

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*for*

**Tetra Tech EC  
143 Union Boulevard, Suite 1010  
Lakewood, CO 80228  
(303) 980-3727**

*by*

**Wildlife Research Institute, Inc.  
P.O. Box 2209  
Ramona, CA 92065  
(760) 789-3992  
dbittner@wildlife-research.org  
www.wildlife-research.org**

**June 22, 2010**

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## FINAL REPORT

### EXECUTIVE PROJECT SUMMARY

**T**his document supersedes any previous reports. It provides the findings of the **Phase 1** and **Phase 2** surveys for Golden Eagles conducted within 10 miles of the project boundaries of the 4 proposed solar developments in the East Mojave Desert Region of California in order to comply with the U.S. Fish and Wildlife Service interim recommendations. Surveys for this project were conducted by helicopter to confirm Golden Eagle activity, occupancy, breeding status of the pairs, and fledging success. Fourteen territories were identified and 9 were confirmed to be active during 2010 while 5 appeared to be inactive. During Phase 1 surveys, an incubating female was observed in 1 of the active territories, Coxcomb Mountains – Northeast. Productivity was confirmed for the Coxcomb Mountain -Northeast pair during Phase 2 surveys with the observance of 2 nestlings approximately 5 weeks of age. In total, 7 Golden Eagles (5 adults and 2 nestlings) were observed during both surveys. Additionally, 12 other species (i.e., Barn Owls, Bighorn Sheep, Common Ravens, Cooper’s Hawks, Great Horned Owls, Grey Fox, Long-eared Owl, Osprey, Prairie Falcons, Red-tailed Hawks, Swainson’s Hawks, and Turkey Vultures) were observed totaling 354 wildlife documentations. All sightings have been documented with GPS locations and recorded on the attached maps and tables as recommended in the USFWS Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance.

## PROJECT SCOPE

The survey work reported here was conducted to record and report activity, occupancy (Phase 1), and productivity (Phase 2) of Golden Eagles (*Aquila chrysaetos*) surrounding 4 proposed solar developments, including a 10-mile spatial buffer from the proposed project boundary to allow for proper data interpretation of occupied territories, a USFWS recommendation (Pagel et al. 2010).

## PROJECT BACKGROUND

Golden Eagles respond to environmental changes in order to survive and reproduction in Golden Eagles, as in many predators, is regulated by prey species abundance. Since 1998, Western North America has been in a prolonged drought and this has affected many species including Golden Eagles (Bittner et al. 2003). Jack Rabbits, an important prey species for Golden Eagles, have also declined (L. LaPre, Bureau of Land Management [BLM] and M. Jorgenson, California State Parks pers.com.). Golden Eagle adults have persevered but reproduction rates have dropped to as low as 12% in some regions, such as the Mojave and Sonoran Deserts of the American Southwest (Bittner et al. 2003). As indicated by Figure 1, studies done by the Wildlife Research Institute (WRI) for the BLM have confirmed these unusually low reproductive levels (WRI 2002, 2003, 2009a).

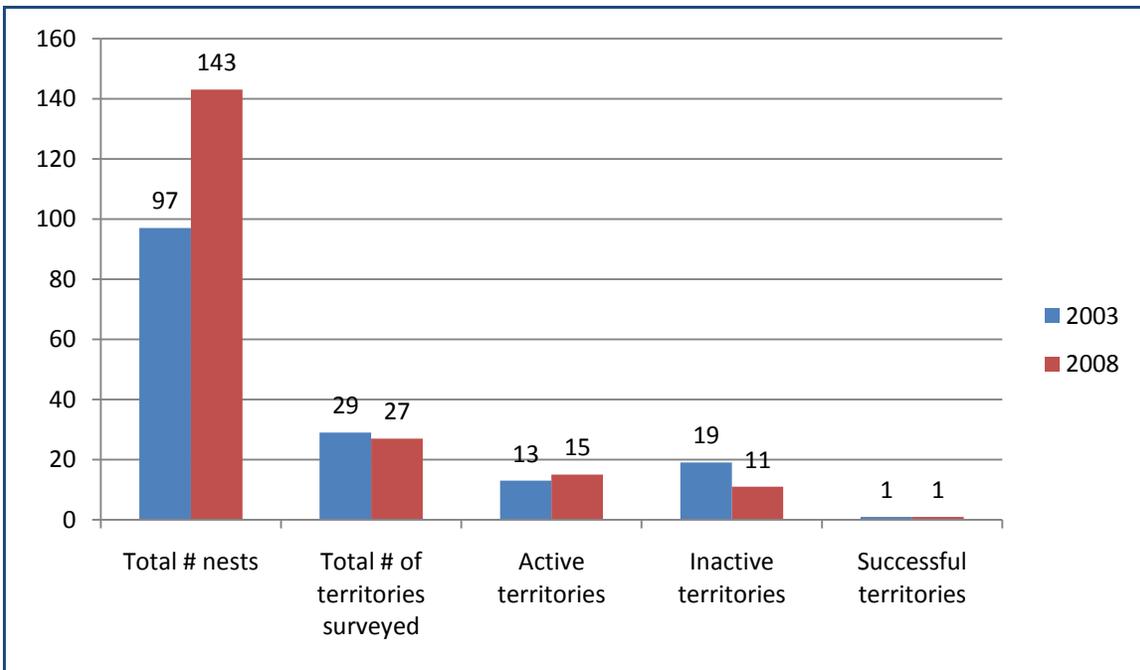


Figure 1. WRI 2003 and 2008 Western Mojave Desert Golden Eagle Data from BLM Studies.

Eagles are large predatory birds with up to 7-foot wingspans and raising young takes a large investment of time and energy. Breeding in Southern California starts in January, nest building and egg laying in February to March, and hatching and raising the young eagles occur from April through June. Once the young eagles are flying on their own, the adult eagles will continue to feed them and teach them to hunt until late November. Then they start all over. This huge investment of time and energy on the part of the adults, just to raise one or two young, causes some pairs to take a year off from breeding once in awhile even when food is abundant.

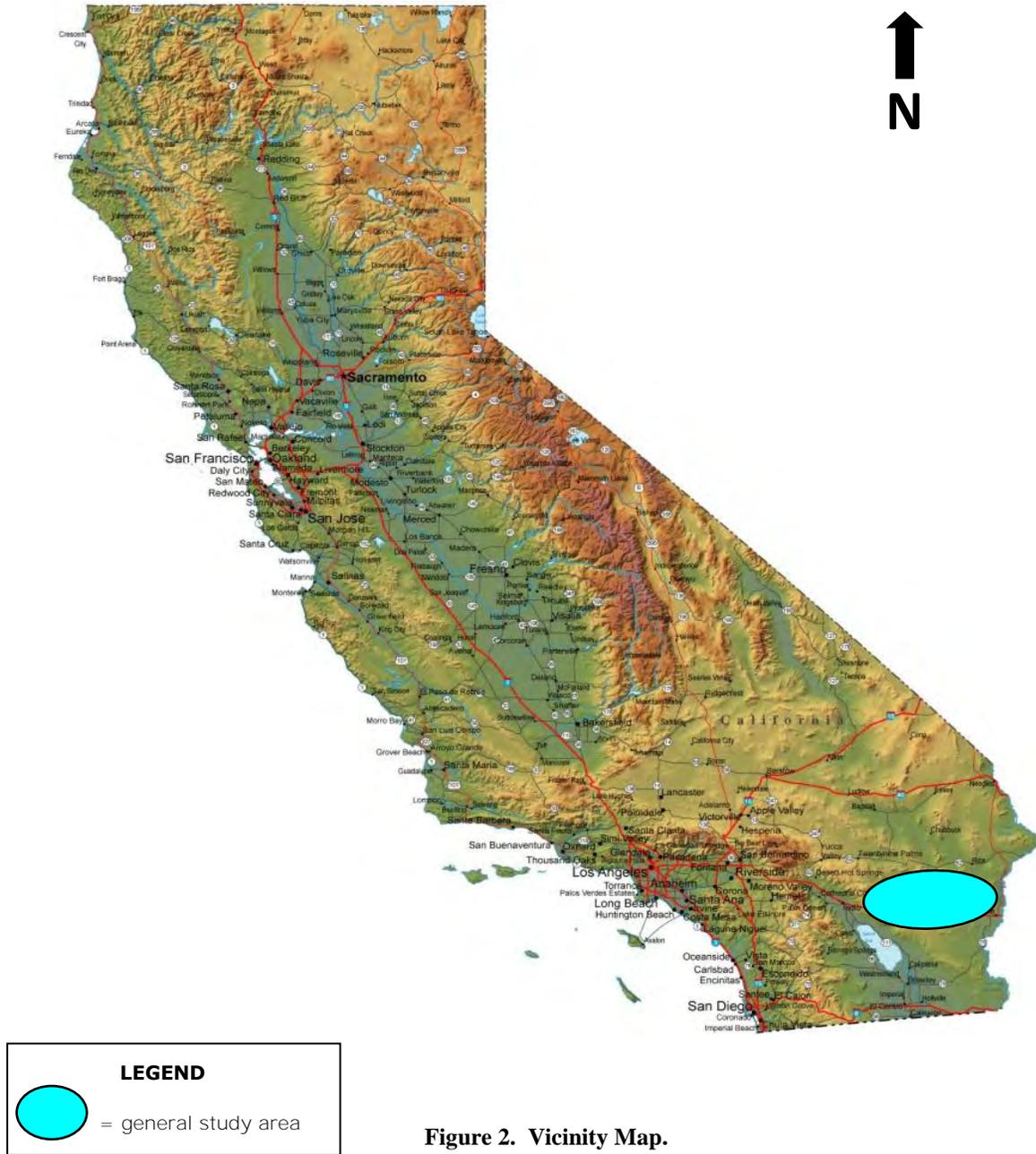
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WRI has learned, based on 22 years of helicopter and ground studies on Golden Eagles, that an initial helicopter survey can successfully identify approximately 80 to 90% of the Golden Eagle territories in a given area. Follow-up ground and helicopter surveys have indicated that some nests, and even some pairs, can be missed during the first survey. Second surveys are conducted to determine reproductive success but can also identify successful nesting attempts that were missed during initial surveys as well as reveal fledging success.

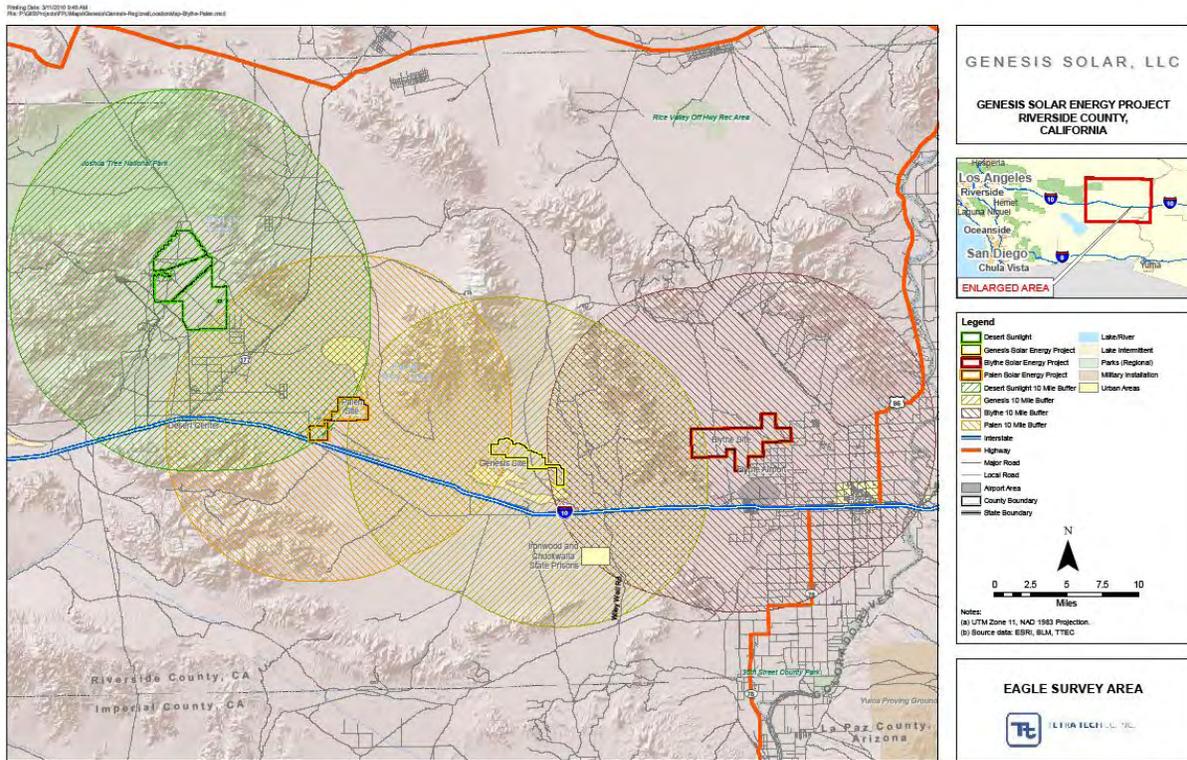
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## STUDY AREA

The study area is approximately 1,600 square miles and located in the Eastern Mojave Desert Region, near Blythe, California (Figures 2 and 3). It includes the Big Maria, Chuckwalla, Coxcomb, Eagle, Hodges, Little Chuckwalla, Little Maria, McCoy, Orocopia and Palen mountain ranges as well as the Chuckwalla Valley. It is mostly Creosote Scrub and Yucca-Cactus transitional habitat at the lower areas and Rocky Outcrops at the higher elevations. A portion of the northwest corner of the study area lies in Joshua Tree National Park.



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**Figure 3. Location Map.**  
 Provided by Tetra Tech EC.

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RESULTS

Waypoints and Related Data for Phase 1 & 2 Golden Eagle Surveys

Map coordinates (i.e., UTM, latitude/longitude) of the nests of sensitive species (Golden Eagles, Peregrine Falcons, Prairie Falcons) have been withheld per request of federal agencies in order to protect these species, but are on file at WRI. If needed, this information is available upon request.

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
<b>March 25, 2010 - 3 flights - 8 hours total time - sunny, 60-70F, 0% cloud cover, 10-20mph (gusts 30)                      Greg Matson (Cherry Helicopter), Dave Bittner, Chris Meador, Renée Rivard and James Newland</b>											
A	2	GE	SN	0		N	G	R	Y	2590 ft	
A	2	GE		2						2590 ft	1 Adult, 1 Juvenile (2-3yrs old), both flying
A	3	GO		1	11 S 667250 3703282						
A	4	GE	SN	0		N	G	R	N	1742 ft	White-wash, active within past 1-2 years
A	5	PR	CN	0							
A	6	RT	SN	1	11 S 672615 3703320						
A	7	RT		2	11 S 678332 3703623						
A	8	TV		2	11 S 684416 3706512						
A	9	BS		13	11 S 686764 3707857						
A	10	GF		1	11 S 687237 3707449						
A	11	TV		1	11 S 688183 3707327						
A	12	RT	SN	1	11 S 700787 3708538						
A	13	TV		1	11 S 704441 3711538						
A	14	CR		2	11 S 728470 3739803						
A	15	RT	SN	0	11 S 728245 3739710						
A	16	TV		1	11 S 723259 3739569						
A	17	RT	SN	1	11 S 724590 3736613						
A	18	RT	SN	0	11 S 722963 3738088						
A	19	RT	SN	0	11 S 722572 3738354						
A	20	TV		1	11 S 720861 3742407						
A	21	CR		1	11 S 718301 3741944						
A	22	TV		7	11 S 719778 3742009						

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Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
A	23	TV		2	11 S 717112 3745551						
A	24	TV		1	11 S 715330 3746501						
A	25	RT	SN	1	11 S 715833 3746132						
<b>A</b>	<b>26</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>S</b>	<b>G</b>	<b>R</b>	<b>Y</b>	<b>2291 ft</b>	<b>New material</b>
A	27	PR		1	11 S 719128 3742931						
A	28	RT		2	11 S 720506 3742963						
A	29	PR		1	11 S 723191 3744587						
A	30	TV		2	11 S 722285 3744640						
A	31	TV		1	11 S 719866 3745480						
A	32	RT	SN	1	11 S 718904 3745239						
A	33	TV		1	11 S 721221 3749138						
A	34	TV		1	11 S 720047 3750286						
A	35	TV		2	11 S 715527 3749421						
A	36	RT		1	11 S 715668 3749853						
A	37	TV		1	11 S 714351 3751971						
A	38	RT		1	11 S 720901 3738545						
A	39	RT		1	11 S 721677 3736862						
A	40	TV		1	11 S 702769 3725351						
A	41	TV		2	11 S 698969 3730661						
A	42	TV		3	11 S 698227 3732412						
A	43	TV		1	11 S 695855 3734624						
A	44	RT		1	11 S 691854 3741999						
A	45	TV		1	11 S 680296 3745393						
A	46	XX			11 S 681228 3745303					4236 ft	2 people on top of mountain
<b>A</b>	<b>47</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>G</b>	<b>R</b>	<b>Y</b>	<b>2871 ft</b>	
<b>A</b>	<b>47</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>F</b>	<b>R</b>	<b>N</b>	<b>2871 ft</b>	
A	48	BO		1	11 S 679262 3743327						

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Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
A	49	TV		1	11 S 673524 3740012						
A	50	SW		4	11 S 673730 3737044						
A	51	TV		2	11 S 680815 3736643						
A	52	PR		1	11 S 679400 3738066						
A	53	TV		2	11 S 692687 3752019						
A	54	GE	SN	0		W	P	R	N	2304 ft	Very old nest
<p><b>March 26, 2010 - 2 flights - 3.25 hours total time - sunny, 60-70F, 0% cloud cover, 10-20mph (gusts 25) Greg Matson (Cherry Helicopter), Dave Bittner, Chris Meador, Renée Rivard and James Newland</b></p>											
A	55	TV		2	11 S 701410 3726953						
A	56	GE	SN	0		N	P	R	N	1995 ft	Old nest
A	57	TV		1	11 S 701482 3728780						
A	58	PR		1	11 S 701384 3728507						
A	59	RT	SN	0	11 S 700953 3729303						
A	60	TV	SN	4	11 S 699424 3730628						
A	61	BO		1	11 S 699255 3731890						
A	62	TV		1	11 S 698035 3734351						
A	63	TV		1	11 S 696137 3736794						
A	64	TV		1	11 S 679558 3743536						
A	65	TV		1	11 S 679359 3743891						
A	66	BS		1	11 S 681492 3748791						
A	67	RT	SN	1	11 S 683795 3745287						
A	68	TV		2	11 S 681201 3746887						
A	69	TV		1	11 S 688509 3753576						
A	70	U	SN	0	11 S 690445 3754059						RT or CR
A	71	TV		4	11 S 696920 3750480						
A	72	TV		27	11 S 687150 3708280						
A	73	OS		1	11 S 680085 3707089						
A	74	CR		1	11 S 658668 3709520						

## FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
A	75	SW		1	11 S 651441 3710540						
<b>April 2, 2010 - 3 flights - 8 hours total time - sunny, 60-70F, 0% cloud cover, 10-20mph (gusts 30)                      Mel Cain (Utility Helicopters), Dave Bittner, Chris Meador, Jeff Lincer and James Newland</b>											
B	7	TV		1	11 S 642020 3718153					2718 ft	
B	8	PR		1	11 S 653303 3715103					3988 ft	
<b>B</b>	<b>9</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>P</b>	<b>R</b>	<b>N</b>	<b>4251 ft</b>	
B	10	RT		1	11 S 653970 3714917					4078 ft	
B	11	RT		1	11 S 654250 3714263					3790 ft	
B	12	PR		1	11 S 654731 3715403					3500 ft	
B	13	RT	SN	0	11 S 659445 3717029					2554 ft	
B	14	RT		1	11 S 662642 3714553					1938 ft	
B	15	GO		1	11 S 662754 3714446					1979 ft	
B	16	U	SN	0	11 S 662752 3712831					1953 ft	
B	17	U	SN	0	11 S 659333 3709116					2989 ft	
B	18	RT	SN	1	11 S 659600 3709430					2723 ft	
B	19	CR	SN	1	11 S 659436 3709019					2775 ft	
B	20	CR	SN	1	11 S 659363 3708994					2886 ft	
B	21	RT		1	11 S 662415 3709746					2537 ft	
B	22	GO		1	11 S 662558 3709721					2539 ft	
B	23	TV		1	11 S 686571 3715735					740 ft	
B	24	RT	SN	1	11 S 692408 3718791					738 ft	
B	25	CR	SN	1	11 S 693376 3718761					669 ft	
B	26	CR	SN	1	11 S 693936 3718749					654 ft	
B	27	RT	SN	1	11 S 696156 3718709					690 ft	
B	28	RT	SN	1	11 S 697117 3718684					678 ft	
B	29	CR	SN	1	11 S 698093 3718663					686 ft	
B	30	RT	SN	1	11 S 699799 3718614					682 ft	

## FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
B	31	RT	SN	1	11 S 700767 3718599					675 ft	
B	32	RT		1	11 S 701124 3718589					705 ft	
B	33	RT	SN	0	11 S 701534 3718577					729 ft	
B	34	TV		1	11 S 706791 3720210					682 ft	
B	35	CR		1	11 S 699445 3730661					2070 ft	
B	37	GO		1	11 S 698904 3732172					2187 ft	
B	38	TV		1	11 S 698331 3732692					2223 ft	
B	39	TV		1	11 S 695807 3732327					1519 ft	
B	40	BS		8	11 S 680286 3740495					2392 ft	4 ewes, 4 lambs
B	41	PR		1	11 S 679131 3737884					2438 ft	
B	42	CR		1	11 S 679422 3737056					2421 ft	
<b>B</b>	<b>43</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>P</b>	<b>R</b>	<b>N</b>	<b>2358 ft</b>	<b>Very old and deteriorated</b>
<b>B</b>	<b>44</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>G</b>	<b>R</b>	<b>N</b>	<b>2374 ft</b>	
B	45	TV		1	11 S 652926 3724110					2765 ft	
B	46	TV		2	11 S 655879 3722780					2749 ft	
B	47	BS		17	11 S 655396 3722833					2577 ft	
<b>B</b>	<b>49</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>NW</b>	<b>P</b>	<b>R</b>	<b>N</b>	<b>2129 ft</b>	<b>Very old nest</b>
B	50	TV		1	11 S 658348 3719724					2409 ft	
B	51	RT	SN	1	11 S 654124 3717344					2923 ft	
B	52	GO	SN	0	11 S 652559 3716143					2917 ft	
B	53	TV		4	11 S 645279 3714083					2812 ft	
B	54	RT		1	11 S 644502 3715767					3140 ft	
B	55	RT	SN	0	11 S 629635 3723912					2240 ft	
B	56	CR		1	11 S 629879 3723933					2329 ft	
B	57	GO		1	11 S 630051 3723944					2289 ft	
B	58	BO		1	11 S 629954 3723857					2269 ft	
B	59	RT	SN	0	11 S 629910 3723863					2290 ft	

## FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
B	60	RT	SN	0	11 S 629888 3723879					2320 ft	
B	61	TV		3	11 S 632877 3723811					2595 ft	
B	62	RT	SN	0						2406 ft	Old eagle nest
B	63	RT	SN	0	11 S 631576 3726195					1710 ft	
B	64	CR	SN	1	11 S 635034 3727085					1705 ft	
B	65	RT	SN	0	11 S 636475 3727490					1750 ft	
B	66	CR	SN	1	11 S 638150 3727981					1681 ft	
B	67	RT	SN	1	11 S 639102 3728242					1640 ft	
B	68	CR	SN	1	11 S 640455 3728633					1644 ft	
B	69	RT	SN	1	11 S 642154 3728890					1648 ft	
B	70	CR		1	11 S 643552 3727596					410 ft	
B	71	CR	SN	0	11 S 646375 3729340					368 ft	
B	72	CR	SN	0	11 S 648095 3729504					283 ft	
B	73	CR	SN	0	11 S 648427 3729532					264 ft	
B	73	CR	SN	0	11 S 648427 3729532					264 ft	
B	73	CR	SN	1	11 S 648427 3729532					264 ft	
B	74	CR	SN	1	11 S 654792 3729707					75 ft	
B	75	TV		4	11 S 652606 3728173					1544 ft	
B	76	RT		1	11 S 650926 3728067					1838 ft	
<b>B</b>	<b>77</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>G</b>	<b>R</b>	<b>Y</b>	<b>1730 ft</b>	
<b>B</b>	<b>77</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>G</b>	<b>R</b>	<b>Y</b>	<b>1730 ft</b>	
B	78	RT	SN	0	11 S 653196 3726487					1919 ft	
B	79	RT		1	11 S 652665 3725361					2406 ft	
B	80	CR		2	11 S 675633 3724513					872 ft	
B	81	RT	SN	0	11 S 689828 3718783					1841 ft	
B	82	RT	SN	1	11 S 688135 3718820					1818 ft	
B	83	CR		1	11 S 685885 3718876					1844 ft	

## FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
B	84	RT	SN	0	11 S 685398 3718885					1837 ft	
B	85	RT	SN	0	11 S 684995 3718891					1860 ft	
B	86	CR	SN	1	11 S 683926 3718911					1860 ft	
B	87	RT	SN	0	11 S 682577 3718880					1733 ft	
B	88	RT	SN	3	11 S 682479 3718975					1727 ft	
B	89	RT	SN	1	11 S 679313 3719036					1872 ft	
B	90	CR	SN	1	11 S 678657 3718925					1815 ft	
B	91	RT	SN	1	11 S 675844 3719714					1891 ft	
B	92	RT	SN	1	11 S 674828 3720387					1877 ft	
B	93	RT	SN	1	11 S 672230 3722116					1942 ft	
B	94	RT	SN	0	11 S 671267 3722754					1893 ft	
B	95	RT	SN	1	11 S 669654 3723813					1965 ft	
B	96	RT	SN	1	11 S 666347 3726017					2109 ft	
B	97	RT	SN	1	11 S 664785 3726648					2134 ft	
B	98	CR	SN	1	11 S 664343 3726785					2133 ft	
B	99	RT	SN	1	11 S 661846 3727513					2181 ft	
B	100	RT	SN	1	11 S 659792 3728145					2253 ft	
B	101	CR	SN	1	11 S 657255 3728905					2305 ft	
B	102	RT	SN	1	11 S 654497 3729720					2283 ft	
B	103	TV		2	11 S 648878 3726664					3586 ft	
B	104	BS		3	11 S 647584 3725931					3914 ft	Ewe with 2 lambs; 1 this year, 1 last year
B	105	RT	SN	1	11 S 647708 3726155					3799 ft	
B	106	TV		9	11 S 646897 3725798					3955 ft	
B	107	RT	SN	1	11 S 646594 3725193					4242 ft	
B	108	TV		1	11 S 644082 3727347					3217 ft	
B	109	TV		4	11 S 643370 3727706					3223 ft	

## FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
B	110	CR		2	11 S 642349 3727442					3352 ft	
B	111	XX			11 S 638987 3732043					2669 ft	Campers
B	112	CR	SN	0	11 S 635816 3732578					3520 ft	
B	113	RT	SN	0	11 S 635417 3732729					3867 ft	
<b>B</b>	<b>114</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>SE</b>	<b>F</b>	<b>R</b>	<b>N</b>	<b>3816 ft</b>	
B	115	TV		2	11 S 636252 3734790					3903 ft	
B	116	RT	SN	1	11 S 632886 3742473					4553 ft	
B	116	RT	SN	0	11 S 632886 3742473					4553 ft	
B	117	BS		2	11 S 635563 3741933					3888 ft	2 rams
<b>B</b>	<b>118</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>P</b>	<b>R</b>	<b>N</b>	<b>3938 ft</b>	<b>Abandoned; rocks collapsed in nest</b>
B	119	RT	SN	1	11 S 636495 3741903					3840 ft	
B	120	RT		1	11 S 637779 3741892					3724 ft	
B	121	RT	SN	0	11 S 637450 3741313					3772 ft	
B	122	RT	SN	1	11 S 637801 3741430					3580 ft	
B	123	RT	SN	0	11 S 637924 3741346					3456 ft	
B	123	RT	SN	0	11 S 637924 3741346					3456 ft	
B	123	RT	SN	0	11 S 637924 3741346					3456 ft	
<b>B</b>	<b>124</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>G</b>	<b>R</b>	<b>Y</b>	<b>2878 ft</b>	<b>New material</b>
B	125	CR	SN	0	11 S 640017 3740909					2892 ft	
B	126	TV		1	11 S 642581 3741544					2684 ft	
B	127	TV		1	11 S 646316 3744015					2348 ft	
B	128	SW		14	11 S 652225 3747290					3611 ft	
<b>April 3, 2010 - 2 flights - 7 hours total time - sunny, 57-68F, 0% cloud cover, 0-5mph Mel Cain (Utility Helicopters), Dave Bittner, Chris Meador, Jeff Wells and James Newland</b>											
C	1	CR		1	11 S 700662 3730567						
C	2	TV		4	11 S 699177 3731581						
C	3	TV		1	11 S 697036 3735597						
C	4	TV		2	11 S 679927 3743499						

FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
C	5	TV		1	11 S 679599 3744151						
C	6	GE	SN	0		N	G	R	N	2745 ft	
C	7	TV		2	11 S 657348 3746616						
C	8	TV		2	11 S 656795 3747805						
C	9	TV		2	11 S 655377 3747926						
C	10	GE	SN	0		N	G	R	N	2410 ft	
C	11	RT		1	11 S 650663 3771176						
C	12	GE	SN	1		NE	G	R	Y	3013 ft	
C	13	GE	SN	0		E	P	R	N	2827 ft	Dead adult Golden Eagle in nest
C	14	GE	SN	0		NE	P	R	N	2697 ft	
C	15	RT		1	11 S 650811 3767316						
C	16	TV		1	11 S 651973 3766498						
C	17	GE	SN	0		N	F	R	N	2227 ft	
C	18	RT		1	11 S 653487 3766710						
C	19	RT	SN	0	11 S 655494 3765222						
C	20	BS		6	11 S 655698 3765206						
C	21	RT		1	11 S 654872 3763739						
D	1	RT	SN	0	11 S 652617 3765076						
D	2	TV		2	11 S 651448 3764841						
D	3	TV		2	11 S 652681 3762313						
D	4	GE	SN	0		S	F	R	N	2796 ft	
D	5	GE	SN	0		N	P	R	N	2692 ft	
D	6	RT	SN	0	11 S 653466 3761205					2745 ft	
D	7	RT		1	11 S 654807 3759330					2398 ft	
D	8	RT		1	11 S 655681 3759171					2047 ft	
D	9	RT	SN	0	11 S 656266 3758798					1936 ft	
D	10	RT	SN	0	11 S 655288 3753305					1548 ft	
D	11	U	SN	0	11 S 654489 3751840					1704 ft	Medium-sized nest, not eagle
D	12	U	SN	0	11 S 654240 3751516					1797 ft	Medium-sized nest, not eagle

# FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
D	13	RT	SN	0	11 S 649612 3747692					1059 ft	
D	14	RT	SN	0	11 S 649098 3747212					1014 ft	
D	15	RT	SN	0	11 S 648147 3746365					950 ft	
D	16	RT	SN	0	11 S 645055 3743538					1065 ft	
D	17	RT	SN	0	11 S 643878 3742455					1167 ft	
D	18	CR		2	11 S 637036 3743636					2110 ft	
D	19	RT		1	11 S 641635 3753055					2065 ft	
D	20	PR	CN	1						2215 ft	
D	21	CR	SN	0	11 S 632851 3752155					2080 ft	
D	22	CR	SN	1	11 S 590199 3722945					1387 ft	
D	22	RT	SN	1	11 S 590199 3722945					1387 ft	
D	25	RT	SN	0	11 S 618063 3730295					2628 ft	
D	26	RT	SN	1	11 S 618087 3730327					2656 ft	
D	27	XX		2	11 S 629062 3731887					3050 ft	CH chasing RT
D	28	TV		4	11 S 633746 3732586					2587 ft	
D	29	TV		1	11 S 635426 3734867					3178 ft	
D	30	BS		1	11 S 634744 3735247					3375 ft	
D	31	TV		1	11 S 631536 3742823					3555 ft	
<b>D</b>	<b>32</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>G</b>	<b>R</b>	<b>N</b>	<b>1946 ft</b>	
D	33	RT	SN	0	11 S 631164 3751489					1938 ft	
<b>D</b>	<b>34</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>N</b>	<b>F</b>	<b>R</b>	<b>N</b>	<b>1955 ft</b>	
<b>D</b>	<b>35</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>W</b>	<b>G</b>	<b>R</b>	<b>Y</b>	<b>1953 ft</b>	
D	36	PR	CN	1						1822 ft	
D	37	TV		2	11 S 630417 3752931					1779 ft	
D	38	PR	CN	0						2664 ft	
D	40	LO	CN	1						3054 ft	
<b>D</b>	<b>41</b>	<b>GE</b>		<b>1</b>						<b>3236 ft</b>	<b>Flying</b>
D	42	CR	SN	0	11 S 648734 3769587					3481 ft	
<b>D</b>	<b>43</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>W</b>	<b>P</b>	<b>R</b>	<b>N</b>	<b>3941 ft</b>	
<b>D</b>	<b>44</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>W</b>	<b>P</b>	<b>R</b>	<b>N</b>	<b>3640 ft</b>	
<b>D</b>	<b>45</b>	<b>GE</b>	<b>SN</b>	<b>0</b>		<b>E</b>	<b>G</b>	<b>R</b>	<b>Y</b>	<b>3571 ft</b>	<b>New material</b>

FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
D	46	GE	SN	0		N	F	R	N	3350 ft	
D	47	RT	SN	1	11 S 649960 3758231					1967 ft	
D	48	RT		1	11 S 650982 3755135					2472 ft	
D	49	TV		3	11 S 651319 3754184					2737 ft	
D	50	GE	SN	0		NW	G	R	Y	2709 ft	
D	51	GE	SN	0		SW	G	R	N	2175 ft	
D	52	CR	SN	0	11 S 653781 3748950					2218 ft	
D	53	GE	SN	0		E	G	R	N	2346 ft	
D	54	RT	SN	0	11 S 655272 3746829					2299 ft	
D	55	U	SN	0	11 S 655197 3746698					2259 ft	Medium-sized nest
D	56	TV		1	11 S 655659 3746334					2311 ft	
D	57	SW		1	11 S 641400 3721582					3709 ft	
<b>April 17, 2010 - Subsequent Field Observation</b>											
E	1	GE		1	Chuckwalla Valley						Visual observation
<b>May 14, 2010 2 Flights - 4hr 15min, 87-95F, 0% cloud cover, 10+ vis, wind 5-10mph SW Mel Cain (Utility Helicopters), Dave Bittner, Chris Meador, Renée Rivard</b>											
J	26	RT	SN	0	11 S 637611 3740408	N	G	R	N	2270 ft	
J	27	CR	SN	0	11 S 639937 3740894	N	G	R	Y	1778 ft	
J	28	RT	SN	0	11 S 640019 3740886	N	G	R	N	1789 ft	
J	28	CR	SN	0	11 S 640019 3740886	N	G	R	N	1789 ft	Found in same area as RTSN at #28
J	-	GE	SN	0		N	G	R	Y	2878 ft	Returned to Phase 1 waypoint B124 GESN, new nest activity, inactive
J	29	GE	SN	0		N	G	R	N	1943 ft	
J	30	GE	SN	0		N	G	R	N	1942 ft	
J	31	RT	SN	0	11 S 630844 3751896	W	G	R	N	1949 ft	
J	32	PR	CN	2		W	G	R	Y	1815 ft	Adult with young
J	-	GE	SN	0		N	G	R	Y	1953 ft	Returned to Phase 1 waypoint D35 GESN, no new nest activity, inactive
J	33	RT	SN	2	11 S 641880 3753067	NE	G	R	Y	1991 ft	Adult with young
J	34	GE	SN	0		NW	G	R	Y	2644 ft	Same nest as Phase 1 D50 GESN
J	35	RT		1	11 S 653762 3748448					2050 ft	Flying
J	36	GE	SN	0		W	G	R	Y	3519 ft	Same nest as Phase 1 D45 GESN
J	37	GE	SN	2		N	G	R	Y	3017 ft	2 chicks 5 weeks old, same nest as Phase 1 waypoint C12 GESN

FINAL REPORT

Trip ID	Waypoint	Species	Nest Type*	# of Individuals	Position (UTM)	Aspect	Nest Condition	Substrate	2010 Active Nest (Yes/No)	Elevation	Notes (age, sex, behavior, etc.)
J	38	GE	SN	0		N	G	R	Y	2941 ft	2 nests at this location, no new activity, same nest as Phase 1 waypoint A47 GESN
J	38	GE	SN	0		N	F	R	N	2941 ft	2 nests at this location, no new activity, same nest as Phase 1 waypoint A47 GESN
J	39	PR	CN	2		N		R	Y	2839 ft	2 adults flying around cavity nest, white wash
J	40	GE	SN	0		W	G	R	Y	2303 ft	Fresh material added, same nest as Phase 1 waypoint A26 GESN
J	41	RT		1	11 S 704339 3721364			TT		850 ft	Perched
J	42	RT	SN	0	11 S 695531 3721195		G	TT		835 ft	
J	43	RT		1	11 S 692193 3720436			TT		756 ft	Perched
J	44	RT		1	11 S 686871 3720185			TT		720 ft	Perched
J	45	RT	SN	2	11 S 674743 3720563		G	TT		821 ft	1 adult with at least 1 young
J	46	RT		1	11 S 673341 3721505			TT		912 ft	Perched
J	47	RT	SN	0	11 S 672159 3722289		P	TT		845 ft	
J	48	RT	SN	0	11 S 671376 3722807		P	TT		902 ft	
J	49	RT	SN	0	11 S 669623 3723956		P	TT		950 ft	
J	50	GO		1	11 S 651425 3728319					1757 ft	Flying
J	51	CR	SN	0	11 S 651555 3728379	N	G	R		1722 ft	
J	52	GE	SN	0		N	G	R	Y	1942 ft	2 nests at this location, no new GE activity, same nest as Phase 1 waypoint B77 GESN
J	52	GE	SN	0		N	G	R	Y	1942 ft	2 nests at this location, no new GE activity, same nest as Phase 1 waypoint B77 GESN
J	53	GE	SN	0		N	G	R	Y	2593 ft	No new GE activity, same nest as Phase 1 A2 GESN

BO=Barn Owl, BS=Bighorn Sheep, CH=Cooper’s Hawk, CN=Cavity Nest, CR=Common Raven, F=Fair, G=Good, GE=Golden Eagle, GF=Grey Fox, GO=Great Horned Owl, LO=Long-eared Owl, OS=Osprey, P=Poor, PR=Prairie Falcon, R=Rock, RT=Red-tailed Hawk, SN=Stick Nest, SW=Swainson’s Hawk, TT=Transmission Tower, TV=Turkey Vulture, U=Unidentified, XX=Other  
 \*If no nest type is indicated, then the species was observed independently of a nest (e.g., flying, perched).

Table 1. Data from Phase 1 and Phase 2 Surveys.

# PHASE 1 REPORT

## PHASE 1 REPORT

### EXECUTIVE SUMMARY – PHASE 1 SURVEYS

This section reports on findings of the **Phase 1** surveys conducted in Eastern Mojave Desert Region, California, to record and report occupancy for Golden Eagles within 10 miles of the boundaries of 4 proposed solar developments in order to comply with the U.S. Fish and Wildlife Service recommendations. Eleven mountain ranges and the transmission towers of 1 valley were surveyed by helicopter between and around Blythe and Desert Center, California. Fourteen Golden Eagle territories were identified containing a combined 34 nests. Nine of the 14 territories were considered active in 2010 and one of these was found with an incubating female; 5 territories were considered to be inactive. Besides 5 Golden Eagles, 12 other species were seen (i.e., Barn Owl, Bighorn Sheep, Common Ravens, Cooper’s Hawk, Great Horned Owls, Grey Fox, Long-eared Owl, Osprey, Prairie Falcons, Red-tailed Hawks, Swainson’s Hawk, and Turkey Vultures) totaling 338 wildlife documentations. All sightings have been documented with GPS locations and recorded on maps and tables as recommended in the USFWS Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance.

## PHASE 1 REPORT

### METHODS AND CONSTRAINTS

#### Methods

For this survey, WRI attempted to determine which Golden Eagle territories were active, even in the absence of incubating females, by evidence at the nest sites. Observations such as fresh green branches, material placed in the nest bowl such as yucca, and signs of new nest sticks built into and above old nest material all helped assess activity at the nest site during 2010. We contacted Dr. Larry LaPre, of the BLM, to request available historic records or reports of Golden Eagle nesting activity and/or sightings in the project area. WRI utilized the verbal information provided by Dr. LaPre to improve our survey focus. Surveys conducted over the Joshua Tree National Park required permits from the National Park Service, which were acquired.

It should be noted that all surveying and reporting complies with the current U.S. Fish and Wildlife Service Interim Golden Eagle Inventory and Monitoring Protocols released in 2010 (Pagel et al. 2010).

#### Survey

On March 25-26 and April 2-3, 2010, we conducted helicopter surveys for the target species, Golden Eagle. We used Hughes-500 helicopters that provided seating for three wildlife biologists (including at least 2 Golden Eagle biologists, one of whom also had extensive Bighorn Sheep experience) and the pilot. Both pilots used by WRI for these surveys have extensive Golden Eagle and Bighorn Sheep experience (Appendix A). Due to the overlap of Golden Eagle nesting and Bighorn Sheep lambing seasons, California Fish and Game requested that an experienced Bighorn Sheep biologist accompany all flights. We spent approximately 75 person-hours of actual aerial observations during the helicopter surveys for this phase. The biologists conducting Phase 1 surveys were Dave Bittner, Dr. Jeff Lincer, Chris Meador, Dr. Renée Rivard, James Newland; pilots were Dr. Greg Matson and Mel Cain.

We concentrated on any area with suitable Golden Eagle nesting habitat with possible nesting substrate which included cliffs with geological features, such as flat ledges or shallow cavities/caves, that could allow for safe nest construction and which were high enough to provide protection from ground-dwelling predators. This survey included all or part of every mountain range in the study area; areas initially observed to be without suitable Golden Eagle nesting habitat were not further surveyed. We also surveyed large transmission towers in the project area since Golden Eagles are known to nest on these types of structures and WRI has documented this activity in other parts of the Mojave Desert.

#### GPS

Nest site and other location-specific data were determined and documented using hand-held GPS units (Garmin Map60GSx). A sequential number was assigned to each observation that corresponded to the GPS waypoint. Waypoints were recorded using the UTM grid in the WGS 84 Datum. GPS was also used to track our survey routes. Handwritten notes were taken on field forms that documented species, detailed observations, and corresponded to each GPS waypoint.

## PHASE 1 REPORT

### Photography

Photographs were taken with Nikon equipment with GPS units attached so that latitude and longitude could be recorded on each digital picture. Two cameras were used; one for recording wide-angle shots (18-200mm optically-stabilized zoom lens) and another for recording close-ups (200-400mm optically-stabilized zoom lens). The 400mm zoom lens plus the ability to enlarge the digital photographs allows accurate and detailed records to be captured with minimal disturbance to wildlife. This is also important because it allows review and confirmation of our observations in an environment that is more stable than the cockpit of a helicopter.

### Data

We photographed all active Golden Eagle nests, some other raptor nests, representations of numerous inactive Golden Eagle nest sites, and significant other wildlife species observed. The following data were also specifically collected and are on file at WRI but map coordinates for nests of sensitive species (i.e., Golden Eagle, Peregrine Falcon, and Prairie Falcon) may not be included in all reports:

- Species
- Number of nests/alternative nests observed
- Condition of each nest and whether or not it was active
- Nest aspect
- Nest elevation
- Nest GPS coordinates
- Nest substrate (cliff, transmission tower, etc.)
- Age class of Golden Eagles and other species, if determinable
- Behavior of species observed.

It should be noted that Red-tailed Hawks (*Buteo jamaicensis*) in particular, as well as other raptors such as Prairie Falcons (*Falco mexicanus*), sometimes utilize Golden Eagle nests for their own nesting, something observed during surveys for this project. During surveys, these nests were attributed to the current occupant (i.e., hawk or falcon), however the original nest builder (i.e., Golden Eagle) was recorded in the Notes section of the transect data sheet (Table 1).

## PHASE 1 REPORT

### **Nest Condition**

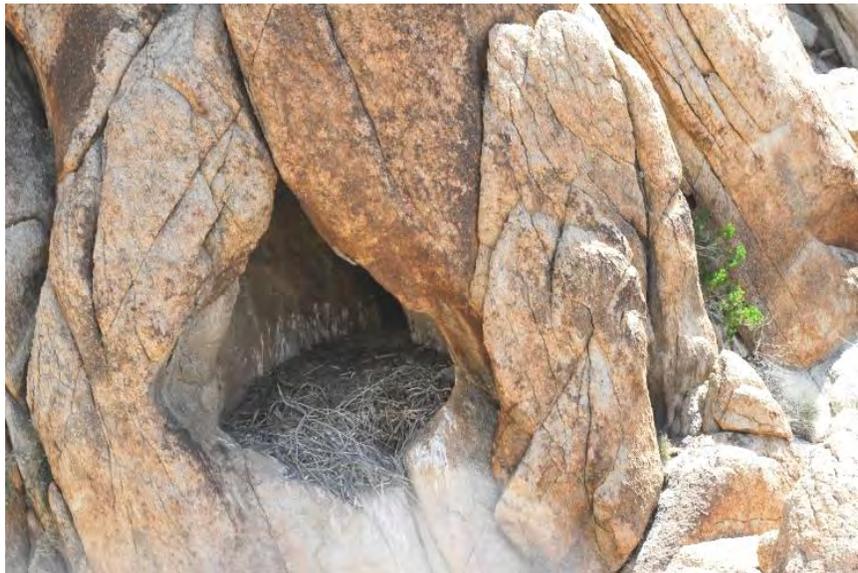
The nest condition is an important indicator of how recently the nest has been used and whether the nest should be considered "active." The following provides the basis for categorizing that condition.

**Good condition** - A Golden Eagle nest in **good condition** has been worked on in the current year or within the past 1 to 3 years; a determination made by observing the age of sticks or recent addition of other materials that make up the nest. Additionally, the presence of a bowl constructed with yucca, with or without new material, is indicative of recent activity and good condition.



**Example of a nest in good condition**

**Fair condition** – A Golden Eagle nest in **fair condition** has not been used for several years, shows moderate signs of weathering, and may or may not include a rough bowl.



**Example of a nest in fair condition**

## PHASE 1 REPORT

**Poor condition** – A Golden Eagle nest in **poor condition** shows extensive and clear signs of weathering, is in the process of deteriorating, and can often even be decomposing.



**Example of a nest in poor condition**

### **Nest Activity**

**Active nest** - An **active nest** is a nest in good condition that has evidence of new material having been added during the season in which the survey has been conducted. It will include the use of yucca and often includes the construction of a bowl, used for incubation. An active nest may or may not be **occupied** by a Golden Eagle (e.g., an incubating female or a young bird) at the time of survey.



**Example of an active nest with new material in bowl**

## PHASE 1 REPORT

**Occupied nest** – An **occupied nest** is an active nest in which an adult or young Golden Eagle, or a new egg, has been observed during the survey.



**Example of an occupied nest with an incubating female Golden Eagle**

### **Nest Arrangement**

**Multiple nests at one waypoint** – Golden Eagles often construct nests in close proximity to one another. During surveys, these nests are often recorded at a single waypoint for graphic clarity and readability.



**Example of multiple (2) nests in close proximity marked by a single waypoint**

## PHASE 1 REPORT

### Constraints

In that these were diurnal surveys focused on Golden Eagles, we were less likely to observe nocturnal and crepuscular raptors (i.e., owls) or nocturnal mammals. Aerial surveys also tend to under-represent the smaller species, like the American kestrel (*Falco sparverius*) and burrowing owl (*Athene cunicularia*). No population data can be extrapolated from these surveys except for the focus species, Golden Eagle.

The release of the Interim Golden Eagle Technical Guidance in February and subsequent contracts being finalized in March resulted in survey flights being scheduled late in the Golden Eagle breeding season. Initiating surveys this late in the season may have resulted in missed observations of adult eagles on territory earlier in the year (December-February) that attempted to nest but failed or that did not attempt to produce young.

## RESULTS

### Golden Eagles

We observed a total of 34 Golden Eagle nests in the study area that represented 14 Golden Eagle territories (Figure 4). The nests were in various conditions and some may not have been used for many years. It is important to note that many of the nests are alternative nest sites for the same territory.

We documented 9 of these territories to be active this year and 5 inactive; a number of these inactive territories have apparently been active within the last 2-3 years based on nest condition and white wash. One of the active Golden Eagle territories (Coxcomb Mountains NE) was found with an incubating female. We will return in May to conduct Phase 2 of the survey and document if the incubating pair was successful and also if any of the other active territories successfully produced young from nests not initially found.

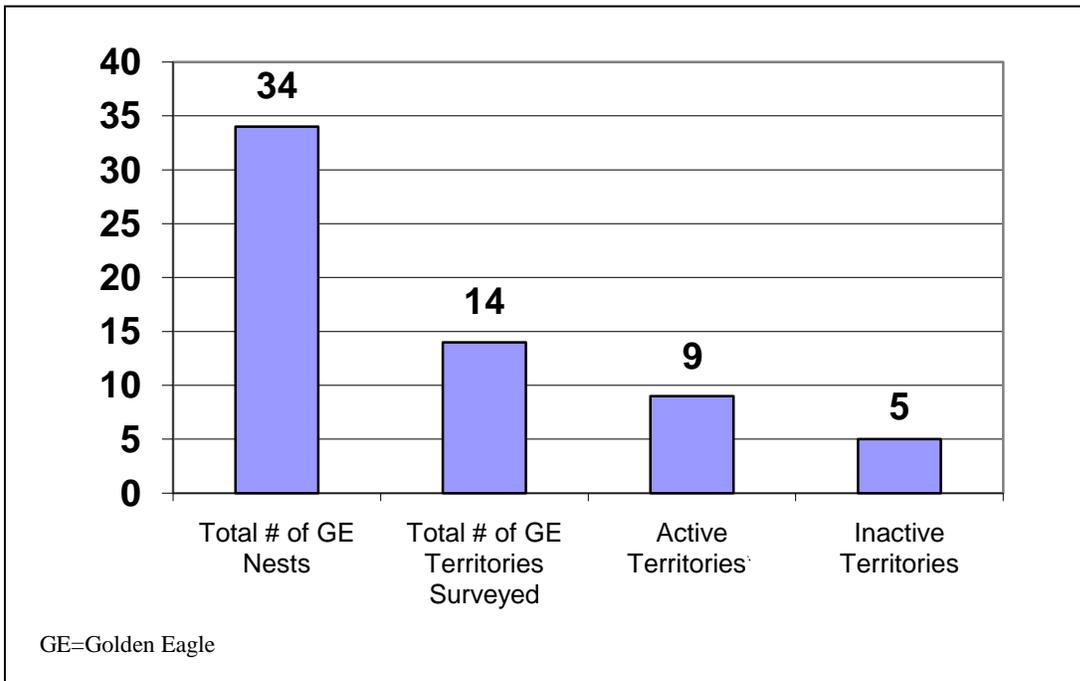


Figure 4. Phase 1 Golden Eagle Territory Data for Eastern Mojave Desert Region Study Area.

## PHASE 1 REPORT

Based on recommendations in the USFWS Interim Golden Eagle Guidelines (Pagel et al. 2010), all wildlife observations are documented below in Table 2.

Species	Big Maria Mtns	Chuckwalla Mtns	Chuckwalla Valley	Coxcomb Mtns	Eagle Mtns	Hodges Mtns	Little Chuckwalla Mtns	Little Maria Mtns	McCoy Mtns	Orocopia Mtns	Palen Mtns	Species Totals
Barn Owl									1	1	1	3
Bighorn Sheep		20		6	3		13				9	51
Common Raven	3	10	9		2				2	2	1	29
Cooper's Hawk					1							1
Golden Eagle			1	2						2		5
Great Horned Owl		2					1		1	1		5
Grey Fox							1					1
Long-eared Owl				1								1
Osprey							1					1
Prairie Falcon	2	2			2				1		2	9
Red-tailed Hawk	8	15	19	8	7	1	3		1		1	63
Swainson's Hawk		2		14							4	20
Turkey Vulture	20	29	1	15	8	1	31	7	23	3	11	149
Species Totals	33	80	30	46	23	2	50	7	29	9	29	338

**Table 2. Phase 1 – All Wildlife Observed During Phase 1 Surveys.**

PHASE 1 REPORT

Additionally, all nests with their associated species were also recorded and are provided below in Table 3.

Species	Big Maria Mtns	Chuckwalla Mtns	Chuckwalla Valley	Coxcomb Mtns	Eagle Mtns	Hodges Mtns	Little Chuckwalla Mtns	Little Maria Mtns	McCoy Mtns	Orocopia Mtns	Palen Mtns	Totals
Common Raven nest		4		2	3							9
Common Raven nest (incubating)		6	7							1		14
Golden Eagle nest (inactive)		4		11	4		1	1	1		1	23
Golden Eagle nest (active, not occupied)	1	2		2	2					1	2	10
Golden Eagle nest (incubating)				1								1
Great Horned Owl nest		1										1
Long-eared Owl nest (incubating)				1								1
Prairie Falcon cavity nest				1			1					2
Prairie Falcon cavity nest (incubating)					2							2
Red-tailed Hawk nest	3	2	11	6	8				1	5		36
Red-tailed Hawk nest (incubating)	3	8	16	1	4	1	1				1	35
Unidentified nest		2		3				1				6
Totals	7	29	34	28	23	1	3	2	2	7	4	140

Table 3. Phase 1 – Golden Eagle and All Other Nests Observed During Phase 1 Surveys.

PHASE 1 REPORT

Table 4 lists the trip ID, waypoint identification number for each Golden Eagle nest identified, the status of nest activity (i.e., active or not and whether an incubating female was observed), the territory name (incorporating the state, county, and US Geological Survey [USGS] Quad; the USFWS recommended naming convention), and the geographical area where the nest was located. Active territories are highlighted in yellow; bold type indicates an incubating eagle was observed.

Territory	Trip	Waypoint	Active	USGS Site Name	Geographic Area
1	B	9	N	CA-RIV-33115/E3-001-01	Chuckwalla Mtns S
1	B	49	N	CA-RIV-33115/E3-002-01	Chuckwalla Mtns S
2	A	26	Y	CA-RIV-33114/G6-001-01	Big Maria Mtns
3	A	2	Y	CA-RIV-33115/E5-001-01	Chocolate Mtns N
4	B	43	N	CA-RIV-33115/F3-001-01	Chuckwalla Mtns N
4	B	44	N	CA-RIV-33115/F3-001-02	Chuckwalla Mtns N
4	B	77	Y	CA-RIV-33115/F3-001-03	Chuckwalla Mtns N
4	B	77	Y	CA-RIV-33115/F3-001-04	Chuckwalla Mtns N
5	D	4	N	CA-RIV-33115/H3-001-01	Coxcomb Mtns CW
5	D	5	N	CA-RIV-33115/H3-001-02	Coxcomb Mtns CW
5	D	43	N	CA-RIV-34115/A4-001-01	Coxcomb Mtns CW
5	D	44	N	CA-RIV-34115/A4-001-02	Coxcomb Mtns CW
5	D	45	Y	CA-RIV-34115/A4-001-03	Coxcomb Mtns CW
5	D	46	N	CA-RIV-34115/A4-001-04	Coxcomb Mtns CW
6	C	10	N	CA-SBD-34115/A3-001-01	Coxcomb Mtns NE
6	C	12	Y-Inc	CA-SBD-34115/A3-001-02	Coxcomb Mtns NE
6	C	13	N	CA-SBD-34115/A3-001-03	Coxcomb Mtns NE
6	C	14	N	CA-SBD-34115/A3-001-04	Coxcomb Mtns NE
6	C	17	N	CA-SBD-34115/A3-001-05*	Coxcomb Mtns NE
7	D	50	Y	CA-RIV-33115/G3-001-01	Coxcomb Mtns SW
7	D	51	N	CA-RIV-33115/G3-001-02	Coxcomb Mtns SW
7	D	53	N	CA-RIV-33115/G3-001-03	Coxcomb Mtns SW
8	D	32	N	CA-RIV-33115/H5-001-01	Eagle Mtns N
8	D	34	N	CA-RIV-33115/H5-001-02	Eagle Mtns N
8	D	35	Y	CA-RIV-33115/H5-001-03	Eagle Mtns N
9	B	114	N	CA-RIV-33115/F5-001-01	Eagle Mtns S
10	A	4	N	CA-RIV-33115/D1-001-01	Little Chuckwalla Mtns
11	A	54	N	CA-RIV-33114/G7-001-01	Little Maria Mtns
12	A	56	N	CA-RIV-33114/F7-001-01	McCoy Mtns
13	A	47	Y	CA-RIV-33115/G1-001-01	Palen Mtns
13	A	47	Y	CA-RIV-33115/G1-001-02	Palen Mtns
13	C	6	N	CA-RIV-33115/G1-001-03	Palen Mtns
14	B	118	N	CA-RIV-33115/G5-001-01	Eagle Mtns C
14	B	124	Y	CA-RIV-33115/G5-001-02	Eagle Mtns C

Inc=Incubating, N=No, RIV=Riverside, SBD=San Bernardino, Y=Yes.

\*Based on the USFWS recommended naming convention, the territory name is based on the location of the first nest observed. For the territory noted in this table, the first 4 nests observed were in San Bernardino County while nest 5 was in Riverside County but retains San Bernardino County in its USGS Quad name.

**Table 4. Phase 1 - All Golden Eagle Territories with USGS Quad Territory Names.**

PHASE 1 REPORT

**Big Maria Mountains**



**An active Golden Eagle nest (A26GESN-0); good condition, new material this season.**



**A detailed photograph of the above Golden Eagle nest (A26GESN-0).**

PHASE 1 REPORT

Chuckwalla Mountains - North



**An inactive Golden Eagle nest (B44GESN-0); good condition.**



**An active Golden Eagle nest (B77GESN-0); good condition, 1 of 2 nests at this location.**

PHASE 1 REPORT

**Chuckwalla Mountains - South**



**An inactive Golden Eagle nest (B49GESN-0). Poor condition, very old nest.**

## PHASE 1 REPORT

### **Chocolate Mountains - North**

Two Golden Eagles were observed flying near the nest site during this survey; 1 adult and 1 juvenile approximately 2 to 3 years of age. This territory is outside of the required survey boundaries but is included since Golden Eagles were found during the flights.

PHASE 1 REPORT

Coxcomb Mountains - Northeast



**An incubating Long-eared Owl in old Prairie Falcon cavity nest (D40LOCN-1).**



**An inactive Golden Eagle nest (C13GESN-0); poor condition, adult Golden Eagle carcass in nest.**

PHASE 1 REPORT

Coxcomb Mountains - Northeast



**An active Golden Eagle nest (C12GESN-1) with an incubating female.**



**View of Bighorn Sheep (C20BS-6), 5 of 6 rams observed.**

PHASE 1 REPORT

Coxcomb Mountains – Central West



**An inactive Golden Eagle nest (D46GESN-0); fair condition.**



**An active Golden Eagle nest (D45GESN-0); good condition.**

PHASE 1 REPORT

Coxcomb Mountains - Southwest



**An inactive Golden Eagle nest (D53GESN-0); good condition.**



**An active Golden Eagle nest (D50GESN-0); good condition.**

PHASE 1 REPORT

**Eagle Mountains - North**



**An incubating Prairie Falcon in cavity nest (D36PRCN-1).**



**An active Golden Eagle nest (D35GESN-0); good condition.**

PHASE 1 REPORT

**Eagle Mountains - North**



**An inactive Golden Eagle nest (D32GESN-0); good condition.**

PHASE 1 REPORT

**Eagle Mountains – Central**



**An active Golden Eagle nest (B124GESN-0); good condition, new material in bowl.**



**An inactive Golden Eagle nest (B118GESN-0); poor condition, likely abandoned due to rock collapse.**

PHASE 1 REPORT

**Eagle Mountains - South**



**An inactive Golden Eagle nest (B114GESN-0); fair condition.**

PHASE 1 REPORT

**Hodges Mountains**



**An incubating Red-tailed Hawk on a transmission tower nest (A12RTSN-1).**

PHASE 1 REPORT

**Little Chuckwalla Mountains**



**An inactive Golden Eagle nest (A4GESN-0); good condition and likely active within past 1-2 years.**

PHASE 1 REPORT

**McCoy Mountains**



**An inactive Golden Eagle nest (A56GESN-0); poor condition.**

## PHASE 1 REPORT

### **Orocopia Mountains**

A survey of this entire mountain range was not deemed necessary since the habitat was marginally sufficient to support Golden Eagles and did not provide adequate Golden Eagle nesting substrate. Only the eastern portion of the Mountains were in the 10-mile survey area surrounding the projects so this was the only portion surveyed.

PHASE 1 REPORT

**Palen Mountains**



**View of 1 of 2 Golden Eagle nests (A47GESN-0) at this waypoint in the Palen Mountains.**

## PHASE 1 REPORT

### DISCUSSION OF FINDINGS

When evaluating the data from this 2010 Phase 1 survey, it is important to take the recent drought and its effects on Golden Eagle reproduction into account. The California Department of Water Resources advises that the state is entering its fourth year of serious drought as a result of below average precipitation and run-off since the fall of 2006 (State of California 2010). Reproductive success is a dynamic factor, dependent on a number of covariates, and without the context of knowing the effects of the drought on Golden Eagle breeding, one might come to a false conclusion about the population status of Golden Eagles in the study area. Because breeding in Southern California starts in January and this study was initiated in late March when only those eagles that were successful would be incubating, no opportunity was afforded to actually get a reasonable estimate of the number of Golden Eagle pairs that attempted to reproduce but failed. Therefore, the number of active territorial pairs of Golden Eagles in the study area could be higher than those actually identified.

Because prohibition against take and the new regulations apply not only to nest sites but also include foraging areas, a circle with an approximate 5-mile radius (approximately 78 square miles) has been placed around the Golden Eagle core nesting areas on the survey maps to reflect estimated foraging habitat. This is for planning purposes only. Although we have applied the approximate 5-mile radius to indicate suitable foraging area in favorable habitat, most desert-nesting Golden Eagles actually have much larger territories. This 5-mile radius should serve for reference only to aid in the initial visualization of Golden Eagle habitat use and does not imply this is the actual territory. "Core nesting areas" and "territories" of Golden Eagles imply the home territory of one pair of Golden Eagles. Core nesting areas can contain multiple nests, which are usually within one-half mile of each other or are visually in line of sight of each other. Geological features such as peaks and ridges of mountain ranges separate pairs both physically and visually and will often determine the shape and size of breeding territories. Eagles may move long distances, between 30 and 80 miles, outside of the breeding season (Data on File. Satellite telemetry database. WRI 2010). Each core nesting area belongs to a separate pair of Golden Eagles and is defended against other eagles and, often, other raptors. This behavior-based core nesting area forms the basis for determining a territory. Core nesting areas separated by several miles are almost always separate pairs and the rough center of a territory. WRI has found separate core nesting areas as close as 2 miles, but generally they are at least 5 miles apart as seen in the Golden Eagle survey WRI conducted in the Anza-Borrego State Park in which all core nesting sites in the study area were 5 miles or more apart from each other (WRI 2009b). Research on Golden Eagles in prime habitat indicates territories are 20 to 25 square miles in size (McGrady et al. 2002; Bittner unpublished data) but most desert-nesting Golden Eagles have much larger territories encompassing 100 to 120 square miles due to the lack of prime foraging areas (Bittner unpublished data).

During this Phase 1 survey, we observed 140 total nests, 34 of which were Golden Eagle nests. Of the 34 Golden Eagle nests, 11 were found to be recently or currently active and one of these (Northeast Coxcomb Mountains) was observed to have an incubating female. These nests accounted for 14 Golden Eagle territories; 9 active and 5 inactive. Every mountain range in the study area, except for the Orocopia and Hodges Mountains, had nest evidence of Golden Eagle breeding attempts in recent years but not all had evidence of 2010 activity. As previously noted, this is not unusual since healthy populations of Golden Eagles may average as few as 62% of pairs breeding in any one year (Kochert et al. 2002).

## PHASE 1 REPORT

Numerous raptors and mammals (i.e., Barn Owl, Bighorn Sheep, Common Ravens, Cooper's Hawk, Great Horned Owls, Grey Fox, Long-eared Owl, Osprey, Prairie Falcons, Red-tailed Hawks, Swainson's Hawk, and Turkey Vultures) were observed, including 5 Golden Eagles and 51 Desert Bighorn Sheep, totaling 338 wildlife documentations.

# PHASE 2 REPORT

## PHASE 2 REPORT

### EXECUTIVE SUMMARY – PHASE 2 SURVEY

This section reports on findings of the **Phase 2** survey conducted in the Eastern Mojave Desert Region, California, to record and report productivity for Golden Eagles within 10 miles of the boundaries of the 4 proposed solar developments in order to comply with the U.S. Fish and Wildlife Service recommendations. The 9 active Golden Eagle territories identified during Phase 1 surveys were revisited by Wildlife Research Institute biologists via helicopter in mid-May, 2010. The 1 occupied territory (Northeast Coxcomb Mountains) identified during Phase 1 surveys was confirmed active and productive during the Phase 2 survey by the observation of 2 Golden Eagle nestlings. No new nest activity was observed at any of the other territories except for the Big Maria Mountains territory where fresh material had been added to the active nest recorded during Phase 1 surveys. In addition to the 2 Golden Eagle nestlings, 3 other species (i.e., Great Horned Owl, Prairie Falcon, and Red-tailed Hawk) were observed during the Phase 2 survey totaling 16 wildlife documentations. All sightings have been documented with GPS locations and recorded on the attached maps and tables as recommended in the USFWS Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance.

## PHASE 2 REPORT

### **METHODS AND CONSTRAINTS**

#### **Methods**

Only territories identified as active during Phase 1 surveys were surveyed again during Phase 2.

All surveying and reporting complies with the current U.S. Fish and Wildlife Service Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance released in 2010 (Pagel et al. 2010).

#### **Survey**

We used a Hughes-500 helicopter that provided seating for three wildlife biologists (including 2 Golden Eagle biologists, one of whom also had extensive Bighorn Sheep experience) and the pilot. Both pilots used by WRI for these surveys have extensive Golden Eagle and Bighorn Sheep experience (Appendix A).

This final Golden Eagle survey was conducted on May 14, 2010, by helicopter and included approximately 13 person-hours of actual aerial observations. The biologists for this survey were Dave Bittner, Chris Meador, and Dr. Renée Rivard; the pilot was Mel Cain. This survey focused only on revisiting active territories that were identified during the previous, Phase 1, survey in an effort to confirm reproductive activity. Inactive territories noted during Phase 1 were not resurveyed during Phase 2.

#### **GPS**

Nest site and other location-specific data were determined and documented during Phase 2 survey using hand-held GPS units (Garmin Map60GSx). A sequential number was assigned to each observation that corresponded to the GPS waypoint. Waypoints were recorded using the UTM grid in the WGS 84 Datum. GPS was also used to track our survey routes. Handwritten notes, on field forms, were taken that documented species, detailed observations, and corresponded to each GPS waypoint.

#### **Photography**

Photographs were taken with Nikon equipment with GPS units attached so that latitude and longitude could be recorded on each digital picture. Two cameras were used; one for recording wide-angle shots (18-200mm optically-stabilized zoom lens) and another for recording close-ups (200-400mm optically-stabilized zoom lens). The 400mm zoom lens plus the ability to enlarge the digital photographs allows accurate and detailed records to be captured with minimal disturbance to wildlife. This is also important because it allows review and confirmation of our observations in an environment that is more stable than the cockpit of a helicopter.

## PHASE 2 REPORT

### Data

We photographed all active Golden Eagle nests, some other raptor nests, representations of numerous inactive Golden Eagle nest sites, and significant other wildlife species observed. The following data were also specifically collected and are on file at WRI but map coordinates for nests of sensitive species (i.e., Golden Eagle, Peregrine Falcon, and Prairie Falcon) may not be included in all reports (Table 1):

- Species
- Number of nests/alternative nests observed
- Condition of each nest and whether or not it was active
- Nest aspect
- Nest elevation
- Nest GPS coordinates
- Nest substrate (cliff, transmission tower, etc.)
- Age class of Golden Eagles and other species if determinable
- Behavior of species observed.

### Constraints

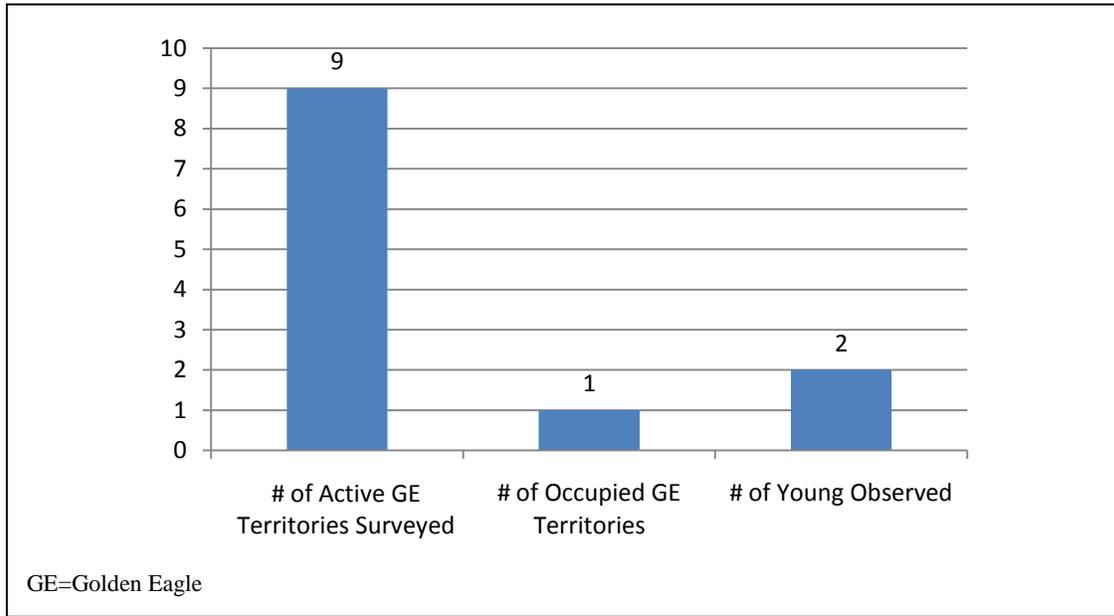
Constraints for Phase 2 were similar to those of Phase 1. In that this was a diurnal survey focused on Golden Eagles, we were less likely to observe nocturnal and crepuscular raptors (i.e., owls) or nocturnal mammals. Aerial surveys also tend to under-represent the smaller species, like the American kestrel (*Falco sparverius*) and burrowing owl (*Athene cunicularia*). No population data can be extrapolated from these surveys except for the focus species, Golden Eagle.

The release of the Interim Golden Eagle Technical Guidance in February and subsequent contracts being finalized in March resulted in Phase 1 survey flights being scheduled late in the Golden Eagle breeding season. Due to the 30-day USFWS recommended wait period between Phase 1 and Phase 2, the latter was conducted very late in the season and therefore some biological windows may have been missed.

## RESULTS

### Golden Eagles

We resurveyed a total of 9 active Golden Eagle territories during this phase of the project, 1 of which (Coxcomb Mountains NE) was occupied and had successfully produced young (Figure 5).



**Figure 5. Phase 2 Golden Eagle Territory Data for Eastern Mojave Desert Region Study Area.**

## PHASE 2 REPORT

Based on recommendations in the USFWS Interim Golden Eagle Guidelines (Pagel et al. 2010), all wildlife observations are documented below in Table 5.

Species	Chuckwalla Mtns	Chuckwalla Valley	Coxcomb Mtns	Eagle Mtns	Palen Mtns	Total
Golden Eagle			2			2
Great Horned Owl	1					1
Prairie Falcon				2	2	4
Red-tailed Hawk		6	1	2		9
<b>Total</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>16</b>

**Table 5. Phase 2 – All Wildlife Observed During Phase 2 Survey.**

Table 6 lists the trip ID, waypoint identification number for each active Golden Eagle nest surveyed, number of eagles observed, the occupancy status of the nest (i.e., if it is occupied or not), the territory name (incorporating the US Geological Survey [USGS] Quad, the USFWS recommended naming convention), the geographic territory name, and the associated Phase 1 waypoint. The occupied territory is highlighted in yellow.

Trip ID	Waypoint	# of Individuals	Occupied	USGS Territory Name	Geographic Area	Phase 1 Waypoint
J	40	0	N	CA-RIV-33114/g6-001-01	Big Maria Mtns	A26
J	53	0	N	CA-RIV-33115/e5-001-01	Chocolate Mtns N	A2
J	52	0	N	CA-RIV-33115/f3-001-03	Chuckwalla Mtns N	B77
J	52	0	N	CA-RIV-33115/f3-001-04	Chuckwalla Mtns N	B77
J	38	0	N	CA-RIV-33115/g1-001-01	Palen Mtns	A47
J	38	0	N	CA-RIV-33115/g1-001-02	Palen Mtns	A47
J	34	0	N	CA-RIV-33115/g3-001-01	Coxcomb Mtns SW	D50
J	-	0	N	CA-RIV-33115/G5-001-02	Eagle Mtns C	B124
J	-	0	N	CA-RIV-33115/h5-001-03	Eagle Mtns N	D35
J	36	0	N	CA-RIV-34115/a4-001-03	Coxcomb Mtns CW	D45
<b>J</b>	<b>37</b>	<b>2</b>	<b>Y</b>	<b>CA-SBD-34115/a3-001-02</b>	<b>Coxcomb Mtns NE</b>	<b>C12</b>

N=No, RIV=Riverside, SBD=San Bernardino, Y=Yes

**Table 6. Phase 2 - Active Golden Eagle Territories with USGS Quad Territory Names.**

PHASE 2 REPORT

**Big Maria Mountains**



**Active Golden Eagle nest (J40GESN-0) in Big Maria Mountains revisited during Phase 2 survey; note presence of fresh material that has been added to the nest.**

PHASE 2 REPORT

**Chocolate Mountains - North**



**Inactive Golden Eagle nest (J53GESN-0) in Chocolate Mountains – North territory.**



**Zoomed-in view of same nest; no new activity observed during the Phase 2 survey.**

PHASE 2 REPORT

**Chuckwalla Mountains - North**



**Zoomed-in view of an inactive Golden Eagle nest (J52GESN-0) in the Chuckwalla Mountains - North territory. No new activity observed since Phase 1 surveys.**

PHASE 2 REPORT

Coxcomb Mountains - Northeast



**Incubating female Golden Eagle observed during Phase 1 surveys in Coxcomb Mountains – Northeast territory.**



**2 Golden Eagle nestlings, approximately 5 weeks old, observed in the same nest (J37GESN-2) during the Phase 2 survey.**

PHASE 2 REPORT

**Coxcomb Mountains – Central West**



**This Golden Eagle nest (J36GESN-0) in the Central West Coxcomb Mountains appears to still be active based on the presence of fresh material in the nest.**

PHASE 2 REPORT

Coxcomb Mountains - Southwest



**Active Golden Eagle nest (J34GESN-0); good condition. No new activity since Phase 1 surveys.**



**View of same nest in the Coxcomb Mountains – Southwest territory.**

PHASE 2 REPORT

**Eagle Mountains - North**



**One of the inactive Golden Eagle nests (J29GESN-0) in the Eagle Mountains – North territory.**



**Another inactive Golden Eagle nest (J30GESN-0) in the Eagle Mountains – North territory. No new activity since Phase 1 surveys.**

## PHASE 2 REPORT

### **Eagle Mountains - Central**

No Golden Eagles or new active nests were found during Phase 2 survey. Only the original activity noted in Phase 1 is recorded.

## PHASE 2 REPORT

### Palen Mountains

No Golden Eagles or new active nests were observed during Phase 2 survey, however a pair of Prairie Falcons were documented to be nesting on the same cliff on which the Golden Eagle nest was located.



**View of 1 of 2 Golden Eagle nests (J38GESN-0) at this waypoint in Palen Mountains territory.**

## PHASE 2 REPORT

### **DISCUSSION OF FINDINGS**

The Phase 2 survey was a much more focused survey in that only territories previously recorded during Phase 1 surveys to be active were revisited. WRI biologists flew directly from one identified GPS waypoint to another. During the Phase 2 survey, we revisited 9 Golden Eagle territories because signs during Phase 1 surveys indicated that breeding activity may be occurring in the territory. While in the area of previously identified active Golden Eagle nest territories, we searched for new nests, signs of eagle perching activity, and signs of young; all of these criteria being a component of our search image. Old, inactive nests were noted only if they were in the immediate area of the active nest. One of the 9 territories resurveyed, Coxcomb Mountains Northeast, actually produced 2 young eagles. None of the other active territories were found to contain young in 2010.

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## **APPENDIX**

### **Appendix A: WRI Golden Eagle Team Biographies**

**Dave Bittner**  
**Executive Director, WRI**  
**Wildlife Biologist/Raptor Ecologist**

Mr. Dave Bittner is a Co-founder and Executive Director of The Wildlife Research Institute, Inc. and has been a Wildlife Biologist for more than 44 years. Much of his work has been with raptors of various species. Dave coordinates an annual Golden Eagle and raptor population study throughout Southern California, including the Western Mojave Desert and the Anza-Borrego Desert State Park. He is the Primary Investigator (P.I.) for the Southern California Golden Eagle Population Study, the longest continuous running (22 years) Golden Eagle study of its kind in the Western Hemisphere, which began in 1968. Currently, he is also the P.I. for WRI's satellite and VHF telemetry-based Golden Eagle migration and habitat use study in cooperation with the US Forest Service, Montana Parks and Wildlife, and the California Department of Fish and Game. WRI, under Dave's direction, has conducted annual helicopter surveys on Golden Eagles and raptors in general since 1996. Dave has banded raptors since 1963 and has banded over 420 Golden Eagles, many with VHF and satellite telemetry. He has conducted Bighorn Sheep surveys, both aerial and ground, for Desert Bighorn Sheep in the Mojave Desert and for Peninsular Bighorn Sheep in the Anza-Borrego Desert State Park and Baja, Mexico since 1998. Dave has also surveyed Bighorn Sheep in Montana where WRI has a research Station. His education includes a B.Sc. in Zoology and Wildlife Management from Ohio State University (1968). He also conducted graduate studies in Avian Reproduction and Natural Resources (1975-1977) at Ohio State University. Dave has worked for the U.S. Fish and Wildlife Service, Cleveland Museum of Natural History, and the Ohio Department of Natural Resources and has taught at three universities.

**Jeffrey L. Lincer, Ph.D.**  
**Research Director, WRI**  
**Senior Scientist/Wildlife Biologist/Raptor Ecologist**

Dr. Lincer is a Co-founder and Research Director of The Wildlife Research Institute, Inc. and has extensive experience surveying for raptors, including helping establish WRI's Montana Raptor Migration Station. He has actively participated in the institute's Southern California Golden Eagle project since 2000, including helicopter surveys since 2001. He has conducted numerous raptor surveys for federal, state, county, and local governments, and the private sector across desert and mountain habitat in the California Mojave and Anza-Borrego deserts, San Diego County, Nevada and the mountains of northern Baja Mexico. In addition, Jeff has over 100 hours of aerial surveying for Bald Eagles and over 50 hours for fish-eating birds. He has conducted Bighorn Sheep surveys, both aerial and ground, in the Mojave Desert and for the Anza-Borrego Desert State Park since 1998. Dr. Lincer's background includes 40 years as a scientist, scientific advisor, and administrator in the environmental research and management areas. He has taught college level courses in environmental and occupational health, environmental science, ornithology, and mangrove ecology, produced over 100 scientific publications and papers (most on raptors), authored dozens of environmental reports,

and served as advisor to high-level governmental offices and national/international conservation programs. Jeff received his Bachelors and Masters degrees in Wildlife Biology/Wildlife Management from Syracuse University and his Doctorate in Ecology and Toxicology from Cornell University. He is most well known for his work with raptors and other threatened/endangered species and his ability to manage complex interdisciplinary projects and work productively with government agencies. He is a Past-President of the Southern Chapter of The Wildlife Society. As President of the Raptor Research Foundation (RRF) from 1982 to 1988, he oversaw the greatest growth of that professional organization in its entire history. He chairs RRF's Leslie Brown Award Grant Committee (for research on African raptors) and chaired the First International Burrowing Owl Symposium and Workshop. He is the Co-editor for the Proceedings of the First International Symposium on Burrowing Owls, a Co-editor of the proceedings of the First California Burrowing Owl Symposium, and is a contributing Technical Editor for a recent book on California's endangered species. Dr. Lincer was the founding Director of the National Wildlife Federation's (NWF) Raptor Information Center. During his NWF tenure, he coordinated with government agencies and the private sector, developed computerized literature databases, and prioritized eagle and other raptor habitat throughout the United States for acquisition. He served as Consulting Editor for the joint RRF/Bureau of Land Management publication, "Raptor Habitat Management Multiple Use Mandate." Over the last four decades, he has worked on major projects from Alaska to Africa, addressing raptor population trends, ecological monitoring, environmental impacts, ecotoxicology, and habitat protection and acquisition.

**Chris Meador**  
**WRI Assistant Director**  
**Wildlife Biologist**

Mr. Meador is a full-time Wildlife Biologist for the Wildlife Research Institute (WRI) and has been a Wildlife Biologist for the past eight years. Chris has three years experience conducting helicopter surveys on Golden Eagles and other raptors, including over 125 hours of helicopter survey experience. He has conducted numerous raptor surveys for federal, state, county and local governments, and the private sector across desert, coastal and mountain habitats. He co-leads WRI's Southern California Golden Eagle Population Study, the longest running study of its kind in the Western Hemisphere and has participated in it for the past ten years. He currently carries out myriad tasks for various projects pertaining to the Golden Eagle. These include trapping, tagging, and affixing radio and satellite telemetry transmitters to nestling, juvenile and adult Golden Eagles in San Diego County as well as migrating Golden Eagles in Montana. He maintains and oversees much of the Wildlife Research Institute's tracking process including gathering, interpreting and publishing data and findings using GPS and GIS integration. Chris has conducted Bighorn Sheep surveys, both aerial and ground, in the Mojave Desert and for the Anza-Borrego Desert State Park since 2008. He has assisted with projects, including research, education and reintroduction on a broad range of species from endangered mammals to sensitive fish and from Burrowing Owls to Desert Tortoises. Mr. Meador also conducts educational programs on multiple topics including natural history, ecology and conservation pertaining to many different species. He is an expert in identification and ecology of North American raptors. He holds a Bachelor of Arts degree with a double major in Environmental Studies and Psychology from Prescott College in Prescott, Arizona.

**Renée Rivard, Pharm.D.**  
**Wildlife Biologist**

Dr. Rivard is currently a member of the Wildlife Research Institute's Golden Eagle team; she has participated in all of WRI's 2010 Golden Eagle surveys conducted for numerous renewable energy projects across desert and mountain habitat in the California Mojave desert, San Diego County, and Nevada. Renée has over 25 hours of experience conducting Golden Eagle helicopter surveys. In addition to participating in aerial transect surveys and ground surveys to identify Golden Eagle nests and territory impacted by renewable energy projects, she has also participated in WRI's ongoing Golden Eagle research and monitoring project in San Diego County as a member of the banding and telemetry teams. She maintains the Golden Eagle Database and helps maintain Burrowing Owl artificial burrows on premises at WRI headquarters and continues to expand her knowledgebase related to these and other raptors. Renée assists with WRI's annual Hawk Watch educational program about the Ramona Grasslands and its raptor residents and migrants. Her 20+ years of database, scientific publishing, and medical research experience provide her with the background and skills to efficiently and professionally assimilate survey data for WRI, clients and agencies. Over the last 4 years, she has accumulated diverse and valuable wildlife knowledge and skills as a wildlife rescuer, rehabilitator, and veterinarian assistant for non-profit organizations in Australia and, more recently, as a field technician and laboratory technician for the San Diego Zoo's Institute for Conservation Research Applied Animal Ecology Department and Wildlife Disease Laboratory, respectively. Renée received her Bachelor's of Science in Biology from the University of South Alabama (1987), graduated *cum laude* with her Doctorate of Pharmacy from Creighton University (1995), and completed specialized post-graduate papers in medical literature evaluation from the University of Auckland in New Zealand (2001).

**Leigh Bittner**  
**Vice-President, WRI**  
**Field Assistant**

Mrs. Bittner first flew Golden Eagle helicopter surveys in 1996. She has participated in Golden Eagle nest surveys, eagle banding, tagging and tracking in California since 1991, New Mexico, 2001 and Montana since 2000. Leigh has also been involved in tagging and releasing of some of the first California Condors in California, 1992, and Arizona, 1996. Leigh is a co-founder of the Wildlife Research Institute, Inc. and has been a Board member since 1996. She is a retired Marketing Manager from Hallmark Corporation and helps coordinate office operations to support WRI's field activities.

**Brittany Schlotfeldt**  
**Wildlife Biologist**

Ms. Schlotfeldt has experience with mammals and birds and field transect experience in both the marine and desert environments. Brittany has one year experience conducting helicopter surveys of Golden Eagles and other raptors. She assisted with the research on coral recruitment across various conditions in Hawaii (Donald Potts Lab, UCSC) and tracked sea otters for SORAC (Sea Otter Research and Conservation) at the Monterey Bay Aquarium. Brittany has also assisted with, and performed, a number of tasks in the upland and desert habitats for various Wildlife Research

Institute (WRI) projects. In the desert environment, she has assisted with WRI's research on golden eagles (radio telemetry and tracking), burrowing owls (transect surveys, field observations, trapping, and banding), and desert tortoises (surveyed over 100 miles of protocol transects in the Western Mojave Desert with Drs. Boarman and Lincer, and Mr. Peter Woodman). This study, which was recently completed, was a follow-up on an earlier project focused on the potential impacts of vehicular traffic, and highway fencing, on tortoise mortality (Boarman and Sazaki 2006). She has additional experience with desert tortoises on Fort Irwin, where she conducted numerous surveys and assisted with the VHF-transmitting of tortoises in an effort to relocate the individuals. Ms. Schlotfeldt received her Bachelor's of Science in Marine Biology from the University of California, Santa Cruz (2008).

**James Hannan, Ph.D.**  
**Senior Wildlife Biologist**

Dr. Hannan has seven years experience with WRI conducting helicopter surveys of Golden Eagles and other raptors. Jim also helps on WRI's long running Golden Eagle Research project with rappelling to, banding and tracking Golden Eagles. He is fluent in Spanish and served as an International Environmental Consultant for the Peace Corps and United Nations Volunteer programs His professional experience includes two years as a Peace Corps Volunteer (fisheries and agriculture, in Panama), one-year Peace Corps staff (fisheries development in Puerto Rico), and one year at the Smithsonian Institution. His academic experience also includes three years as Professor of Marine Biology and Environmental Studies at Florida Institute of Technology. Jim also spent twelve years as a private environmental consultant (contracts included Mexican aquaculture, impacts to Caribbean coral reefs, deer and other game studies involving radio transmitters for the California Dept of Fish and Game). He also served as a Texas game ranch manager, naturalist for East Africa wildlife filming company, fishery management advisor for the Florida Keys and holds a NAUI diver certificate and Florida EMT certificate. Dr. Hannan, is a WRI Senior Wildlife Biologist and Professor, Mesa College. He received his BS in 1965 from Humboldt State University, his MS in 1969 from University of Oregon, and his PhD in 1973 from the University of Miami (FL).

**Jeff Wells**  
**Wildlife Biologist**

Mr. Wells has been involved with WRI's Golden Eagle research since 1991 including trapping, banding and tracking. Jeff has ten years experience with WRI conducting helicopter surveys of Golden Eagles and other raptors. He has his Bachelors in Wildlife Studies from San Diego State University and has over 20 years experience as a private wildlife biologist. For the past 5 years, Jeff has been a Wildlife Biologist for the US Forest Service.

**James Newland**  
**Field Biologist**

Mr. Newland has assisted WRI on Golden Eagle research for the last 4 years banding, trapping, and VHF and satellite tracking. James has also assisted trapping and tracking Golden Eagles at

WRI's migratory research center in Montana. He has one year experience conducting helicopter surveys of Golden Eagles and other raptors. James has a Bachelor's of Science in Electrical Engineering and has worked for numerous large communication corporations.

### **Jeff Laws**

#### **Field Biologist/Bio-climber**

Mr. Laws has assisted WRI with Golden Eagle research and field work since 1995. He has also assisted trapping and tracking Golden Eagles at WRI's migratory research center in Montana. Jeff has five years experience conducting helicopter surveys of Golden Eagles and other raptors with WRI. Jeff works as a climber and field installer for San Diego Gas & Electric Company.

### **Mel Cain**

#### **Utility Helicopters**

Mr. Cain has more than 55 years experience flying helicopters for wildlife surveys. Utility Helicopters, with their Hughes-500 helicopters, has assisted WRI in Golden Eagle and raptor surveys for the last 10 years in the United States and Mexico. Mel has 12 years of experience in New Zealand trapping and transporting big game including deer and elk. He has conducted hundreds of netting and translocations of Bighorn Sheep and Tule Elk in California for California Fish and Game and California State Parks. Mel works frequently in Mexico and Canada and maintains NAFTA and Mexican permits to conduct wildlife and resource surveys.

### **Gregg Matson, M.D.**

#### **Cherry Helicopter**

Dr. Matson is a practicing physician who also started and headed a helicopter company in Hawaii to provide industrial and tourist services. Cherry Helicopter uses Hughes-500 helicopters to conduct these surveys. Gregg, WRI, and Cherry Helicopter have conducted wildlife surveys both in the United States and Mexico. He has supported WRI in aerial helicopter surveys of Golden Eagles, raptors and other wildlife for the last 8 years.

### **Barry Martin**

#### **Western Tracking Institute**

Mr. Martin is a WRI Research Associate and Director of the Western Tracking Institute. He has a Bachelor's in Business from Fresno State and an Associate's degree in Aeronautics. He has 42 years of flying experience and 22 years in the Navy with over 300 aircraft carrier landings. Concurrent with his Navy experience, he flew for over 21 years as a pilot for American Airlines. In total, Barry has over 20,000 hours of experience in the air. In 1989, Barry started the San Diego Tracking Team and started the Western Tracking Institute in 2007 to further expand his studies in wildlife populations and movements. In 2006, he started VHF tracking from aircraft primarily for mountain lions and 2 years later, began assisting WRI in aerial VHF tracking of Golden Eagles.