APPENDIX K

GOLDEN EAGLE SURVEY REPORT

(Report for 2013)

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FINAL REPORT

GOLDEN EAGLE (*AQUILA CHRYSAETOS*) SURVEY REPORT FOR THE WEST OF DEVERS UPGRADE PROJECT IN RIVERSIDE AND SAN BERNARDINO COUNTIES, CALIFORNIA

for

Southern California Edison Company
1218 South 5th Avenue
Monrovia, CA 91016

by

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

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Cover Photo//Adult golden eagle (J9) observed 6.5 nautical miles from the project alignment in Whitewater Canyon on May 10, 2013.

ACKNOWLEDGMENTS

Project Manager: Chris Meador
Senior Wildlife Biologists: Dave Bittner, Chris Meador
Wildlife Biologists: Marcus Collado
Data Compilation: Marcus Collado, Katie Quint
Editors: Marcus Collado, Katie Quint, Renée Rivard, PharmD
Photography: Dave Bittner, Chris Meador

SUMMARY

This report provides the findings of the Phase 1 nest occupancy and Phase 2 productivity aerial surveys for golden eagles (*Aquila chrysaetos*) conducted for the West of Devers (WOD) Upgrade Project in Riverside and San Bernardino Counties, California, in order to comply with the U.S. Fish and Wildlife Service (USFWS) survey recommendations (Pagel *et al.* 2010). The primary part of the survey area included approximately 2,000 square kilometers encompassed by the golden eagle spatial buffer that extended 4 nautical miles from the linear project alignment. Additionally, Wildlife Research Institute (WRI) surveyed any nearby nesting habitat outside the spatial buffer that was suitable golden eagle habitat or was a known golden eagle territory based on previous WRI research. WRI recorded 14 golden eagle nests that comprised 7 territories; 1 nest in 1 territory (Soboba Hills N) within the 4-nautical-mile golden eagle spatial buffer was active and produced 2 chicks. Of the remaining 6 territories outside of the 4-nautical-mile golden eagle spatial buffer, 2 were active and produced a total of 3 chicks (Soboba Hills E, Whitewater Canyon), 2 were active but not productive (Coal Canyon, Little San Bernardino Mountains) and 2 were found to be not active (Allen Peak, San Jacinto Mountains).

During the surveys, a total of 12 golden eagles (adults, chicks and/or eggs) and 12 other wildlife species (ie, American kestrel [*Falco sparverius*], barn owl [*Tyto alba*], Cooper's hawk [*Accipter cooperii*], common raven [*Corvus corax*], great horned owl [*Bubo virginianus*], mule deer [*Odocoileus hemionus*], northern harrier [*Circus cyaneus*], peregrine falcon [*Falco peregrinus*], prairie falcon [*Falco mexicanus*], red-tailed hawk [*Buteo jamaicensis*], Swainson's hawk [*Buteo swainsoni*] and turkey vulture [*Cathartes aura*]) were observed totaling 316 wildlife documentations. All sightings have been documented with GPS locations and recorded 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 (Pagel *et al*. 2010) and the subsequent Draft Eagle Conservation Plan Guidance (Gould and Schmidt 2011).

INTRODUCTION

Golden eagles respond to environmental changes in order to survive and reproduction in golden eagles, as in many predators, can be 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). Jackrabbits, 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 averaging 50% 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).

Golden 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 begins with courtship December to January, nest building and egg laying January to March and hatching and raising the young eagles 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. This huge investment of time and energy on the part of the adults, just to raise one or two young, may contribute to some pairs taking a year off from breeding occasionally even when food is abundant. After leaving the nest, young eagles will explore their natal area and may continue to hunt close by or may venture tens to hundreds of miles away; occasionally returning briefly to their natal area (Bittner unpub. data).

WRI has learned, based on 25 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 primarily conducted to determine reproductive success but can also identify successful nesting attempts that were missed during initial surveys as well as reveal fledging success. Additionally, WRI has found helicopter surveys to be the least disruptive, most efficient and most accurate method for determining occupancy and productivity for cliff-dwelling raptors, especially when coupled with the use of high-quality digital photographic equipment. Evidence supports our observation that helicopters cause little to no disturbance to golden eagles even when nesting (McIntyre 2006, Grubb *et al*. 2010, McIntyre and Schmidt 2012, Bittner unpub. data), in contrast to evidence regarding ground activity (Scott 1985, Holmes 1993, Steidl 1993, Kaisanlahti 2008, Klute 2008).

GLOSSARY

Nest Terminology

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", which is an indication of territory occupancy.

Photo 1. Example of a nest in good condition decorated with fresh sticks

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.

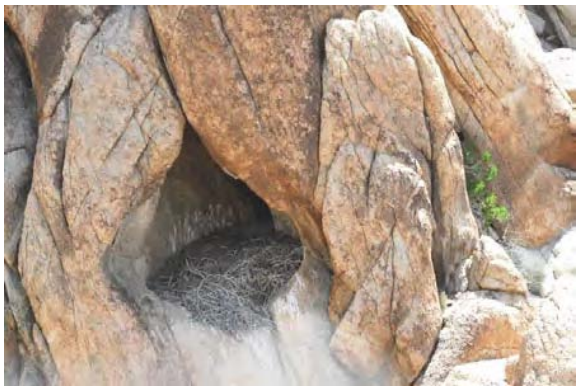


Photo 2. Example of a nest in fair condition

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.

Photo 3. Example of a nest in poor condition

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.

Nest Activity

The activity status of a golden eagle nest is an important indicator of how recently the nest has been used and, in the absence of observing an eagle on territory, can provide evidence that a pair of eagles is occupying a territory and preparing for egg laying.

Photo 4. Example of an active nest with new material in bowl

Photo 5. Example of an occupied nest with an incubating female golden eagle

Photo 6. Example of an inactive nest that is beginning to deteriorate

Active nest (occupancy implied) - An **active golden eagle nest** is a nest in good condition that has been decorated (new material added to the nest) during the current breeding season. It will usually include the use of yucca, new sticks, fresh greenery and the construction of a bowl, which is created in preparation for egg-laying and incubation. An active nest may not necessarily be **occupied** but does constitute evidence of, and thereby implies, territory occupancy.

Occupied nest (occupancy confirmed) – An **occupied golden eagle nest** is an active nest used for breeding in the current year by a pair in which an adult or young golden eagle, or a new egg, has been observed. A nest is considered by the USFWS to be "occupied" throughout the periods of egg laying, incubation, brooding, fledging, and post-fledging dependency of the young.

Once a nest is chosen for incubation, other nests previously observed in the territory to be active no longer need to be monitored.

Inactive nest - An **inactive golden eagle nest** is a nest that is not currently being used by eagles as determined by the continued absence of any nest decoration, adult, egg, or dependent young during the current breeding season. An inactive nest may become active again in subsequent breeding seasons and remains protected under the Eagle Act.

Nest Arrangement

A golden eagle pair may often construct several nests in close proximity to one another. Often times, these nests are within a few feet of each other and may lie in a vertical or horizontal arrangement.

Photo 7. Example of multiple (2) nests in close proximity marked by a single waypoint

Marking multiple nests at one waypoint – During surveys, multiple nests in close proximity to one another are often recorded at a single waypoint for graphic clarity and readability.

WRI uses the following format for denoting multiple nests, for example 2, at one waypoint: A101a, A101b where "A" is the trip ID, "101" is the waypoint and two different nests, "a" and "b," are documented individually.

Territory Terminology

An eagle territory is defined in 50 CFR 22.3 as an area that contains, or historically contained, one or more nests within the home range of a mated pair of eagles. Newton considered the nesting territory of a raptor as the defended area around a pair's nest site and defined the home range as "...the area traveled by the individual in its normal activities of food gathering, mating, and caring for the young" (Gould and Schmidt 2011). According to the USFWS, all nest sites within a breeding territory are deemed occupied while raptors are demonstrating pair bonding activities and developing affinity to a given area (Pagel *et al*. 2010).

Active/Occupied Territory

A golden eagle territory may be determined to be "active" (or more specifically "occupied") for the current breeding season if either of the following observations is made: (1) one or both of a golden eagle pair is observed demonstrating pair bonding activity, such as nest building or courtship behavior (active with confirmed occupancy) or (2) if *evidence* of pair bonding activities is observed, such as observing a decorated nest, (active with implied occupancy).

Inactive Territory

A golden eagle territory is determined to be inactive if occupancy or breeding cannot be confirmed. This occurs if no golden eagle pair bonding or evidence of pair bonding is observed for the current breeding season during the surveys. Golden eagles sometimes take a year or two off from breeding and may still be living in the territory even in the absence of breeding. Inactive territories may become active again.

SURVEY AREA

The WOD Upgrade Project area, including the 4-nautical-mile golden eagle spatial buffer, covers approximately 2,000 square kilometers. WRI surveyed suitable golden eagle habitat within the 4-nautical-mile buffer and any previously documented golden eagle nests in surrounding areas.

The survey area included parts of the Soboba Hills, San Jacinto Mountains, San Bernardino Mountains, and the Badlands of Moreno Valley. Habitat types ranged from agricultural lands in the valleys to high subalpine rocky canyons. Vegetation types consisted mostly of creosote bush scrub, oak woodlands, pinyon pine, California juniper and stands of large conifers.

Figure 1. Vicinity Map of Survey Area.

PROPOSED PROJECT

The following description of the West of Devers Upgrade Project (Proposed Project) was prepared by and for Southern California Edison:

The Proposed Project is located primarily within the existing WOD corridor in the incorporated and unincorporated areas of Riverside and San Bernardino Counties including the Reservation, and the Cities of Banning, Beaumont, Calimesa, Colton, Grand Terrace, Loma Linda, and Redlands.

The Proposed Project would upgrade the existing WOD system by replacing existing 220 kilovolt (kV) transmission lines and associated structures with new, higher-capacity 220 kV transmission lines and structures; modifying existing substation facilities; removing and relocating existing subtransmission (66 kV) lines; removing and relocating existing distribution (12 kV) lines; and making various telecommunication improvements. In particular, the Proposed Project would:

- Upgrade substation equipment within SCE's existing Devers, El Casco, Etiwanda, San Bernardino, and Vista Substations in order to accommodate continuous and emergency power on the upgraded WOD 220 kV transmission lines. Upgrade SCE's existing Timoteo and Tennessee Substations in order to accommodate the 66 kV subtransmission line relocations.
- Remove and upgrade the existing 220 kV transmission lines and structures primarily within the existing WOD corridor as follows:
    - Segment 1 would be approximately 3.5 miles in length and extend south from San Bernardino Substation to the San Bernardino Junction and include the following existing 220 kV transmission lines: Devers-San Bernardino, Etiwanda-San Bernardino, San Bernardino-Vista, and El Casco-San Bernardino.
    - Segment 2 would be approximately 5 miles in length and extend west from the San Bernardino Junction to Vista Substation and include the following existing 220 kV transmission lines: Devers-Vista No. 1 and Devers-Vista No. 2.
    - Segment 3would be approximately 10 miles in length and extend east from the San Bernardino Junction to El Casco Substation and include the following existing 220 kV transmission lines: Devers-Vista No. 1, Devers-Vista No. 2, El Casco-San Bernardino, and Devers-San Bernardino.
    - Segment 4 would be approximately 12 miles in length and extend east from the El Casco Substation to San Gorgonio Avenue in the City of Banning and include the following existing 220 kV transmission lines: Devers-Vista No. 1, Devers-Vista No. 2, Devers-El Casco, and Devers-San Bernardino.
    - Segment 5 would be approximately 9 miles in length and extend east from San Gorgonio Avenue in the City of Banning to the eastern limit of the Morongo Indian Reservation[1] at Rushmore Avenue and include the following existing 220 kV transmission lines: Devers-Vista No. 1, Devers-Vista No. 2, Devers-El Casco, and Devers-San Bernardino.

[1] Approximately 3 miles of existing ROW would be abandoned and replaced with a new 3-mile alignment pursuant to the SCE-Morongo ROW agreement. In addition, this segment consists of an alternative to a new 3-mile alignment (220 kV Transmission Line Route Alternative 1) which is further explained in Section 3.14 Project Alternatives.

  - Segment 6 would be approximately 8 miles in length and extend east from the eastern limit of the Morongo Indian Reservation to Devers Substation and include the following existing 220 kV transmission lines: Devers-Vista No. 1, Devers-Vista No. 2, Devers-El Casco, and Devers-San Bernardino.
- Remove a portion (approximately 2 miles) of the existing San Bernardino-Redlands-Timoteo and San Bernardino-Redlands-Tennessee 66 kV subtransmission lines from within the existing WOD right-of-way (ROW) and reconstruct as follows:
  - The relocated San Bernardino-Redlands-Timoteo 66 kV Subtransmission Line would be approximately 2 miles in length and would reconnect to the San Bernardino-Redlands-Timoteo 66 kV Subtransmission Line inside Timoteo Substation.
  - The relocated San Bernardino-Redlands-Tennessee 66 kV Subtransmission Line would be approximately 3.5 miles in length and would reconnect to the San Bernardino-Redlands-Tennessee 66 kV Subtransmission Line at Barton Road.
- Remove a portion of the existing Dental and Intern 12 kV distribution circuits within the WOD ROW and relocate the circuits as follows:
  - The relocated Dental 12 kV Distribution Circuit would be approximately 1.5 miles in length and would re-connect to the existing Dental 12 kV circuit.
  - The relocated Intern 12 kV Distribution Circuit would be approximately 2.25 miles in length and would re-connect to the Intern 12 kV circuit.
- Install telecommunication lines and equipment for the protection, monitoring, and control of transmission lines and substation equipment.

METHODS AND CONSTRAINTS

Methods

WRI conducted aerial surveys surrounding the proposed project area including an approximate 4-nautical-mile spatial buffer measured from the project alignment. Details regarding weather conditions and other information for each survey were recorded (Table 1), golden eagle nests and their associated territories were documented (Table 2), all significant other wildlife observed were noted (Table 3) and descriptive data for each observation were recorded on the transect data sheet (Table 4). The activity status of all golden eagle nests were either defined during the survey, if possible, and/or confirmed later upon review of photographs. Even in the absence of incubating females, observations of nest decoration such as fresh yucca or leafy green branches, as well as new nest sticks built into and above old nest material helped to assess activity at the nest site during the 2013 breeding season.

We utilized WRI's 2011 survey data and 2011 Devers Palo Verde Final Report (Bittner *et al.*2011) directly pertaining to the project area to improve our survey focus, specifically by revisiting previously documented nest locations.

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) and the subsequent Draft Eagle Conservation Plan Guidance (Gould and Schmidt 2011).

Surveys

Aerial surveys concentrated on any area with suitable golden eagle nesting habitat with possible nesting substrate that included cliffs with geological features such as flat ledges or shallow cavities/caves that could allow for safe nest construction, and were high enough to provide protection from ground-dwelling predators. These surveys included all or part of every mountain range in the study area. We also surveyed large transmission towers in certain areas in the project area because golden eagles are known to nest on these types of structures. Scheduling of Phase 1 golden eagle occupancy surveys was purposefully intended to coincide with late courtship and/or egg-laying through hatch as recommended in Pagel *et al.* 2010. Phase 1 surveys were extensive, having the goal of discovering as many eagles as possible. Phase 2 surveys were short and focused on returning to only those eagle nests that were seen to be active during Phase 1 surveys.

Known golden eagle nests, based on WRI's long-term survey history, outside of the study area were documented in order to create a biologically robust dataset. Golden eagle territories encompass an extensive amount of land, about 19 to 59 square miles in size (Dixon 1937). These large territories include a core nesting area and bordering foraging areas that may overlap the study area. Although the nests may reside outside the study area but still within relatively close proximity, occupying adults could potentially be spending time foraging and/or exhibiting breeding behaviors, including courtship, within the study area during the breeding season. Additionally, if necessary, nests outside the study area may be surveyed before entering the study area in order to familiarize the pilot with WRI survey protocols while also allowing WRI to adjust to the pilot and/or helicopter.

Phase 1 Surveys (Occupancy) - Aerial Surveys 27 – 29 March, 2013
On March 27, 2013, WRI began Phase 1 surveys around the WOD Alignment to search for and document all raptors, focusing on golden eagles. For the first day on March 27, 2013, we used a Hughes-500 helicopter, and for the 28th and 29th we flew in the larger Eurocopter AS350 'A-Star", both of which are owned and operated by Southern California Edison. Both models of helicopter provided seating for three wildlife biologists (including at least 2 golden eagle biologists) and the pilot. Observer 1 (front right seat) was a golden eagle biologist who served as the primary observer for the right side of the helicopter as well as the navigator for the survey, observer 2 (back left seat) was a golden eagle biologist who served as the primary observer for the left side of the helicopter and observer 3 (back right seat) was the primary note taker and secondary observer for the right side of the helicopter (Table 1). The pilot used by WRI for these surveys was under the employ of Southern California Edison and may or may not have extensive experience conducting wildlife surveys.

Phase 2 Surveys (Productivity) – Aerial Surveys 10 May 2013
On May 10, 2013 WRI conducted Phase 2 surveys around the WOD Alignment, focusing on only the golden eagle nests that were found during Phase 1 surveys. The purpose of this flight was to record any reproduction efforts made by the eagles and count any possible chicks. During this day of surveys we used the Eurocopter AS350 "A-Star" owned and operated by Southern California Edison, and WRI observer arrangement was identical to Phase 1 surveys (Table 1).

GPS
Nest site and other location-specific data were determined and documented using hand-held GPS units (Garmin Map60GSx; accuracy less than 10 meters, 95% typical). A sequential number was assigned to each observation that corresponded to the GPS waypoint. Waypoints were recorded using the UTM grid in the NAD 83 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 (Table 4).

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. Cameras used included a D-800 unit with a 36 mega pixel chip and a D-3000 with a 13.5 mega pixel. This resolution quality 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 (ie, 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 and 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 in particular, as well as other raptors such as prairie falcons, 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 (eg, hawk or falcon), however the original nest builder (eg, golden eagle) was recorded in the Notes section of the transect data sheet (Table 4). These old golden eagle nests, when viewed along with more current nests, often help define the history and core nesting area/territory of a particular pair of eagles. The core nesting area is the spatial area that contains the nests used by a breeding pair of eagles over time and is comprised of several nests; the size of this area is variable and depends on many factors including topography, prey availability, adjacent territories of golden eagles and other raptors, etc.

Constraints

Strong winds were encountered in some areas during Phase 2 surveys, such as canyons in the Little San Bernardino Mountains that made it difficult to document certain details and/or photograph each of the golden eagle nests.

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

RESULTS

Maps of Golden Eagles and Other Sensitive Species and Their Nests

WRI documented a total of 12 golden eagles (ie, adults, eggs, chicks) and 14 golden eagle nests; 1 of which was observed within the WOD Upgrade Project spatial buffer, 13 of which were observed in the surrounding area. Phase 2 surveys focused on revisiting golden eagle nests that had been documented as active during Phase 1. Figure 2 and Figure 3 on the following pages show the approximate location of golden eagles and other sensitive species (ie, peregrine falcon and prairie falcon) observations documented in and around the WOD Upgrade Project area during Phase 1 and Phase 2 surveys, respectively.

Figure 2. Phase 1 Golden Eagle and Other Sensitive Species Observations for the WOD Upgrade Project 2013.

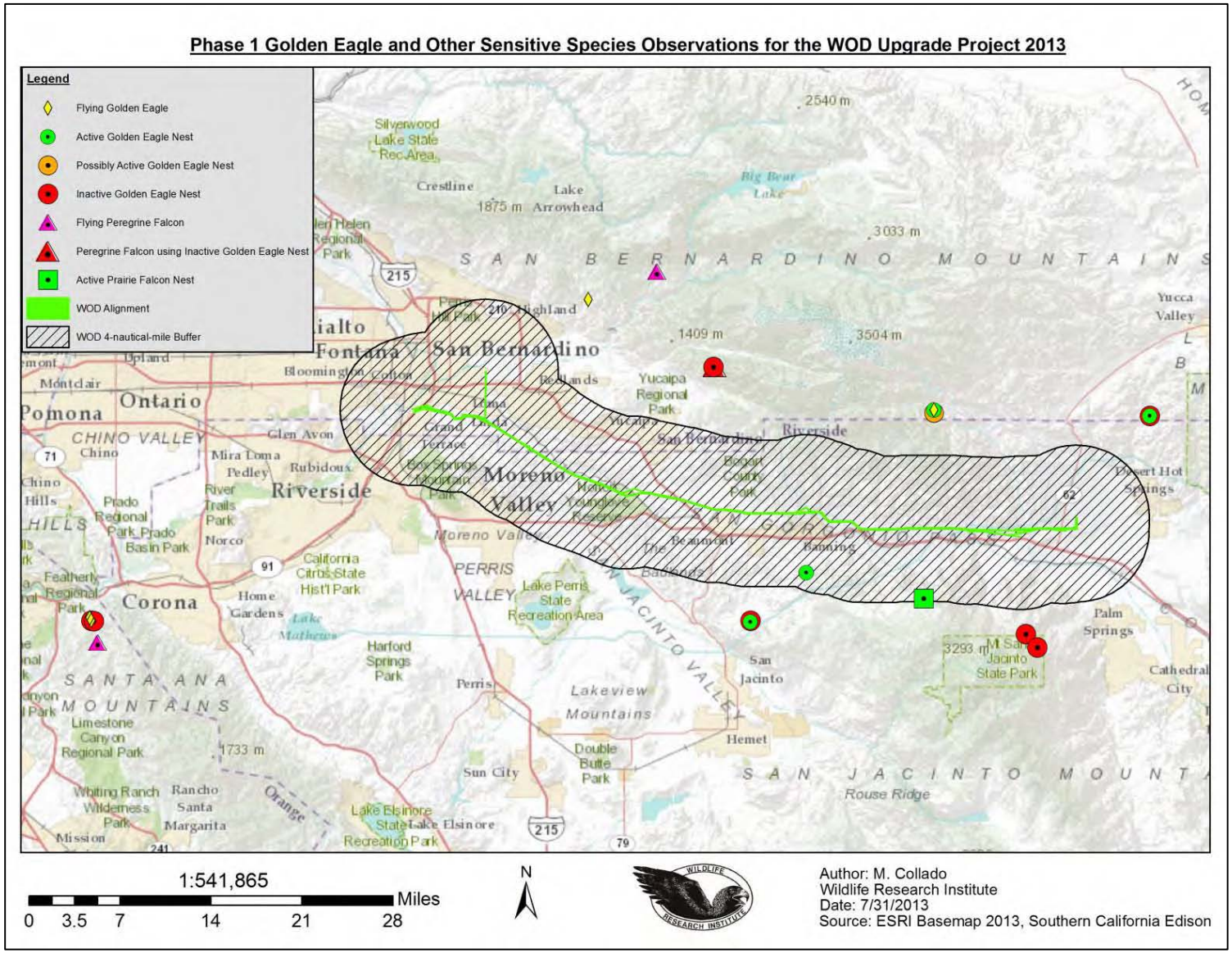
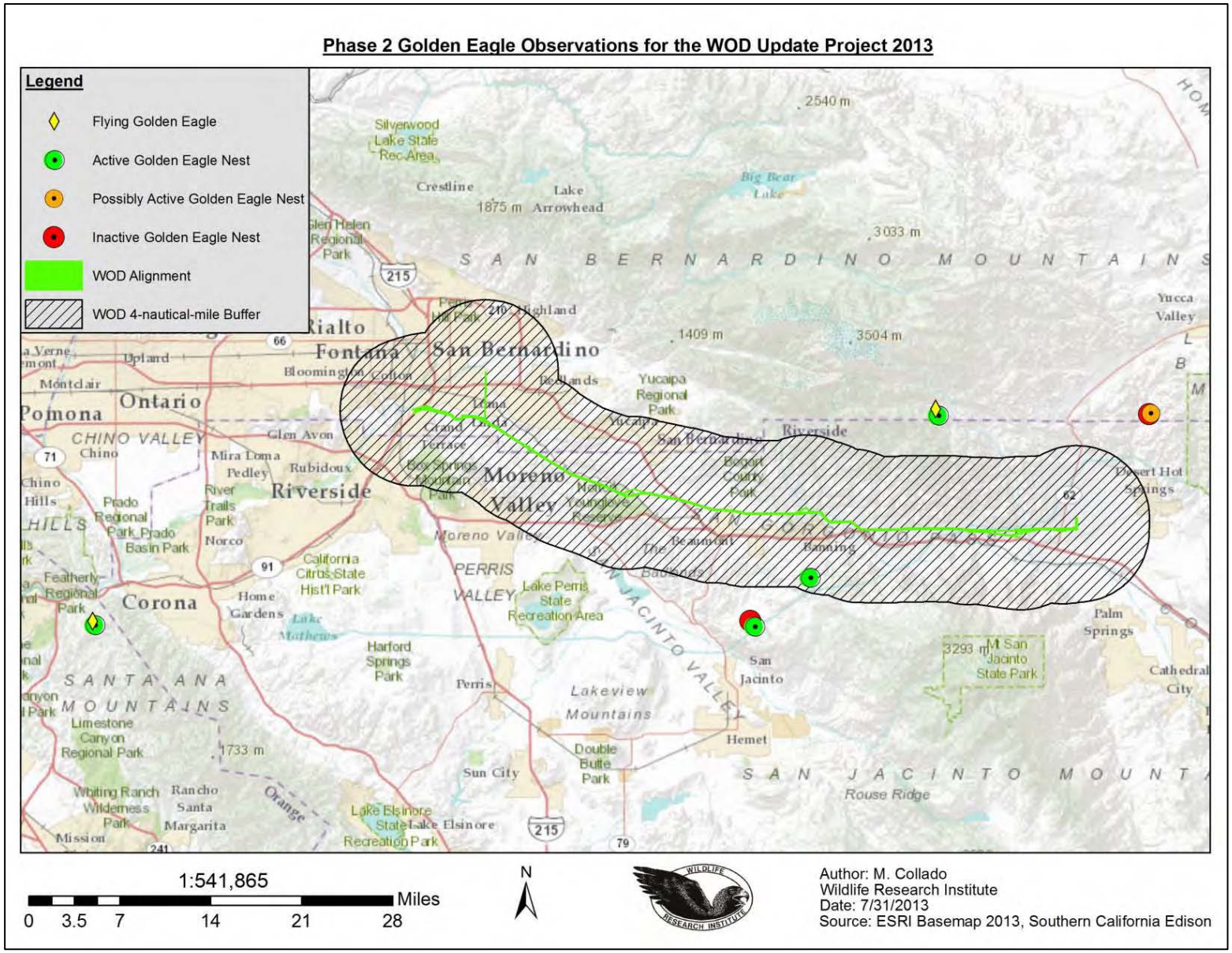


Figure 3. Phase 2 Golden Eagle Observations for the WOD Upgrade Project 2013.



Flight and Weather Details

Details regarding the weather and observers for each flight are provided in the table below.

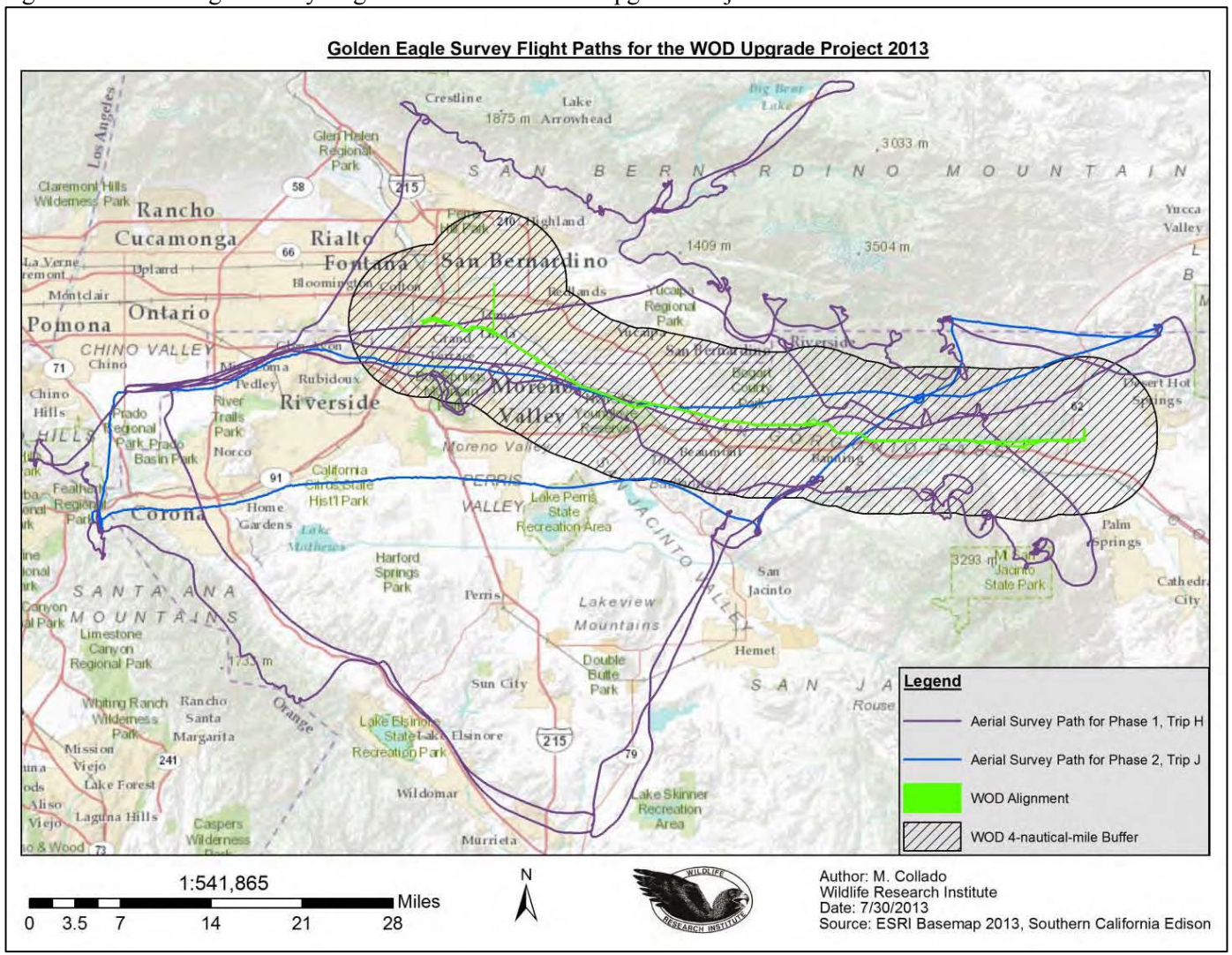
Table 1. Flight and Weather Details for Phase 1 and 2 Aerial Surveys for the WOD Upgrade Project.

Date	General Area of Flight Transect	Trip ID	Flight Number	Observer 1	Observer 2	Observer 3	Pilot	Start Time	End Time	Start Temperature	End Temperature	Start Cloud Cover	End Cloud Cover	Start Wind Speed	End Wind Speed	Start Visibility	End Visibility	Start Precipitation	End Precipitation
3/27/2013	San Jacinto Mountains	H	1	D.Bittner	C.Meador	M.Collado	A. Hogan	11:38	12:46	20	22	70	70	2	2	11-15	11-15	0	0
3/27/2013	Chino Hills	H	2	D.Bittner	C.Meador	M.Collado	A. Hogan	14:29	16:12	77	70	20	25	2	3	16+	16+	0	0
3/28/2013	San Bernardino Mountains	H	3	D.Bittner	C.Meador	M.Collado	A. Hogan	10:15	11:45	71	60	90	80	2	2	6-10	11-15	0	0
3/28/2013	San Bernardino Mountains	H	4	D.Bittner	C.Meador	M.Collado	A. Hogan	13:00	15:25	54	76	40	10 10	4	3	16+	16+	0	0
3/29/2013	The Badlands	H	5	D.Bittner	C.Meador	M.Collado	A. Hogan	10:42	13:17	64	73	0	20	1	3	16+	11-15	0	0
5/10/2013	San Bernardino Mountains, San Jacinto Mountains (Soboba)	J	1	D.Bittner	C.Meador	M.Collado	M. Fournier	10:48	12:30	24	27	15	5	2	2	11-15	11-15	0	0

Flight Paths

Flight paths of the Phase 1 and 2 aerial surveys surrounding the project area are provided in the map below; the project area including the golden eagle spatial buffer are also depicted.

Figure 4. Golden Eagle Survey Flight Paths for the WOD Upgrade Project 2013.



Golden Eagle Nests and Associated Territories: USGS Quad Designation

The table below lists the geographical area where the nest was located or territory name established by WRI, trip identifier (a unique alpha character applied to each WRI survey conducted during 2013) and waypoint identification number for each golden eagle nest observed, the nest builder and occupant (if different than the builder), the GOEA activity status of the nest (ie, active or not during 2013 breeding season), the USGS Quad unique nest identifier (incorporating the state, county, and US Geological Survey [USGS] Quad with territory and nest number; which is the USFWS recommended naming convention), the number of young produced and the 2011 trip identifier and waypoint number if revisited in 2013. Active nests, and thereby territories, documented are denoted with green.

Table 2. Golden Eagle Nests and Associated Territories.

Geographic Area / Territory	Trip ID and Waypoint		Nest Builder (Occupant)	2013 GOEA Activity	GOEA Nest USGS Quad Unique Identifier	# of Young Produced	2011 Trip ID and Waypoint
	Phase 1	Phase 2					
Soboba Hills - East	H7	J5	-	Y	CA-RIV-33116/G8-002-01	1	Y261
Soboba Hills - East	H8	J6	-	N	CA-RIV-33116/G8-002-02	0	Y262
Soboba Hills - North	H9	J8	-	Y	CA-RIV-33116/H8-001-02	2	-
Coal Canyon	H35	J2	-	Y	CA-RIV-33117/G6-001-01	0	-
Coal Canyon	H38	-	-	N	CA-RIV-33117/G6-001-02	0	-
Allen Peak	H80a	-	GOEA (PEFA)	N	CA-SBD-34116/A8-001-02	0	K127b
Allen Peak	H80b	-	-	N	CA-SBD-34116/A8-001-01	0	K127a
Whitewater Canyon	H86a	J10	-	Y	CA-RIV-34116/A6-001-01	2	-
Whitewater Canyon	H86c	-	-	P	CA-RIV-34116/A6-001-02	0	-
Little San Bernardino Mountains	H87	J11	-	N	CA-SBD-34116/A4-001-02	0	Y307
Little San Bernardino Mountains	H88	J12	-	Y	CA-SBD-34116/A4-001-01	0	Y306
San Jacinto Mountains	H124	-	-	N	CA-RIV-33116/G6-001-01	0	Y243
San Jacinto Mountains	H125	-	-	N	CA-RIV-33116/G6-001-02*	0	Y244
San Jacinto Mountains	H127	-	GOEA (RTHA)	N	CA-RIV-33116/G6-001-03*	0	-

CA=California, GOEA=Golden eagle, N=No, P=Possibly, RIV=Riverside County, SBD=San Bernardino County, Y=Yes

* Based on the USFWS recommended naming convention, the USGS Quad unique identifier is based on the location of the first nest observed for a given territory. Territories denoted with an asterisk in this table were physically located in a different USGS Quad than the first observed nest but retain the Quad identifier of the first nest.

General Wildlife Observations

The following table lists the number of each species observed during Phase 1 and 2 surveys. The significant difference in quantities documented between Phase 1 and 2 is a result of Phase 2 surveys being almost exclusively focused on revisiting golden eagle nests that were observed to be active during Phase 1 surveys. A total of 316 observations were documented.

Table 3. All Wildlife Observed During Phase 1 and 2 Aerial Surveys.

Species	Phase 1	Phase 2	Total
American Kestrel	7		7
Barn Owl	1		1
Common Raven	132		132
Cooper's Hawk	3		3
Golden Eagle	**9**	**8**	**17***
Great Horned Owl	2		2
Mule Deer	3	3	6
Northern Harrier	1		1
Peregrine Falcon	5		5
Prairie Falcon	2		2
Red-tailed Hawk	57	1	58
Swainson's Hawk	71		71
Turkey Vulture	11		11
Total	**304**	**12**	**316**

*Of the 17 total observations, 5 were made of the same golden eagles (ie, adults, eggs, chicks) in both Phase 1 and Phase 2 resulting in an overall total of 12 unique individual golden eagle documentations.

All Data from Phase 1 and 2 Surveys

The table below provides a comprehensive list of all observations documented during the Phase 1 and 2 golden eagle aerial surveys completed for the WOD Upgrade Project in Riverside and San Bernardino Counties, CA. Golden eagle data is denoted in bold text. UTM coordinates that may reference any golden eagle nests have been omitted to protect nest location and limit disturbance. These can be obtained directly from WRI upon request by responsible parties.

Table 4. All Data for Phase 1 and 2 Aerial Surveys.

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
Soboba Hills	H	1	CORA	500960	3745563	U	U	FL	4					
Soboba Hills	H	2	CORA	502120	3747049	U	AHY	IN	1	G	W	R	Y	
Soboba Hills	H	3	CORA	500879	3745646	U	U	FL	4					4 hikers, stream and canyon
Soboba Hills	H	4	RTHA	502823	3743691	U	ASY	FL	1					
Soboba Hills	H	5	RTHA	503050	3743784	U	U	FL	2					
Soboba Hills E	H	6	CORA	504486	3744772	U	U	FL	20					20+
Soboba Hills E	**H**	**7**	**GOEA**			**U**	**ATY**	**IN**	**1**	**G**	**W**	**R**	**Y**	**(Y261 from 2011)**
Soboba Hills E	**H**	**8**	**GOEA**							**P**	**W**	**R**	**N**	**(likely Y262 from 2011)**
Soboba Hills N	**H**	**9**	**GOEA**			**U**	**ATY**	**IN**	**1**	**G**	**NW**	**R**	**Y**	**newly found GOEA nest this year, prey items in nest**
Soboba Hills	H	11	CORA	502540	3745015	U	U	FL	15					15+ individuals
Soboba Hills	H	12	RTHA	501035	3742332	U	ASY	FL	1					stooping
Chino Canyon	H	13	RTHA	432705	3752410	U	ASY	FL	1					
Chino Canyon	H	14	MD	430751	3752474	U	U		1					
Chino Canyon	H	15	RTHA	430802	3752735	U	ASY	IN/FL	4	G	S	R	Y	15a: 1 adult plus 3 eggs
Chino Canyon	H	15	RTHA	430802	3752735					F	S	R	N	15b
Chino Canyon	H	16	RTHA	430334	3752916	U	ASY	FL/PE	1					
Chino Canyon	H	17	RTHA	430510	3753207	U	ASY	FL	1					

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
Chino Canyon	H	18	RTHA	430656	3753926	U	ASY	FL	1					
Chino Canyon	H	19	MD	430674	3754050				1					
Chino Canyon	H	20	GHOW	430843	3754529	U	U	FL	1					
Chino Canyon	H	21	NOHA	430864	3754623	F	ASY	FL	1					
Chino Canyon	H	22	AMKE	431184	3755019	M	AHY	FL	1					
Chino Canyon	H	23	RTHA	431228	3754921	U	U	FL	1					
Chino Canyon	H	24	TUVU	435324	3751925	U	U	FL	2					
Chino Canyon	H	25	CORA	435840	3752485	U	U	FL	1					
Chino Canyon	H	26	RTHA	435894	3752486	U	U	FL	1					
Chino Canyon	H	27	RTHA	435961	3752465	U	ASY/SY	FL/PE	2					
Chino Canyon	H	28	TUVU	435777	3752230	U	U	FL	2					
Chino Canyon	H	29	RTHA	435547	3751095	U	U	FL	1					
Chino Canyon	H	30	RTHA	435598	3751008	U	U	FL	2					
Chino Canyon	H	31	RTHA	436049	3750753	U	ASY	FL	1					very white upper covert feathers/leading edge of wings
Chino Canyon	H	32	RTHA	436626	3750218	U	U	FL	1					
Chino Canyon	H	33	RTHA	436935	3749374	U	ASY	FL	1					
Chino Canyon	H	34	RTHA	437019	3748551	U	U	PE	1					on wire by train tracks
Coal Canyon	**H**	**35**	**GOEA**							**F**	**E**	**R**	**N**	**newly found nest**
Coal Canyon	**H**	**36**	**GOEA**			**U**	**ATY**	**FL**	**1**					**joined by GOEA WP37**
Coal Canyon	**H**	**37**	**GOEA**			**U**	**ATY**	**FL**	**1**					**seen flying with GOEA WP36, possibly from nest WP35**
Coal Canyon	**H**	**38**	**GOEA**	**437543**	**3745457**					**P**	**E**	**R**	**N**	**newly found nest; falling apart, rocks in nest**

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
Coal Canyon	H	39	CORA	437285	3745411					G	E	R	N	39a
Coal Canyon	H	39	CORA	437285	3745411					G	E	R	N	39b
Coal Canyon	H	40	RT/CR	437096	3746291					G	E	R	U	40a
Coal Canyon	H	40	CORA	437096	3746291					G	E	R	U	40b
Coal Canyon	H	41	CORA	436007	3745275	U	U	FL	1					
Coal Canyon	H	42	PEFA	437774	3743253	U	AHY	PE/FL	2					cavity
Coal Canyon	H	43	RT/GE							F	NW	R	N	43a
Coal Canyon	H	43	CORA							G	NW	R	N	43b
Coal Canyon	H	44	RT/GE							F	NW	R	N	
Coal Canyon	H	45	TUVU	437546	3742760	U	U	FL	4					probably cave nest nearby
Trabuco Canyon	H	46	RTHA	453019	3732473	U	ASY	IN	1	G	-	Tr	Y	
Lake Elsinore	H	47	TUVU	464554	3732040	U	U	FL	1					
Lake Elsinore	H	48	CORA	466660	3731951	U	U	PE/FL	2					
Lake Elsinore	H	49	RTHA	476397	3719912	U	U	FL	1					
Jurupa Hills	H	50	CORA	459584	3766739	U	U	FL	2					
Crestline	H	51	CORA	470497	3787930	U	U	FL	2					
Crestline	H	52	RTHA	470512	3787974	U	U	FL	1					
Crestline	H	53	RTHA	468566	3789141	U	U	FL/PE	1					
Crestline	H	54	RTHA	472444	3786642	U	U	FL	1					
Crestline	H	55	RTHA	477704	3783323	U	ASY	FL/HU	1					
Crestline	H	56	RTHA	478318	3783464	U	ASY	FL	2					one is a dark morph
Crestline	H	57	MD	478955	3783327	U	U		1					walking
Crestline	H	58	COHA	479536	3783445	F	AHY	FL	1					58a
Crestline	H	58	RTHA	479536	3783445	U	U	FL	1					58b

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
San Bernardino Mountains	H	59	AMKE	485143	3780430	F	U	PE	1					Harrison Mountain
San Bernardino Mountains	H	60	CORA	485534	3780349	U	U	FL	3					Harrison Mountain
San Bernardino Mountains	H	61	CORA	487576	3779038	U	U	FL	2					Harrison Mountain
San Bernardino Mountains	H	62	AMKE	487694	3778451	U	U	FL	2					Harrison Mountain
San Bernardino Mountains	**H**	**63**	**GOEA**			**U**	**ATY**	**FL**	**1**					**no white feathers, adult fifth year+; Plunge Creek**
San Bernardino Mountains	H	64	AMKE	489056	3778085	F	U	FL	1					64a: Plunge Creek
San Bernardino Mountains	H	64	CORA	489056	3778085	U	U	FL	1					64b: Plunge Creek
San Bernardino Mountains	H	65	RTHA	494197	3778421	U	U	FL	1					Keller Creek
San Bernardino Mountains	H	66	RTHA	496233	3781220	U	ASY	IN	1	G	SW	R	Y	Keller Creek
San Bernardino Mountains	H	67	PEFA	495431	3780946	U	AHY	FL	1					Keller Creek
San Bernardino Mountains	H	68	RTHA	495429	3780808	U	ASY	IN	1	G	SW	R	Y	Keller Creek
San Bernardino Mountains	H	69	CORA	495761	3780943	U	AHY	IN	1	G	SW	R	Y	Keller Creek Keller Creek
San Bernardino Mountains	H	70	RTHA	495806	3780939					G	S	R	N	Keller Creek
San Bernardino Mountains	H	71	RT/CR	495849	3780952					G	S	R	N	71a: Keller Creek
San Bernardino Mountains	H	71	RT/CR	495849	3780952					G	S	R	N	71b: Keller Creek

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
San Bernardino Mountains	H	72	RT/CR	494429	3777978					G	S	R	U	Keller Creek
Morton Peak	H	73	RTHA	491472	3773438	U	ASY	FL	1					
Morton Peak	H	74	RTHA	493624	3773288	U	ASY	FL	1					
San Bernardino Mountains	H	75	CORA	501080	3770900	U	U	FL	3					Mill Creek Canyon
San Bernardino Mountains	H	76	RTHA	500797	3770688					P	S	R	N	Mill Creek Canyon
San Bernardino Mountains	H	77	CORA	500652	3770786	U	U	FL	1					Mill Creek Canyon
San Bernardino Mountains	H	78	CORA	501643	3771318	U	U	FL/PE	2					Mill Creek Canyon
Allen Peak	**H**	**80**	**PEFA**			**U**	**AHY/HY**	**PE**	**2**	**P**	**SE**	**R**	**N**	**80a: old GOEA nest (K127b from 2011) with immature falcon on it, adult falcon seen on cliff; Allen Creek**
Allen Peak	**H**	**80**	**GOEA**							**P**	**SE**	**R**	**N**	**80b: (K127a from 2011)**
Allen Peak	H	80	CORA							G	SE	R	N	80c: Allen Creek
San Bernardino Mountains	H	81	CORA	502034	3769963	U	U	PE/FL	1					Mill Creek Canyon
San Bernardino Mountains	H	82	CORA	505750	3769283	U	U	FL	15					15+ individuals, Mill Creek Canyon
San Bernardino Mountains	H	83	COHA	519392	3764944	U	U	FL	1					Whitewater Canyon
San Bernardino Mountains	H	84	COHA	523312	3761190	U	U	FL	1					Whitewater Canyon
San Bernardino Mountains	H	85	RTHA	523764	3765856	U	ASY	FL	2					85a: Whitewater Canyon
San Bernardino Mountains	H	85	CORA	523764	3765856	U	U	FL	1					85b: Whitewater Canyon

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
Whitewater Canyon	**H**	**86**	**GOEA**			**F**	**ATY/E**	**IN**	**3**	**G**	**R**	**NE**	**Y**	**86a: 1 adult plus 2 eggs, newly found nest; Whitewater Canyon**
Whitewater Canyon	**H**	**86**	**GOEA**			**M**	**ATY**	**PE/FL**	**1**					**86b: Whitewater Canyon**
Whitewater Canyon	**H**	**86**	**GOEA**							**G**	**NE**	**R**	**P**	**86c: newly found nest; Whitewater Canyon**
Little San Bernardino Mountains	**H**	**87**	**GOEA**							**G**	**NW**	**R**	**N**	**(Y307 from 2011)**
Little San Bernardino Mountains	**H**	**88**	**GOEA**							**G**	**SE**	**R**	**Y**	**(Y306 from 2011)**
Little San Bernardino Mountains	H	89	AMKE	546285	3766260	U	U	FL	2					
Little San Bernardino Mountains	H	90	CORA	543632	3763546	U	U	FL	1					
Little San Bernardino Mountains	H	91	RTHA	540171	3761674	U	ASY	FL	1					
San Bernardino Mountains	H	92	RTHA	510575	3756111	U	ASY	FL	1					
San Bernardino Mountains	H	93	RTHA	501115	3755930	U	ASY	FL	1					
The Badlands	H	94	CORA	487757	3760016	U	U	FL	3					
Jurupa Hills	H	95	SWHA	460541	3763302	U	U	FL	70					70+ individuals kettling up to migrate North
Box Springs Mountain	H	96	CORA	474777	3757476	U	U	FL	4					

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
Box Springs Mountain	H	97	RTHA	474429	3759054	U	U	FL	1					97a
Box Springs Mountain	H	97	TUVU	474429	3759054	U	U	FL	1					97b
Box Springs Mountain	H	97	SWHA	474429	3759054	U	U	FL	1					97c
Box Springs Mountain	H	98	RTHA	471868	3761412	U	U	PE/FL	1					
Box Springs Mountain	H	99	TUVU	474076	3757615	U	U	FL	1					
Box Springs Mountain	H	100	CORA	477782	3760838	U	U	FL	1					
Box Springs Mountain	H	101	CORA	481129	3760688	U	U	FL	2					
The Badlands	H	102	RTHA	486665	3759408	U	ASY	FL	1					
The Badlands	H	103	RTHA	486632	3759842	U	ASY	IN	1	G	W	R	Y	
The Badlands	H	104	CORA	488685	3759203	U	U	FL	2					
The Badlands	H	105	CORA	489165	3758552	U	U	FL	2					
The Badlands	H	106	CORA	489574	3757598	U	U	FL	1					
The Badlands	H	107	RTHA	489734	3757660	U	ASY	FL	2					
The Badlands	H	108	CORA	491583	3756915	U	AHY	IN/FL	2	G	S	R	Y	
The Badlands	H	109	CORA	494185	3753637	U	U	FL	1					
The Badlands	H	110	RTHA	496634	3752317	U	ASY	FL	1					
The Badlands	H	111	CORA	498597	3750729	U	U	FL	1					
The Badlands	H	112	RTHA	500803	3749559	U	ASY	FL	1					
Soboba Hills N	H	113	CORA	508524	3749930	U	U	FL	1					
Soboba Hills N	H	114	RTHA	514173	3749624	U	ASY	PE/FL	1					

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
San Jacinto Mountains	H	115	CORA	520528	3749809	U	AHY	PE	2					possible nest/perch
San Jacinto Mountains	H	116	CORA	521635	3749076	U	U	FL	3					
San Jacinto Mountains	H	117	RTHA	522987	3747863	U	U	FL	2					
San Jacinto Mountains	H	118	CORA	523003	3747707	U	U	FL/PE	12					12+ individuals
San Jacinto Mountains	H	119	PRFA	522986	3747567	U	AHY	PE	2	U	N	R	Y	119a: cavity, possibly incubating
San Jacinto Mountains	H	119	CORA	522986	3747567	U	U	FL	3					119b
San Jacinto Mountains	H	120	CORA	524288	3746627	U	U	FL	2					
San Jacinto Mountains	H	121	GHOW	523945	3748250	U	U	FL	1					
San Jacinto Mountains	H	122	CORA	524130	3748045					F	N	R	N	
San Jacinto Mountains	H	123	RTHA	525874	3748569	U	ASY	FL	1					
San Jacinto Mountains	**H**	**124**	**GOEA**							**F**	**W**	**R**	**N**	**(Y243 from 2011)**
San Jacinto Mountains	**H**	**125**	**GOEA**							**G**	**W**	**R**	**N**	**(likely Y244 from 2011)**
San Jacinto Mountains	H	126	CORA	539584	3744274	U	U	FL	5					
San Jacinto Mountains	H	127	RTHA			U	ASY	PE/IN	1	G	E	R	Y	old GOEA nest
San Bernardino Mountains	H	128	RTHA	528758	3757332	U	ASY/E	IN	3	G	W	R	Y	128a: 1 adult plus 2 eggs

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
San Bernardino Mountains	H	128	BNOW	528758	3757332	U	U	PE	1					128b
San Bernardino Mountains	H	129	RTHA	527621	3758139	U	U	FL	1					
San Bernardino Mountains	H	130	CORA	518824	3756773	U	U	FL	1					
San Bernardino Mountains	H	131	RTHA	506083	3765501	U	ASY	FL	1					
Jurupa Hills	H	132	CORA	459454	3764422	U	U	FL	1					
Coal Canyon	**J**	**2**	**GOEA**			**U**	**ATY**	**FL/PE**	**1**	**G**	**NE**	**R**	**Y**	**flew to pinnacle nest, (H35 from 2013 Phase 1)**
Soboba Hills E	J	4	MD	504958	3745260	U			3					
Soboba Hills E	**J**	**5**	**GOEA**			**U**				**G**	**W**	**R**	**N**	
Soboba Hills E	**J**	**6**	**GOEA**			**U**	**L**	**PE**	**1**	**G**	**W**	**R**	**Y**	**2 weeks old (H7 from 2013 Phase 1)**
Soboba Hills N	**J**	**8**	**GOEA**			**U**	**L**	**PE**	**2**	**G**	**W**	**R**	**Y**	**6-7.5 weeks old (H9 from 2013 Phase 1)**
Whitewater Canyon	**J**	**9**	**GOEA**			**U**	**ATY**	**PE/FL**	**1**					**flew from nest**
Whitewater Canyon	**J**	**10**	**GOEA**			**U**	**L**	**PE**	**2**	**G**	**S**	**R**	**Y**	**4 weeks old (H86 from 2013 Phase 1)**
Little San Bernardino Mountains	**J**	**11**	**GOEA**			**U**				**G**	**N**	**R**	**P**	**west side of canyon**
Little San Bernardino Mountains	**J**	**12**	**GOEA**			**U**				**G**	**W**	**R**	**P**	**east side of canyon (H88 from 2013 Phase 1); very windy, difficult to photograph or document if any new activity since Phase 1; no chicks observed.**

Geographical Area	Trip ID	Waypoint	Species Code	UTM Zone 11N		Sex	Age	Behavior	Quantity	Nest Condition	Nest Aspect	Substrate	Activity	Comments
				X	Y									
The Badlands	J	13	RTHA	491269	3758550	U	ASY	PE	2					on transmission tower

Species: AMKE=American Kestrel, BNOW=Barn Owl, COHA=Cooper's Hawk, CORA=Common Raven, GHOW=Great Horned Owl, GOEA=Golden Eagle, MD=Mule Deer, NOHA=Northern Harrier, PEFA=Peregrine Falcon, PRFA=Prairie Falcon, RT/CR=Red-tailed Hawk or Common Raven, RT/GE=Red-tailed Hawk or Golden Eagle, RTHA=Red-tailed Hawk, SWHA=Swainson's Hawk, TUVU=Turkey Vulture.
Sex Codes: M=Male, F=Female, U=Unidentified.
Age Class Codes: AHY=After Hatch Year, ASY=After Second Year, ATY=After Third Year, E=Egg, HY=Hatch Year, L=Local (nestling), SY=Second Year, U=Unidentified.
Behavior Codes: FL=Flying, HU=Hunting, IN=Incubating, PE=Perched.
Nest Condition Codes: F=Fair, G=Good, P=Poor, U=Undetermined.
Nest Aspect Code: E=East, N=North, S=South, W=West.
Nest Substrate Code: R=Rock, TT=Transmission Tower.
Nest Activity Code: N=No, P=Possible, U=Unknown, Y=Yes.
Note: falcon nest condition is undetermined in some cases as they do not build their own nests and the eyrie may only be a cliff ledge or a conglomerate of old mutes.

Photographs of Golden Eagle Nests and Other Observations

Photo 8. Adult golden eagle incubating eggs in the Soboba Hills N nest (H9) on March 27, 2013 (wide-angle lens photo).

Photo 9. Two golden eagle chicks in Soboba Hills N nest (J8) on 10-May 10, 2013, aged approximately 6 to 7.5 weeks. One chick was lying down in center of nest.

Photo 10. Adult golden eagle incubating in the active Soboba Hills E nest (H7) on March 27, 2013 (zoom lens photo).

Photo 11. Single golden eagle chick observed in the active Soboba Hills E nest (J6) on May 10, 2013, aged approximately 2 weeks. Much of the nest material observed in Phase 1 surveys appeared to have fallen out of the nest cavity.

Photo 12. Adult golden eagle incubating in Whitewater Canyon nest (H86a) on March 28, 2013 (zoom lens photo).

Photo 13. Two golden eagle chicks observed in Whitewater Canyon nest (J10) on May 10, 2013, aged approximately 4 weeks old.

Photo 14. Female adult golden eagle flying (J9) next to her nest in Whitewater Canyon on May 10, 2013.

Photo 15. Adult golden eagle flying (H63) 6.9 nautical miles from the project alignment over Plunge Creek in the San Bernardino Mountains on March 28, 2013 (zoom lens photo).

Photo 16. Adult golden eagle perched (J2) on nest in Coal Canyon on May 10, 2013.

Photo 17. Active golden eagle nest (H88) observed in the Little San Bernardino Mountains on March 28, 2013.

Photo 18. Inactive golden eagle nest (H80b) in poor condition observed in the Allen Peak territory on March 28, 2013.

Photo 19. Inactive golden eagle nest (H125) in good condition observed in the San Jacinto Mountains on March 29, 2013.

Photo 20. Red-tailed hawk nest with 3 eggs (H15b) in the Chino Hills on March 27, 2013 (zoom lens photo).

Photo 21. Adult peregrine falcon (H80a) beginning to take off from cliff on Allen Peak March 28, 2013 (zoom lens photo).

DISCUSSION OF FINDINGS

This report provides the findings of the 2013 Phase 1 and 2 surveys for golden eagles and other raptors conducted by WRI for the WOD Upgrade Project in order to comply with the U.S. Fish and Wildlife Service recommendations (Pagel *et al*. 2010). Surveys for this project were conducted via helicopter to determine golden eagle occupancy and productivity status in and around the spatial buffer of the proposed project.

WRI recorded 14 golden eagle nests that comprised 7 territories; 5 active and 2 not active. One of the territories is within the 2,000-square-kilometer spatial buffer of the proposed project and produced 2 chicks (Soboba Hills N). Of the other 6 territories with nests outside of the 4-nautical-mile golden eagle spatial buffer, 5 were within 3.5 nautical miles of the spatial buffer and 1 was 17.5 nautical miles away. Of these territories outside the project spatial buffer, 2 produced a total of 3 young (Soboba Hills E, Whitewater Canyon), 2 were active but not productive (Coal Canyon, Little San Bernardino Mountains) and 2 were not active (Allen Peak, San Jacinto Mountains).

A total of 12 unique individual golden eagles and 304 other wildlife documentations were made that included species such as the American kestrel, barn owl, Cooper's hawk, common raven, great horned owl, mule deer, northern harrier, peregrine falcon, prairie falcon, red-tailed hawk, Swainson's hawk and turkey vulture.

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APPENDIX A
Wildlife Research Institute Golden Eagle Team

Note: Not all individuals, necessarily, participated in this survey.

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

Mr. Bittner is a Co-founder and Director of the Wildlife Research Institute, Inc. (WRI) and has been a Wildlife Biologist since 1967. Much of his work has been with raptors of various species but he has also been involved in preliminary research (sexing, aging, building release facilities) and initial releases of the California Condor (*Gymnogyps californianus*) in California and Arizona, studied and banded 3,700 Great Blue Herons (*Ardea herodias*), conducted mammal research, and trapped and tagged over 3,000 mammals of various species. Dave currently coordinates an annual Golden Eagle (*Aquila chrysaetos*) and raptor population study throughout Southern California, including the Western Mojave Desert and the Anza-Borrego Desert State Park. He is the current Primary Investigator (P.I.) for the Southern California Golden Eagle Population Study, the longest continuous running Golden Eagle study of its kind in the Western Hemisphere that began in 1867. Dave's involvement began in 1968 in the Western Mojave but now includes all of Southern California. 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, Nevada Department of 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 thousands of raptors since 1963 and has banded over 480 Golden Eagles, including more than 150 with VHF and satellite telemetry. He has conducted Bighorn Sheep (*Ovis canadensis*) surveys, both aerial and ground, for Desert Bighorn Sheep (*O. canadensis nelson*) in the Mojave Desert and for Peninsular Bighorn Sheep (*O. canadensis sierra)* 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. Dave has worked for the US Fish and Wildlife Service, Cleveland Museum of Natural History, and the Ohio Department of Natural Resources and has taught at two universities and one technical college. His education includes a B.S. in Zoology and Wildlife Management from Ohio State University (1968). He also conducted graduate studies in Avian Reproduction and Natural Resources (1975-1977) at The Ohio State University.

Leigh Bittner
Vice-President, WRI
Field Assistant

Leigh Bittner first flew Golden Eagle helicopter surveys in 1996. She has participated in Golden Eagle nest surveys, nest observations, eagle banding, tagging and tracking in California since 1991, in Montana since 2000, and in New Mexico since 2001. Leigh has also been involved in the tagging and releasing of some of the first California Condors in California, 1992, and in 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 Cards, Inc. and serves on the WRI Human Resources Committee. Leigh did her undergraduate work at the University of Georgia School of Journalism and University of Missouri at Kansas City.

Chris Meador
Assistant Director, WRI
Senior Wildlife Biologist
Mr. Meador is the Assistant Director and a full-time Wildlife Biologist for WRI. He has been participating in Golden Eagle and raptor research with WRI since 2000. His experience includes migration counts, point counts, ground and aerial observations, nest monitoring, nest camera installations via helicopter long-line, trapping, marking and banding. Chris started conducting helicopter surveys for Golden Eagles and other raptors in 2008, which includes over 350 hours of intensive helicopter survey experience. In 2001, he assisted in the launch of WRI's Golden Eagle and raptor annual migration project in Wolf Creek, Montana; he has been helping to lead this project since 2007. He has conducted numerous raptor surveys for federal, state, county and local governments, and the private sector across desert, coastal and mountain habitats in the US and Mexico. 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 since 2000. 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 Southern California and Nevada as well as migrating Golden Eagles in Montana. He maintains and oversees much of WRI's tracking process including gathering, interpreting and publishing data using GPS and GIS integration. Chris has conducted both aerial and ground Bighorn Sheep surveys 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 (*Athene cunicularia*) to desert tortoises (*Gopherus agassizii*). Chris 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 Western North American raptors. He holds a B.A. (2008) with a double major in Environmental Studies and Psychology from Prescott College in Prescott, Arizona.

James Hannan, Ph.D.
Senior Wildlife Biologist
Dr. Hannan has been working with WRI since 1995 conducting research on raptors, specializing in Golden Eagles in California, Montana and Mexico. His involvement includes ground and helicopter surveys, rappelling into nests, banding and marking, and VHS monitoring of Golden Eagles. He has also participated in WRI Burrowing Owl surveys and captive breeding, as well as field surveys and capture/banding of numerous other raptor species. He was the Lead Biologist and main speaker at WRI's winter Hawk Watch many times since 1996. Jim worked with raptors as a falconer earlier in his career. His field work includes the western US and also Florida where he received his Ph.D. and taught at Florida Institute of Technology for 3 years. He was an international environmental consultant on the staff of the Smithsonian Institution in Washington D.C. after serving 2 years as a Peace Corps Volunteer, two Peace Corps staff positions, and teaching environmental sciences in Costa Rica and Kenya. He spent 12 years as a private environmental consultant (contracts included Mexican aquaculture, impacts on coral reefs, game studies on deer and other species for California Department of Fish and Game, etc.). He also managed and directed a Texas native game ranch for 3 years, served as a naturalist in East Africa for a wildlife filming company, and led the Florida Keys Fishing Guides association in their successful effort to expel commercial fishermen from the Everglades National Park. He holds a NAUI divers certificate and a Florida EMT certificate. He is currently Professor Emeritus from

Mesa College in San Diego where he taught ecology and field biology for 21 years. He received his B.S. in 1965 from Humboldt State University, his M.S. in 1969 from University of Oregon, and his Ph.D. in 1973 from the University of Miami, Florida.

Marcus Collado
Wildlife Biologist
Mr. Collado is a full-time Wildlife Biologist for WRI. He has conducted ground and aerial surveys for Golden Eagles for a pre-construction wind power site in Arizona and, as part of the WRI Golden Eagle team, has conducted migration counts, point counts, ground observations, nest monitoring and nest camera installations via helicopter long-line for Golden Eagles and other raptors throughout 2011. He also gained valuable raptor experience while surveying and capturing the Mexican Spotted Owl (*Strix occidentalis lucida*) in Arizona and New Mexico. Marcus has logged over 1,200 hours of Golden Eagle aerial and ground field experience in Arizona and California since 2011. Prior to joining WRI, he participated in various scientific studies, including a Common Loon (*Gavia immer*) population demography and heavy metal toxin analysis in western Maine and a diatom research project in alpine lakes in Montana, Wyoming, and Washington. In Alabama, Marcus helped conduct avian, herpetological and vegetation surveys on State DCNR lands for use in identifying species of greatest conservation need. He has conducted wildlife surveys since 2009 for various taxa across the US. Marcus has trained technicians in capturing and PIT-tagging rattlesnakes and Gila monsters (*Heloderma suspectum*) and capturing and relocating the Chiricahua leopard frog (*Lithobates chiricahuensis*). He worked with the Arizona Game and Fish Department to survey for the Threatened Apache Trout and relocate Gila Trout and, with the USFWS, has collected, transported, and released the four ESA-listed fish species of the Yaqui River Watershed. His experiences include nocturnal migration surveys for birds and bats using radar and night vision equipment, surveying for desert tortoise and Crissal thrashers (*Toxostoma crissale*) in the Mojave Desert, and assisting with bat mist-netting in the Amazon Basin. Marcus graduated from the University of Maine in 2009 with a B.S. in Wildlife Ecology.

Katie Quint
Wildlife Biologist
Ms. Quint is a full-time Wildlife Biologist with WRI and has conducted Golden Eagle aerial and ground surveys in California and Nevada since 2011. Her eagle and raptor work includes occupancy and productivity surveys, migration and point counts, and nest monitoring at construction sites. The latter was completed for both Golden Eagles and Burrowing Owls. Additionally, during the migration season she conducted ground observations, trapping and banding during WRI's 4-week intensive Golden Eagle and raptor annual migration project in Wolf Creek, Montana in 2011. Katie has logged over 800 hours of Golden Eagle aerial and ground field experience since June, 2011. Katie's experiences have also involved animal husbandry and training of over 60 species of large captive ungulates, small mammals, reptiles, and birds at both accredited and non-profit private zoos in Hawaii and North Carolina, respectively. She has committed herself to volunteer efforts for various animal shelters and zoos since 2007 where she specialized in designing and presenting educational programs on animal conservation, ecology and disease prevention, in addition to providing animal care. She is a member of WRI's Education Committee and is part of the organizing team for the Hawk Watch programs given at WRI headquarters. Katie received her B.S. in Zoology with a minor in Psychology from North Carolina State University in 2010.

Renée Rivard, Pharm.D.
Wildlife Biologist
Dr. Rivard is a Wildlife Biologist with WRI. She has accumulated approximately 300 hours of intensive helicopter survey time and over 400 hours of ground-based field work while participating in numerous Golden Eagle projects conducted by WRI since 2010 across desert and mountain habitat in the Mojave, Sonoran and Great Basin deserts in Southern California, Nevada and Baja Mexico. In addition to participating in aerial and ground surveys to identify Golden Eagle nests and territories 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. Renée also gained valuable raptor trapping and observation experience during her participation in WRI's 4-week intensive Golden Eagle and raptor annual migration project in Wolf Creek, Montana, in 2010. Renée assists with WRI's annual Hawk Watch educational program in the Ramona Grasslands about its raptor residents and migrants, and helps maintain Burrowing Owl artificial burrows on premises at WRI headquarters. While conducting research at WRI, she has gained skills and experience repelling into cliff-dwelling raptor nests, banding nestling and adult Golden Eagles, trapping with bal-chatri traps and bow nets, installing nest cameras, as well as applying patagial tags, VHF transmitters and satellite transmitters. 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. Since 2007, she has accumulated diverse and valuable wildlife knowledge and skills as a wildlife and raptor rescuer, rehabilitator, and wildlife veterinarian assistant for non-profit organizations in Australia and California, 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. While in Australia, she assisted with mist netting of megachiroptera and locally continues to participate in reptile pitfall trap and Cactus Wren surveys in Coastal Sage Scrub habitat, and monitoring of wildlife cameras throughout San Pasqual Valley in Southern California. In 2009, she completed a 2-day banding workshop at the Starr Ranch MAPS station in Trabuco Canyon, California. She currently manages WRI's banding database and serves as the WRI Data and Report Manager. Renée received a B.S. 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).

James Newland
Field Technician
Mr. Newland is a Field Technician with WRI and has assisted with Golden Eagle and raptor research since 2005. He been conducting ground surveys of Golden Eagles and other raptors for WRI since 2006 and aerial surveys since 2009; he has logged over 1,800 hours of in-depth Golden Eagle field experience since 2010. As a member of the WRI Golden Eagle Team, James has banded, trapped, helped affix VHF and satellite transmitters, and tracked Golden Eagles. He has been trapping migrating Golden Eagles and other raptors since 2009 during WRI's annual intensive 4-week migration project each fall in Montana and his proficient with Bal-chatri and bow net traps. He currently manages WRI's information technology systems, equipment and facilities. As the owner of a parrot farm since 1979, James has numerous years of experience raising and breeding parrots, collecting blood and feather samples, utilizing cage traps, as well as banding and processing over 500 psittacines. James has a B.S. in Industrial Arts and has worked for numerous large communication corporations as a Telecommunications Administrator and Systems Analyst.

Jeff Wells
Volunteer Wildlife Biologist, USFS
Mr. Wells, a Wildlife Biologist for the US Forest Service, has been involved with WRI's Golden Eagle research since 1991 including trapping, banding and tracking. Jeff has been conducting helicopter surveys of Golden Eagles and other raptors with WRI since 2000. He has a B.S. in Wildlife Studies from San Diego State University and has worked as a private wildlife biologist since 1991.

Jeff Laws
Volunteer 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 experience conducting helicopter surveys of Golden Eagles and other raptors with WRI since 2006. Jeff works as a climber and field installer for San Diego Gas & Electric Company.

Mel and Curtis Cain
Pilots, Utility Helicopters
Mr. Mel Cain has been flying helicopters for wildlife surveys since 1955. His son, Curtis, started flying helicopters commercially at the age of 18 years in 1985 and later became a commercial airline pilot in 1990. Utility Helicopters, with their Hughes-500 helicopters, has assisted WRI in Golden Eagle and raptor surveys since 2000 in the United States and Mexico. Mel and Curtis have amassed years of experience in New Zealand trapping and transporting big game including deer and elk. They have conducted hundreds of netting and translocations of Bighorn Sheep and Tule Elk (*Cervus Canadensis nannodes*) in California for California Fish and Game and California State Parks. Much of Curtis' helicopter work has focused on animal surveys, specifically with live capture of deer, goats, wild horses, bighorn sheep and birds in Canada, Mexico, New Zealand and the US. Mel works frequently in Mexico and Canada and maintains NAFTA and Mexican permits to conduct wildlife and resource surveys.