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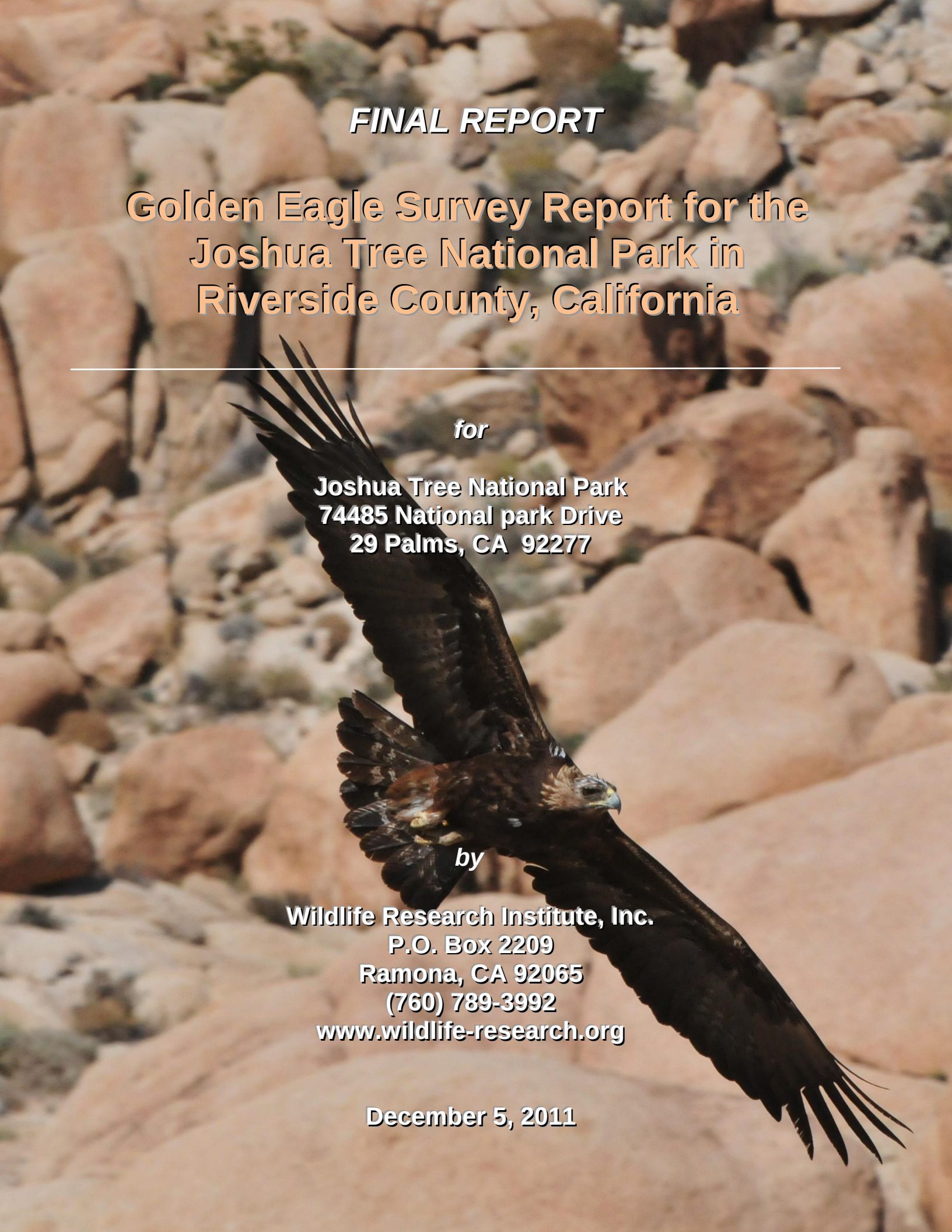

FINAL REPORT

Golden Eagle Survey Report for the Joshua Tree National Park in Riverside County, California

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for

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Cover Photo//Adult golden eagle observed in the Eagle Mountains flying with young (not pictured); Y80.

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SUMMARY

This document provides the findings of the Phase 1 occupancy and Phase 2 productivity surveys for golden eagles conducted within a portion of the Joshua Tree National Park (JTNP) in Riverside County, California. A total of 22 golden eagle nests were observed comprising 9 territories. Four of the 9 golden eagle territories were active for the 2011 season (Eagle Mountains - West Central, Eagle Mountains – West Northwest, Hexie Mountains - Central, Little San Bernardino - East), the 2 Eagle Mountain territories were the only productive territories and produced a total of at least 3 young.

During the surveys, 9 golden eagles and 10 other wildlife species (i.e., barn owl [*Tyto alba*], bighorn sheep [*Ovis canadensis*], bobcat [*Lynx rufus*], common raven [*Corvus corax*], coyote [*Canis latrans*], great horned owl [*Bubo virginianus*], peregrine falcon [*Falco peregrinus*], prairie falcon [*Falco mexicanus*], red-tailed hawk [*Buteo jamaicensis*] and turkey vulture [*Cathartes aura*]) were observed totaling 273 unique 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 have dropped to as low as 12% in some regions, such as the Mojave and Sonora Deserts of the American Southwest (Bittner et al. 2003).

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. 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 unpublished data).

WRI has learned, based on 23 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.

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.

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.

Example of a nest in fair condition

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

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.

Example of an active nest with new material in bowl

Example of an occupied nest with an incubating female golden eagle

Example of an inactive nest that is deteriorating

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.

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: A01GE**2**SN, where A is a unique trip identifier, 01 is the waypoint number, GE is the species of the nest builder, 2 is the number of nests at the waypoint, and SN is the type of nest such as "stick nest."

Territory Terminology

According to the USFWS Interim Golden Eagle Guidance (Pagel et al. 2010), all nest sites within a breeding territory are deemed occupied while raptors are demonstrating pair bonding activities and developing affinity to a given area.

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 survey area covered approximately 810 square miles across the Colorado Desert Region in Joshua Tree National Park (JTNP), Riverside County, California (Figure 1).

The survey area included the Cottonwood, Coxcomb, Eagle, Hexie and Little San Bernardino Mountains, as well as, Mecca Hills. The terrestrial habitat consisted mostly of creosote bush scrub, yucca and cholla cactus, desert saltbush and sandy soil grasslands; higher elevations were predominantly pinyon pine, rock outcrops and California juniper.

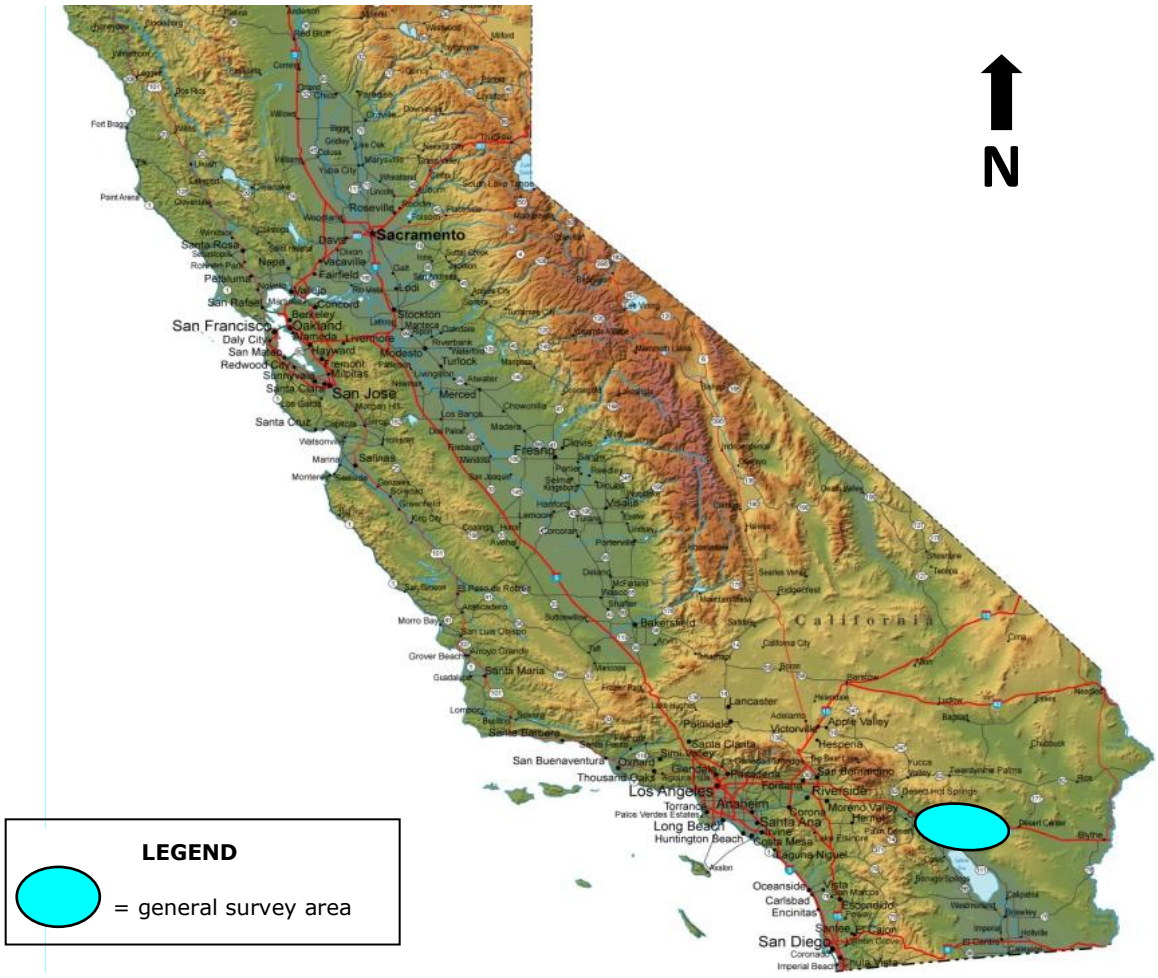


Figure 1. Map of JTNP Survey Area.

METHODS AND CONSTRAINTS

Methods

WRI conducted golden eagle aerial surveys within portions of the JTNP. Golden eagle nests and their associated territories were documented and named according to USFWS recommendations (Table 1); wildlife observed, including other raptors and special status species, were documented and counted (Table 2); and descriptive data for each observation were recorded on the transect data sheet (Table 3). The activity status of all golden eagle nests were determined during the survey, if possible, and/or confirmed later upon review of photographs. Even in the absence of incubating females or observations of adult golden eagles *per se*, 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 assess activity at the nest site for the 2011 breeding season.

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. Additionally, special research permits were acquired from the Joshua Tree National Park (JTNP).

All surveying and reporting complies with the current U.S. Fish and Wildlife Service Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al. 2010) and the subsequent Draft Eagle Conservation Plan Guidance (Gould and Schmidt 2011).

Survey

Helicopter surveys, or ground surveys in areas where aerial surveys were not permitted, were conducted for Phase 1on May 2nd-4th, 2011; phase 2 surveys were conducted at least 30 days later on June 7th-10th, 2011 according to USFWS recommendations (Pagel et al 2010, Gould and Schmidt 2011). These surveys were conducted for the target species, golden eagle, in the Colorado Desert Region of the Sonoran Desert in Riverside County, California. We utilized a Hughes-500 helicopter that provided seating for three wildlife biologists (including at least 2 golden eagle specialists) and the pilot. The pilot used by WRI for these surveys also has extensive golden eagle experience; refer to the WRI Golden Eagle Team biographical sketches for more detail (Appendix A).

Because aerial observations were not permitted in some areas for Phase 1 surveys due to bighorn sheep lambing season (see Constraints), Phase 2 surveys focused not only on confirming productivity but also sought to determine occupancy in areas not previously surveyed during the Phase 1 time period. We concentrated on any area with suitable golden eagle nesting habitat with possible nesting substrate. These included cliffs with geological features, such as flat ledges or shallow cavities/caves, that allow for safe nest construction and were high enough to provide protection from ground-dwelling predators. WRI also used data acquired from our own aerial surveys in previous years to identify golden eagle nesting areas and streamline ground surveys. These surveys included all or part of every mountain range in the study area. 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 and Sonoran Deserts.

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 (Table 3).

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 from a distance 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 other wildlife species observed. The following data were also specifically collected however, per the request of federal agencies, map coordinates for nests of sensitive species (i.e., golden eagle, peregrine falcon, and prairie falcon) are not included in this report but are on file at WRI and are available upon request:

- 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 (e.g., cliff, transmission tower, tree, 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 and great horned owls, sometimes utilize golden eagle nests for their own nesting. 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 3). 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.

Constraints

Bighorn sheep, which are sensitive to helicopters, share the same type of cliff complexes for lambing that are used by golden eagles for nesting. Due to concomitant bighorn sheep lambing season, including that of the threatened and endangered peninsular bighorn sheep in some areas, aerial observations were not permitted by California Department of Fish and Game (CDFG) for Phase 1 surveys in the Cottonwood and Eagle mountain ranges. Ground observations were

therefore conducted in these areas, where possible, for Phase 1. However, due to the size and complexity of these ranges, it was difficult to make thorough observations of golden eagle nests and/or territories solely by ground. Ground observations are inherently less effective in both finding nests and determining nest activity, especially in the absence of observing birds at the nest. Indirect evidence of nest activity (fresh greenery or new sticks in the nest) is difficult or impossible to observe from the ground and/or at distances required to prevent disturbance to the nesting area. Therefore, in the absence of Phase 1 helicopter-based observations, the actual golden eagle occupancy of these mountain ranges is likely to be underestimated because breeding attempts that failed early in the breeding season (prior to and during the Phase 1 time period of February to April) would not have been observed or documented.

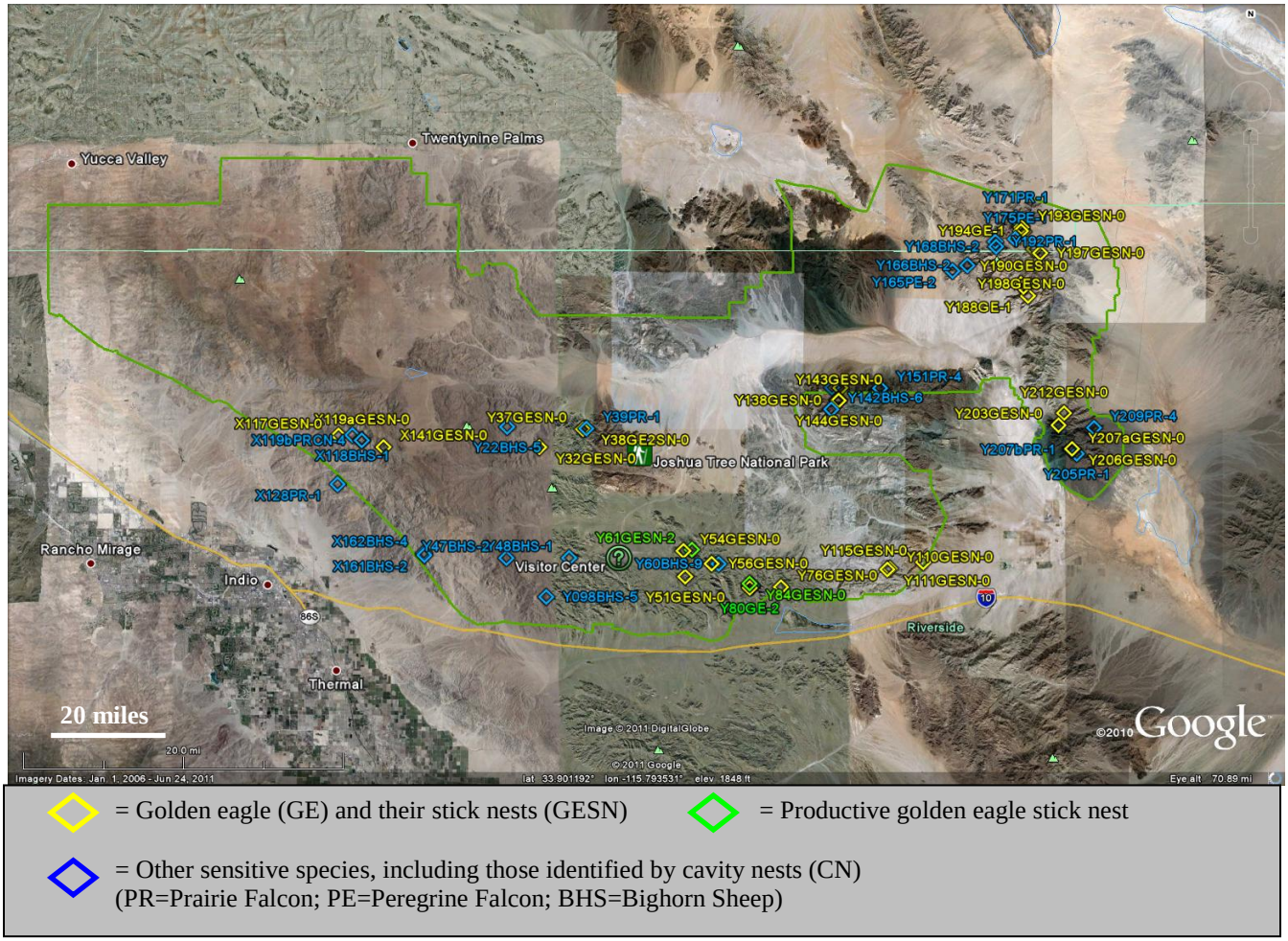
Because Phase 2 surveys are recommended by the USFWS to be conducted at least 30 days after Phase 1 and because the JTNP permit (Appendix B) was not received until June, Phase 2 surveys were also conducted later than desired. Consequently, the actual number of productive territories and/or number of young produced is therefore also likely to be underestimated in the Cottonwood and portions of the Eagle mountain ranges because fledging, which often occurs between May and June in Southern California, may have already occurred.

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 correctly extrapolated from these surveys except for the focus species, golden eagle.

RESULTS

Map of Golden Eagles, Nests and Sensitive Species from Phase 1 and 2 Surveys

The satellite map below shows the JTNP and its boundary. Waypoints for golden eagles, their nests and other sensitive species (i.e., peregrine falcons, prairie falcons, bighorn sheep) observed are provided.



= Golden eagle (GE) and their stick nests (GESN)

= Productive golden eagle stick nest

= Other sensitive species, including those identified by cavity nests (CN)
(PR=Prairie Falcon; PE=Peregrine Falcon; BHS=Bighorn Sheep)

Figure 2. Golden Eagles, Nests and Sensitive Species Observed During Phase 1 and 2 Surveys.

Map of Survey Paths from Phase 1 and 2 Surveys

The flight paths taken by WRI for Phase 1 and 2 golden eagle surveys in the JTNP area are depicted below. Areas surveyed during Phase 1 that lacked golden eagle activity were not revisited during Phase 2; in contrast, areas that could not be surveyed during Phase 1 due to concomitant bighorn sheep lambing were surveyed more thoroughly for Phase 2.

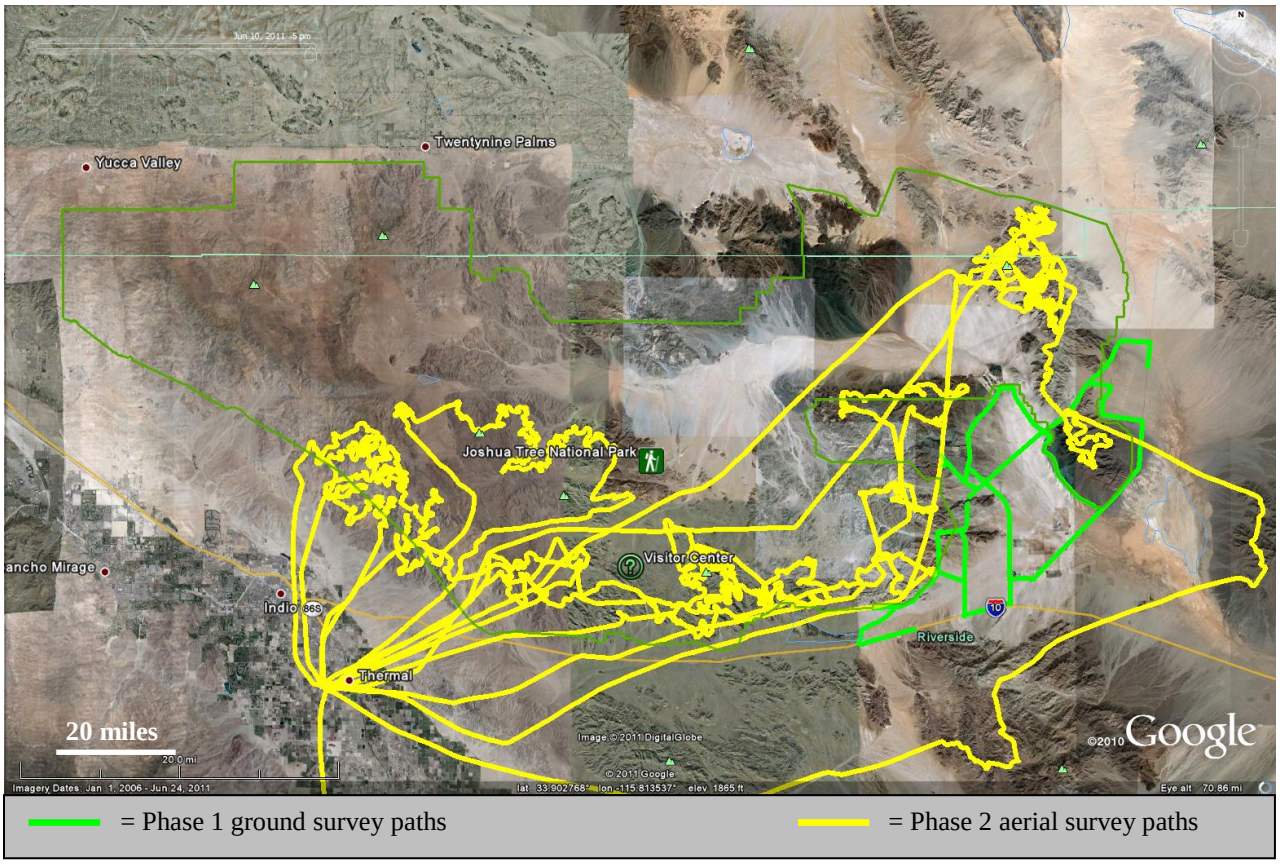


Figure 3. Survey Paths of Phase 1 and 2 JTNP Surveys.

Golden Eagle Nests and Associated Territories from Phase 1 and 2 Surveys

The table below lists the territory number, trip identifier (a unique alpha character applied to each survey conducted by WRI during 2011), a waypoint number for each golden eagle nest identified, the type of nest, the number of golden eagles observed in the nest, the status of nest activity (i.e., active or not during 2011 breeding season), the USGS Quad territory name (incorporating the state, county, and US Geological Survey [USGS] Quad; which is the USFWS recommended naming convention), the geographical area and USGS Quad where the nest was located, and the original waypoint number of nests revisited during phase 2. Productive territories are denoted with green highlighting.

Territory #	Trip ID	Waypoint #	Species	Nest Type	# of Golden Eagle Young	GE Activity for 2011 Season (Yes/No/Possibly)	USGS Quad Territory Name	Geographical Area	USGS Quad	Phase 1 Waypoint # of GESNs Revisited in Phase 2
1	Y	115	GE	SN	0	N	CA-RIV-33115/F4-001-01	Eagle Mountains - ESE	Desert Center	U09
1	Y	110	GE	SN	0	N	CA-RIV-33115/F4-001-02*	Eagle Mountains - ESE	Hayfield Spring	
1	Y	111	GE	SN	0	N	CA-RIV-33115/F4-001-03*	Eagle Mountains - ESE	Hayfield Spring	
2	Y	51	GE	SN	0	N	CA-RIV-33115/F6-001-01	Eagle Mountains - WSW	Cottonwood Spring	
3	Y	76	GE	SN	0	N	CA-RIV-33115/F6-002-01	Eagle Mountains - WSE	Hayfield	
4	Y	81	GE	SN	0	N	CA-RIV-33115/F6-003-01	Eagle Mountains - WC	Hayfield	
4	Y	83	GE	SN	0	N	CA-RIV-33115/F6-003-02	Eagle Mountains - WC	Hayfield	
4	Y	84	GE	SN	1¥	Y	CA-RIV-33115/F6-003-03	Eagle Mountains - WC	Hayfield	
5	Y	203	GE	SN	0	N	CA-RIV-33115/G3-001-01	Coxcomb Mountains -SW	East of Victory Pass	
5	Y	206	GE	SN	0	N	CA-RIV-33115/G3-001-03	Coxcomb Mountains -SW	East of Victory Pass	
5	Y	207a	GE	SN	0	N	CA-RIV-33115/G3-001-04	Coxcomb Mountains -SW	East of Victory Pass	
5	Y	212	GE	SN	0	N	CA-RIV-33115/G3-001-05*	Coxcomb Mountains - SW	Coxcomb Mountains	
6	Y	37	GE	SN	0	N	CA-RIV-33115/G7-001-01	Hexie Mountains - NE	Porcupine Wash	
6	Y	38a	GE	SN	0	N	CA-RIV-33115/G7-001-02	Hexie Mountains - NE	Porcupine Wash	
6	Y	38b	GE	SN	0	N	CA-RIV-33115/G7-001-03	Hexie Mountains - NE	Porcupine Wash	
7	Y	54	GE	SN	0	Y	CA-RIV-33115/G7-002-01	Eagle Mountains - WNW	Porcupine Wash	
7	Y	56	GE	SN	0	Y	CA-RIV-33115/G7-002-02*	Eagle Mountains - WNW	Hayfield	
7	Y	61	GE	SN	2	Y	CA-RIV-33115/G7-002-03*	Eagle Mountains - WNW	Conejo Well	
8	Y	32	GE	SN	0	Y	CA-RIV-33115/G8-001-01	Hexie Mountains - C	Washington Wash	
9	X	117	GE	SN	0	N	CA-RIV-33116/G2-001-01	Little San Bernardino Mountains - E	West Berdoo Canyon	
9	X	119a	GE	SN	0	N	CA-RIV-33116/G2-001-02*	Little San Bernardino Mountains - E	Rockhouse Canyon	
9	X	141	GE	SN	0	Y	CA-RIV-33116/G2-001-03*	Little San Bernardino Mountains - E	Rockhouse Canyon	

CA=California, GE=Golden Eagle, GESN=Golden Eagle Stick Nest, RIV=Riverside County, SN=Stick Nest.
*Based on USFWS recommended naming convention, the territory name 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.
¥This young Golden Eagle was observed as a fledgling flying with one of its parents in the vicinity of the active nest.

Table 1. Golden Eagle Nests and Associated Territories from Phase 1 and 2 Surveys.

Raptors and Other Wildlife Observed During Phase 1 and 2 Surveys

Other wildlife, including raptors and special status species, were documented based on USFWS recommendations and are provided in Table 2 below; 273 *unique* wildlife observations were made during Phase 1 and 2 surveys in the JTNP area.

Species	Cottonwood Mountains	Coxcomb Mountains	Eagle Mountains	Hexie Mountains	Little San Bernardino Mountains	Mecca Hills	Total
Bobcat			1				1
Bighorn Sheep	18	4	15	5	1		43
Barn Owl			3				3
Coyote		1					1
Common Raven	8	6	8	5	6	3	36
Golden Eagle		4	5				9
Great Horned Owl	2	1	9	1	14		27
Peregrine Falcon		3					3
Prairie Falcon		8	8	1	5		22
Red-tailed Hawk	1	9	34	1	8		53
Turkey Vulture		25	48				73
Unidentified *Buteo* sp			2				2
Total	29	61	133	13	34	3	273

Table 2. Raptors and Other Wildlife Observed During Phase 1 and 2 Surveys.

All Data from Phase 1 and 2 Surveys

Map coordinates (i.e., UTM) 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. Golden eagle data are noted in bold type.

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
(5/2/2011) Ground in lieu of aerial - 83-90°F, 0% cloud cover, wind 8-12 decreasing to 0-5mph, 0% precip, 10+ visibility												
U	01	TV		1	11 S 643493 3737079					1010 ft	observed in flight	Eagle Mountains
U	02	RT		1	11 S 642380 3738855					1192 ft	perched on TT	Eagle Mountains
U	04a	TV		1	11 S 640409 3737877					1410 ft	observed in flight	Eagle Mountains
U	04b	RT		1	11 S 640409 3737877					1410 ft	observed in flight	Eagle Mountains
U	05	TV		1	11 S 640614 3737668					1378 ft	observed in flight	Eagle Mountains
U	06	CR		1	11 S 640655 3737520					1357 ft	observed in flight	Eagle Mountains
U	07	UB		2	11 S 640690 3735128					1106 ft	unidentified buteos, possibly 2 RTs courting	Eagle Mountains
U	08	RT	SN	1	11 S 640571 3734840		G	TT	Y	1104 ft	possible older chick sitting next to nest	Eagle Mountains
U	**09**	**GE**	**SN**	**0**		**SE**	**P**	**R**	**N**	**1104 ft**		**Eagle Mountains**
U	10	CR	SN	1	11 S 640473 3734569	N	G	R	Y	1114 ft	flew into nest	Eagle Mountains
U	11	RT		1	11 S 639320 3733072					1356 ft	perched on TT	Eagle Mountains
U	12	RT	SN	1	11 S 639041 3732790		G	TT	Y	1377 ft		Eagle Mountains
U	13	U	SN	0	11 S 638714 3732460			TT		1361 ft		Eagle Mountains
U	14	CR		2	11 S 637559 3731473					1419 ft	observed in flight	Eagle Mountains
U	15	U	SN	0	11 S 636273 3731045			TT		1357 ft		Eagle Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
U	16	RT	SN	1	11 S 636083 3730898		G	TT	Y	1372 ft	possible chick or adult on edge of nest	Eagle Mountains
U	19	RT	SN	4	11 S 635795 3731066		G	TT	Y	1430 ft	adult and three older nestlings	Eagle Mountains
U	20	TV		1	11 S 635095 3731029					1507 ft	observed in flight	Eagle Mountains
U	21	TV		1	11 S 634255 3730957					1568 ft	observed in flight	Eagle Mountains
U	22a	RT	SN	1	11 S 633770 3730913	-	G	TT	Y	1566 ft	adult in nest	Eagle Mountains
U	22b	RT		1	11 S 633770 3730913					1566 ft	perched on TT	Eagle Mountains
U	23	TV		2	11 S 638363 3732026					1397 ft	observed in flight	Eagle Mountains
U	24	RT		1	11 S 639070 3732820					1386 ft	observed in flight	Eagle Mountains
U	25	RT		1	11 S 639354 3733110					1364 ft	observed in flight	Eagle Mountains
U	41	CR	SN	1	11 S 649775 3747853	-	G	TT	Y	839 ft		Coxcomb Mountains
U	42	TV		1	11 S 651149 3749029					979 ft	observed in flight	Coxcomb Mountains
U	43	TV		1	11 S 655850 3742134					621 ft	observed in flight	Coxcomb Mountains
U	44a	TV		1	11 S 657126 3741424					559 ft	observed in flight	Coxcomb Mountains
U	44b	RT		1	11 S 657126 3741424					559 ft	observed in flight	Coxcomb Mountains
U	45	U	SN	0	11 S 652047 3748494	W	F	R		995 ft	GE/RT NE of obs point	Coxcomb Mountains
(6/7/2011) - 2 flights, flight #1 - 93-87°F, 0% cloud cover, 0-5mph wind, 0% precip, 10+ visibility												
X	**117**	**GE**	**SN**	**0**		**N**	**F**	**R**	**N**	**3608 ft**	**rock fall in nest**	**Little San Bernardino Mountains**

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
X	118	BHS		1						3635 ft	ewe observed	Little San Bernardino Mountains
X	**119a**	**GE**	**SN**	**0**		**N**	**G**	**R**	**N**	**3599 ft**		**Little San Bernardino Mountains**
X	119b	PR	CN	4		N	G	R	Y	3599 ft	adult flew from nest with food; three young in nest	Little San Bernardino Mountains
X	121	RT		1	11 S 585542 3743426					3768 ft	juvenile observed in flight	Little San Bernardino Mountains
X	122	GHO		1	11 S 585310 3743520					3622 ft	observed in flight	Little San Bernardino Mountains
X	123	CR		2	11 S 583902 3743193					3471 ft	observed in flight	Little San Bernardino Mountains
X	128	PR		1						2196 ft	perched	Little San Bernardino Mountains
X	131	GHO		1	11 S 580427 3740249					1921 ft		Little San Bernardino Mountains
X	132a	RT	SN	0	11 S 580124 3739975	E	G	R	N	1492 ft	built on this year	Little San Bernardino Mountains
X	132b	RT	SN	0	11 S 580124 3739975	E		R	N	1492 ft	older nest just below X132a	Little San Bernardino Mountains
X	133	CR		1	11 S 583094 3741453					2828 ft		Little San Bernardino Mountains
X	134	GHO		1	11 S 583066 3741438					2819 ft		Little San Bernardino Mountains
X	135	U	SN	0	11 S 583261 3741163	E	P	R	N	2747 ft	old nest	Little San Bernardino Mountains
X	136	CR	SN	0	11 S 583675 3738638	S		R		2250 ft		Little San Bernardino Mountains
flight #2 - 101-91°F, hazy cloud cover, 0-5mph wind, 0% precip, 7-10 visibility												
X	**141**	**GE**	**SN**	**0**		**SW**	**G**	**R**	**Y**	**4786 ft**	**incomplete nest, but new**	**Little San Bernardino Mountains**

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
X	142	RT		1	11 S 585880 3743419					4260 ft	adult observed in flight	Little San Bernardino Mountains
X	143	RT	SN	0	11 S 586653 3740640	S	G	R	Y	3247 ft	white wash	Little San Bernardino Mountains
X	144	GHO		1	11 S 586712 3740380					3161 ft	observed in flight	Little San Bernardino Mountains
X	145	GHO		2	11 S 587760 3739623					2863 ft	adults observed in flight	Little San Bernardino Mountains
X	146	GHO		3	11 S 587860 3740499					3116 ft	juveniles observed in flight	Little San Bernardino Mountains
X	147	RT		1	11 S 588666 3741408					3519 ft	juvenile observed in flight	Little San Bernardino Mountains
X	148	RT	SN	0	11 S 588790 3742319	W	P	R	N	3727 ft		Little San Bernardino Mountains
X	149	RT		3	11 S 588781 3741442					3594 ft	juveniles observed in flight	Little San Bernardino Mountains
X	150	CR		2	11 S 587949 3740549					3255 ft	perched	Little San Bernardino Mountains
X	151	GHO		1	11 S 587951 3740337					3215 ft	observed in flight	Little San Bernardino Mountains
X	152	GHO		1	11 S 587894 3739520					3034 ft	observed in flight	Little San Bernardino Mountains
X	153	GHO		3	11 S 587234 3738255					2507 ft	observed in flight	Little San Bernardino Mountains
X	154	RT		1	11 S 585994 3737242					2111 ft	adult observed in flight	Little San Bernardino Mountains
X	155a	RT	SN	0	11 S 585947 3739368	W	F	R	N	2893 ft		Little San Bernardino Mountains
X	155b	RT	SN	0	11 S 585947 3739368	W	G	R	N	2893 ft	bowl in nest	Little San Bernardino Mountains
X	156	RT	SN	0	11 S 585973 3739314	W	G	R	N	2873 ft		Little San Bernardino Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
X	157	RT		1	11 S 585795 3739286					2971 ft	observed in flight	Little San Bernardino Mountains
X	158a	RT	SN	0	11 S 585158 3733901	S	G	R	N	1603 ft		Cottonwood Mountains
X	158b	RT	SN	0	11 S 585158 3733901	S	G	R	N	1603 ft		Cottonwood Mountains
X	159	RT	SN	0	11 S 586418 3734737	NE	G	R	Y	2349 ft	nice bowl; suspected GESN due to size, but small sticks & lack of yucca may indicate RT	Cottonwood Mountains
X	160	CR		1	11 S 586810 3735085					2649 ft	observed in flight	Cottonwood Mountains
X	161	BHS		2						3060 ft	ewes, (1 young approx 1.5yrs old) observed	Cottonwood Mountains
X	162	BHS		4						3015 ft	3 ewes and 1 yearling observed	Cottonwood Mountains
X	163	RT	SN	0	11 S 590346 3734704	NE	P	R	N	2813 ft	about 200ft to N of taken waypoint	Cottonwood Mountains
X	164	CR		1	11 S 594244 3734439					3442 ft	observed in flight	Cottonwood Mountains
X	165	RT		1	11 S 596572 3734430					3924 ft	observed in flight	Cottonwood Mountains
X	166	CR		1	11 S 603691 3735386					4319 ft	observed in flight	Cottonwood Mountains
(6/9/2011) - 2 flights, flight #1 - 62-87°F, 100-0% cloud cover, 0-3mph, 0% precip, 2-10+ visibility												
Y	7	CR		1	11 S 586269 3736668					2786 ft	observed in flight	Little San Bernardino Mountains
Y	8	CR		1	11 S 592478 3739767					3973 ft	observed in flight	Hexie Mountains
Y	22	BHS		5						3935 ft	Ewes (one may be young ram)	Hexie Mountains
Y	26	U	SN	0	11 S 597386 3745779	SW	P	R	N	3300 ft		Hexie Mountains
Y	27	GHO		1	11 S 595870 3744915					3145 ft	observed in flight	Hexie Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	28	CR	SN	4	11 S 596248 3744940	N	G	R	Y	3098 ft	4 ravens (2 YG)-family, observed perched, and observed in flight	Hexie Mountains
Y	29	RT		1	11 S 597578 3744725					3300 ft	adult observed in flight	Hexie Mountains
Y	30	CR	SN	0	11 S 599850 3745134	W	G	R	N	3269 ft		Hexie Mountains
Y	31	U	SN	0	11 S 600440 3745776	NW	F	R	N	3455 ft		Hexie Mountains
Y	**32**	**GE**	**SN**	**0**		**W**	**G**	**R**	**Y**	**3292 ft**	**some white wash, no sign of producing young**	**Hexie Mountains**
Y	**37**	**GE**	**SN**	**0**		**NW**	**P**	**R**	**N**	**3377 ft**	**single nest near Y38**	**Hexie Mountains**
Y	**38a**	**GE**	**SN**	**0**		**NW**	**F**	**R**	**N**	**3489 ft**		**Hexie Mountains**
Y	**38b**	**GE**	**SN**	**0**		**NW**	**P**	**R**	**N**	**3489 ft**		**Hexie Mountains**
Y	39	PR		1						3795 ft	observed in flight	Hexie Mountains
Y	45	CR	SN	1	11 S 586968 3729376		G	TT	Y	1528 ft		Mecca Hills
flight #2 - 100-96°F, 0% to light haze cloud cover, 0-5mph, 0% precip, 5-10+ visibility												
Y	46	RT	SN	0	11 S 596455 3734565	W	G	R	N	3600 ft		Cottonwood Mountains
Y	47	BHS		2						3876 ft		Cottonwood Mountains
Y	48	BHS		1						4297 ft		Cottonwood Mountains
Y	49	CR	SN	0	11 S 603702 3735312	S	G	R	N	4098 ft		Cottonwood Mountains
Y	50	BHS		4						3275 ft	2 lambs and 2 ewes	Cottonwood Mountains
Y	**51**	**GE**	**SN**	**0**		**NE**	**P**	**R**	**N**	**4036 ft**		**Eagle Mountains**
Y	52	RT		1	11 S 614616 3734935					4190 ft	adult observed in flight	Eagle Mountains
Y	53	CR		1	11 S 612604 3738672					3510 ft	observed in flight	Eagle Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	**54**	**GE**	**SN**	**0**		**NW**	**G**	**R**	**Y**	**4634 ft**	**very large, on 2 levels**	**Eagle Mountains**
Y	55	U	SN	0	11 S 615543 3735710	NW	F	R	N	4633 ft	beginings of nest	Eagle Mountains
Y	**56**	**GE**	**SN**	**0**		**N**	**G**	**R**	**Y**	**4351 ft**		**Eagle Mountains**
Y	57	TV		1	11 S 618353 3732618					4406 ft	observed in flight	Eagle Mountains
Y	58	CR		1	11 S 619888 3732994					4030 ft	observed in flight	Eagle Mountains
Y	59	GHO		1	11 S 619514 3734208					4067 ft	observed in flight	Eagle Mountains
Y	60	BHS		9						4033 ft	ewes	Eagle Mountains
Y	**61**	**GE**	**SN**	**3**		**N**	**G**	**R**	**Y**	**4293 ft**	**adult observed flying nearby; 2 chicks in nest, ~8 weeks old**	**Eagle Mountains**
Y	62	PR		1						3457 ft	observed in flight	Eagle Mountains
Y	63a	PR		1		NW	G	R	Y	3453 ft	observed in flight	Eagle Mountains
Y	63b	PR	CN	0		NW	G	R	Y	3453 ft	3-4 CN in this area	Eagle Mountains
Y	64	CR	SN	0	11 S 625869 3735275	N	G	R	Y	3431 ft		Eagle Mountains
Y	65	TV		4	11 S 627215 3735935					3504 ft	observed in flight	Eagle Mountains
Y	67	TV		1	11 S 627731 3734581					3369 ft	observed in flight	Eagle Mountains
Y	68	RT	SN	0	11 S 626653 3733685	S	G	R	Y	3646 ft		Eagle Mountains
Y	69	RT		1	11 S 626489 3733753					3824 ft	juvenile observed perched, and observed in flight	Eagle Mountains
Y	70	RT		1	11 S 628922 3732595					2773 ft	observed in flight	Eagle Mountains
Y	71a	RT	SN	0	11 S 629141 3732053	N	G	R	N	2287 ft		Eagle Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	71b	RT	SN	2	11 S 629141 3732053	N	G	R	Y	2287 ft		Eagle Mountains
Y	72	RT	SN	0	11 S 627782 3731591	E	G	R	Y	2434 ft	nice bowl	Eagle Mountains
Y	73	TV		0	11 S 626978 3731237					2809 ft	roost	Eagle Mountains
Y	74	RT		2	11 S 626241 3731434					2874 ft	juvenile observed in flight	Eagle Mountains
Y	75	GHO		1	11 S 625941 3730986					2636 ft	observed in flight	Eagle Mountains
Y	**76**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**3336 ft**	**rocks in nest**	**Eagle Mountains**
Y	77	TV		1	11 S 623814 3732707					3291 ft	observed in flight	Eagle Mountains
Y	78	RT	SN	0	11 S 622220 3731250	NE	G	R	N	3212 ft		Eagle Mountains
Y	79	RT		2	11 S 622201 3731330					3225 ft	juvenile observed in flight	Eagle Mountains
Y	**80**	**GE**		**2**						**3146 ft**	**adult and recently fledged juvenile, both observed in flight; juvenile all black**	**Eagle Mountains**
Y	**81**	**GE**	**SN**	**0**		**N**	**P**	**R**	**N**	**3110 ft**		**Eagle Mountains**
Y	82	PR		2						3394 ft	observed in flight	Eagle Mountains
Y	**83**	**GE**	**SN**	**0**		**NE**	**F**	**R**	**N**	**3489 ft**		**Eagle Mountains**
Y	**84**	**GE**	**SN**	**0**		**N**	**G**	**R**	**Y**	**3113 ft**	**huge nest**	**Eagle Mountains**
Y	85	TV		1	11 S 618752 3732440					3815 ft	observed in flight	Eagle Mountains
Y	86	TV		1	11 S 619195 3731544					3717 ft	observed in flight	Eagle Mountains
Y	87	TV		7	11 S 617375 3731635					3699 ft	observed in flight	Eagle Mountains
Y	88	GHO		1	11 S 616452 3730845					3202 ft	observed in flight	Eagle Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	89	BNOW		1	11 S 616255 3730815					3146 ft	observed perched, and observed in flight	Eagle Mountains
Y	90	RT	SN	1	11 S 616344 3730832	NW	G	R	N	3050 ft		Eagle Mountains
Y	91	TV		1	11 S 616837 3730482					3320 ft	observed in flight	Eagle Mountains
Y	92	RT		1	11 S 613063 3730109					3397 ft	observed perched	Eagle Mountains
Y	93	GHO		1	11 S 607898 3730048					2540 ft	observed in flight	Cottonwood Mountains
Y	94	CR		2	11 S 592472 3726376					2092 ft	observed in flight	Mecca Hills
(6/10/2011) - 3 flights, flight #1 - 70-87°F, 0%-light haze cloud cover, 0-12mph wind, 0% precip, 5-7 visibility												
Y	96	GHO		1	11 S 595983 3733394					3297 ft	observed in flight	Cottonwood Mountains
Y	97	CR	SN	2	11 S 597660 3734137	SW	G	R	Y	3801 ft	2 young in nest	Cottonwood Mountains
Y	98	BHS		5						3966 ft	ewes	Cottonwood Mountains
Y	99	CR		1	11 S 603157 3732001					4026 ft	adult observed in flight	Cottonwood Mountains
Y	100	CR		1	11 S 605774 3731099					3668 ft	observed in flight	Cottonwood Mountains
Y	101	CR		1	11 S 609326 3731215					3503 ft	observed in flight	Cottonwood Mountains
Y	102	RT	SN	0	11 S 611203 3731089	SW	G	R	Y	3145 ft	white wash	Eagle Mountains
Y	103	U	SN	0	11 S 613453 3729627	W	F	R	N	2861 ft		Eagle Mountains
Y	104	TV		1	11 S 614096 3729376					3010 ft	observed in flight	Eagle Mountains
Y	105	RT	SN	0	11 S 614348 3729043	SE	G	R	N	2933 ft		Eagle Mountains
Y	106	GHO		1	11 S 616671 3728911					2863 ft	observed in flight	Eagle Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	107	RT		1	11 S 619342 3730104					2885 ft	adult observed in flight	Eagle Mountains
Y	108	BNOW		2	11 S 632137 3733409					2634 ft	observed in flight	Eagle Mountains
Y	109	TV		4	11 S 636124 3734728					3219 ft	adult observed in flight	Eagle Mountains
Y	**110**	**GE**	**SN**	**0**		**N**	**F**	**R**	**N**	**2445 ft**		**Eagle Mountains**
Y	**111**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**2731 ft**		**Eagle Mountains**
Y	112	RT		1	11 S 636185 3733876					2850 ft	adult observed in flight	Eagle Mountains
Y	113	RT		1	11 S 635923 3732990					2751 ft	adult observed in flight	Eagle Mountains
Y	114	RT	SN	0	11 S 636129 3732497	NE	G	R	Y	2387 ft		Eagle Mountains
Y	**115**	**GE**	**SN**	**0**		**E**	**F**	**R**	**N**	**1793 ft**	**Same nest as Phase 1 U09**	**Eagle Mountains**
Y	116	RT		1	11 S 640147 3734655					1771 ft	adult observed in flight	Eagle Mountains
Y	117	TV		1	11 S 638321 3735391					2575 ft	adult observed in flight	Eagle Mountains
Y	118	TV		0	11 S 638175 3735453					2681 ft	Roost	Eagle Mountains
Y	119	TV		4	11 S 636991 3736119					3016 ft	adult observed in flight	Eagle Mountains
Y	120	TV		1	11 S 632955 3742437					3557 ft	adult observed in flight	Eagle Mountains
Y	121	RT	SN	0	11 S 632910 3742477	S	G	R	Y	3444 ft	nice bowl; new, yucca	Eagle Mountains
Y	122	BC		1	11 S 634568 3742917					3534 ft		Eagle Mountains
Y	123	RT	SN	0	11 S 635039 3743228	NW	G	R	N	2929 ft		Eagle Mountains
Y	124	RT		1	11 S 635500 3743313					3115 ft	adult observed in flight	Eagle Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	125	RT	SN	0	11 S 636020 3743765	N	G	R	Y	2795 ft		Eagle Mountains
Y	126	RT	SN	0	11 S 636234 3742802	SE	G	R	Y	2610 ft		Eagle Mountains
Y	127	GHO		2	11 S 635736 3742105					2780 ft	adult and young, both observed in flight	Eagle Mountains
Y	128	RT	SN	0	11 S 636243 3741939	NE	P	R	N	2919 ft		Eagle Mountains
Y	129	RT	SN	0	11 S 636455 3741929	NE	G	R	Y	2770 ft		Eagle Mountains
Y	130	TV		1	11 S 636759 3741860					2800 ft	FL	Eagle Mountains
Y	131	RT		1	11 S 636905 3741799					2785 ft	adult observed in flight	Eagle Mountains
Y	133a	RT	SN	0	11 S 637742 3741453	NE	G	R	N	2521 ft	RT	Eagle Mountains
Y	133b	GHO		1	11 S 637742 3741453					2521 ft	observed in flight	Eagle Mountains
Y	134	RT	SN	0	11 S 637987 3741391	E	F	R	N	2468 ft		Eagle Mountains
Y	135	RT		1	11 S 638584 3741229					2403 ft	adult observed in flight	Eagle Mountains
Y	136	RT	SN	0	11 S 639910 3740923	NE	G	R	N	1793 ft	big sticks and yucca, but small nest	Eagle Mountains
Y	137	CR	SN	0	11 S 640003 3740885	NE	G	R	N	1849 ft	big sticks, but small nesT	Eagle Mountains
Y	**138**	**GE**	**SN**	**0**		**W**	**F**	**R**	**N**	**1909 ft**		**Eagle Mountains**
Y	139	RT	SN	0	11 S 630677 3752347	SE		R		1785 ft		Eagle Mountains
Y	140	U	CN	0	11 S 630591 3752797				N	1866 ft	unknown falcon nest; indeterminable on photo	Eagle Mountains
Y	141	TV		1	11 S 630713 3751682					2107 ft	observed in flight	Eagle Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	142	BHS		6						2423 ft	ewes and some young	Eagle Mountains
Y	**143**	**GE**	**SN**	**0**		**N**	**G**	**R**	**N**	**1979 ft**		Eagle Mountains
Y	**144**	**GE**	**SN**	**0**		**W**	**G**	**R**	**N**	**2016 ft**		Eagle Mountains
Y	**145**	**GE**	**SN**	**0**		**SW**	**G**	**R**	**N**	**2005 ft**		Eagle Mountains
Y	146	RT	SN	0	11 S 630821 3751921	W	G	R		2074 ft		Eagle Mountains
Y	**147**	**GE**	**SN**	**0**		**NW**	**P**	**R**	**N**	**2146 ft**		Eagle Mountains
Y	148	CR	SN	0	11 S 632813 3752098	NW	G	R	Y	2224 ft		Eagle Mountains
Y	149	TV		1	11 S 633065 3752453					2360 ft	observed in flight	Eagle Mountains
Y	150	RT		2	11 S 634499 3752673					2264 ft	observed in flight	Eagle Mountains
Y	151	PR		4						2610 ft	1-2 adults, with fledglings, observed in flight	Eagle Mountains
Y	153	TV		1	11 S 637964 3753546					2181 ft	observed in flight	Eagle Mountains
Y	154	GHO		1	11 S 638252 3753255					2237 ft	observed in flight	Eagle Mountains
Y	155	RT	SN	0	11 S 638543 3753308	SW		R	N	1957 ft		Eagle Mountains
Y	156	GHO		1	11 S 638373 3753507					1921 ft	observed in flight	Eagle Mountains
Y	157	RT	SN	0	11 S 640621 3753063	NE	G	R	Y	1888 ft		Eagle Mountains
Y	158	TV		1	11 S 642574 3753661					2290 ft	observed in flight	Eagle Mountains
Y	159	CR		2	11 S 634457 3737228					3026 ft	observed in flight	Eagle Mountains
Y	160	TV		7	11 S 632940 3733241					2757 ft	observed in flight	Eagle Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	161	TV		1	11 S 627588 3731222					2664 ft	observed in flight	Eagle Mountains
flight #2 - 95-100°F, light haze cloud cover, 0-7mph wind, 0% precip, 5-10 visibility												
Y	165	PE		2						2718 ft	observed in flight	Coxcomb Mountains
Y	166	BHS		2						2990 ft		Coxcomb Mountains
Y	167	RT		1	11 S 645025 3765926					3224 ft	observed in flight	Coxcomb Mountains
Y	168	BHS		2						3871 ft	ewes	Coxcomb Mountains
Y	169	CR		2	11 S 647331 3767411					4212 ft	observed in flight	Coxcomb Mountains
Y	170	TV		1	11 S 649163 3770695					2865 ft	observed in flight	Coxcomb Mountains
Y	171	PR		1						2619 ft	observed in flight	Coxcomb Mountains
Y	172	U	SN	0	11 S 650515 3771237	W	G	R	N	2451 ft	nice bowl	Coxcomb Mountains
Y	173	GHO		1	11 S 651145 3770858					2636 ft	observed in flight	Coxcomb Mountains
Y	**174**	**GE**	**SN**	**0**		**N**	**G**	**R**	**N**	**3083 ft**	**active in 2010**	**Coxcomb Mountains**
Y	175	PE		1						3393 ft	observed in flight	Coxcomb Mountains
Y	176	TV		1	11 S 649932 3767313					3276 ft	observed in flight	Coxcomb Mountains
Y	**177**	**GE**		**1**						**2795 ft**	**observed in flight, possibly 2- 2nd sighting may not have been same bird**	**Coxcomb Mountains**
Y	178	RT		2	11 S 651228 3767977					2690 ft	observed in flight	Coxcomb Mountains
Y	179	U	SN	0	11 S 651287 3766770	N	F	R	N	3218 ft	remnants of nest	Coxcomb Mountains
Y	180a	RT		1	11 S 650275 3764338					3537 ft	observed in flight	Coxcomb Mountains
Y	180b	U	SN	0	11 S 650275 3764338	N	F	R		3847 ft		Coxcomb Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	**181**	**GE**	**SN**	**0**		**SE**	**G**	**R**	**Y**		**white wash, probably produced young in 2011**	**Coxcomb Mountains**
Y	182	TV		2	11 S 647011 3766186					4280 ft	observed in flight	Coxcomb Mountains
Y	183	U	SN	0	11 S 652036 3762318		G	R	Y	3930 ft	probably RT, white wash	Coxcomb Mountains
Y	185a	RT		1	11 S 652192 3760058					3121 ft	observed in flight	Coxcomb Mountains
Y	185b	TV		1	11 S 652192 3760058					3121 ft	observed in flight	Coxcomb Mountains
Y	186	TV		1	11 S 652805 3762829					3323 ft	observed in flight	Coxcomb Mountains
Y	**187**	**GE**	**SN**	**0**		**E**	**G**	**R**	**Y**	**2974 ft**	**white wash; nest from last year**	**Coxcomb Mountains**
Y	**188**	**GE**		**1**						**3750 ft**	**adult observed in flight, possibly 2 adults, 2nd sighting may/may not be same bird**	**Coxcomb Mountains**
Y	**189**	**GE**	**SN**	**0**		**NW**	**F**	**R**	**N**	**3771 ft**		**Coxcomb Mountains**
Y	**190**	**GE**	**SN**	**0**		**E**	**G**	**R**	**Y**	**3903 ft**	**white wash; duplicate of Y181**	**Coxcomb Mountains**
Y	191	TV		1	11 S 646707 3767579					4086 ft	observed in flight	Coxcomb Mountains
flight #3 - 100°F, 0% cloud cover, 0-5mph wind, 0% precip, 10+ visibility												
Y	192	PR		1						3633 ft	observed in flight	Coxcomb Mountains
Y	**193**	**GE**	**SN**	**0**		**NE**	**G**	**R**	**N**	**2862 ft**		**Coxcomb Mountains**
Y	**194**	**GE**		**1**						**3109 ft**	**adult observed in flight**	**Coxcomb Mountains**
Y	195	COYO		1	11 S 652143 3770390					1703 ft		Coxcomb Mountains
Y	**196**	**GE**		**1**						**2733 ft**	**adult observed in flight**	**Coxcomb Mountains**
Y	**197**	**GE**	**SN**	**0**		**NW**	**P**	**R**	**N**	**2537 ft**		**Coxcomb Mountains**

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
Y	**198**	**GE**	**SN**	**0**		**SW**	**P**	**R**	**N**	**3508 ft**		**Coxcomb Mountains**
Y	199	CR		2	11 S 651605 3761626					3441 ft	observed in flight	Coxcomb Mountains
Y	200	TV		1	11 S 651246 3753653					2694 ft	observed in flight	Coxcomb Mountains
Y	201	CR		1	11 S 652140 3752276					2550 ft	observed in flight	Coxcomb Mountains
Y	202	TV		2	11 S 653634 3749489					2458 ft	observed in flight	Coxcomb Mountains
Y	**203**	**GE**	**SN**	**0**		**NW**	**G**	**R**	**N**	**2669 ft**		**Coxcomb Mountains**
Y	204	TV		4	11 S 655207 3747312					2675 ft	observed in flight	Coxcomb Mountains
Y	205	PR		1	11 S 655808 3746233					2331 ft	observed in flight	Coxcomb Mountains
Y	**206**	**GE**	**SN**	**0**		**NE**	**F**	**R**	**N**	**2339 ft**		**Coxcomb Mountains**
Y	**207a**	**GE**	**SN**	**0**		**NE**	**G**	**R**	**N**	**2304 ft**		**Coxcomb Mountains**
Y	207b	PR		1						2304 ft	observed in flight	Coxcomb Mountains
Y	208	TV		2	11 S 656765 3747777					2544 ft	observed in flight	Coxcomb Mountains
Y	209	PR		4						1871 ft	observed in flight	Coxcomb Mountains
Y	210	RT		1	11 S 656432 3748746					2187 ft	observed in flight	Coxcomb Mountains
Y	211	RT		1	11 S 654532 3750574					2202 ft	juvenile observed in flight	Coxcomb Mountains
Y	**212**	**GE**	**SN**	**0**		**SE**	**F**	**R**	**N**	**2106 ft**	**old but not yet deteriorating**	**Coxcomb Mountains**
Y	213	RT		1	11 S 663613 3747255					1449 ft	observed in flight	Coxcomb Mountains

BC=Bobcat, BHS=Bighorn Sheep, BNOW=Barn Owl, CN=Cavity Nest, COYO=Coyote, CR=Common Raven, F=Fair, G=Good, GE=Golden Eagle, GHO=Great Horned Owl, P=Poor, PE=Peregrine Falcon, PR=Prairie Falcon, R=Rock, RT=Red-tailed Hawk, SN=Stick Nest, TT=Transmission Tower, TV=Turkey Vulture, U=Unidentified, UB=Unidentified *Buteo* species, XX=Other.
*If no nest type is indicated, then the species was observed independently of a nest (e.g., flying, perched, etc.).

Table 3. All Data from Phase 1 and 2 Surveys of JTNP.

Photographs of Golden Eagle Nests and Other Observations

A great horned owl (Y27GHO-1) observed flying June 9th in the Hexie Mountains (Phase 2).

An active golden eagle stick nest (Y32GESN-0) in good condition with fresh greenery observed June 9th in the Hexie Mountains (Phase 2).

A very large, active golden eagle stick nest (Y54GESN-0) in good condition with fresh yucca and greenery added recently to the nest; observed June 9th in the Hexie Mountains (Phase 2).

An active golden eagle stick nest (Y56GESN-0) in good condition with new sticks recently added, observed June 9th in the Eagle Mountains (Phase 2).

Inactive golden eagle stick nest (X119aGESN-0) in good condition observed to the upper left of a prairie falcon cavity nest (X119bPRCN-4) with 3 young; one of the adult falcons was flying nearby with food. Observed June 7th in the Little San Bernardino Mountains (Phase2).

An active but incomplete golden eagle stick nest (X141GESN-0) in good condition observed June 7th in the Little San Bernardino Mountains; fresh greenery, yucca and a small bowl can be seen (Phase 2).

An active golden eagle stick nest (Y61GESN-2) tucked far under a ledge. It contained 2 large young approximately 8 weeks old; one of the adults was observed flying nearby. Observed June 9th in the Eagle Mountains (Phase 2).

A zoomed-in view of the Eagle Mountains nest pictured above. The 2 golden eagle chicks and a desert cottontail (prey) can be easily seen at this magnification (Phase 2).

An adult golden eagle (Y80GE-2) observed June 9th flying with its young, pictured below, in the Eagle Mountains (Phase 2).

A juvenile golden eagle (Y80GE-2) that recently fledged and was observed June 9th flying with one of its parents, pictured above. Interestingly, this juvenile was solid black and did not exhibit the usual white "windows" in the wings or white tail band (Phase 2).

A large, active golden eagle stick nest (Y84GESN-0) in good condition with fresh yucca recently added; observed June 9th in the Eagle Mountains (Phase 2).

A desert fan palm oasis in the Indio Hills; these are rare ecological communities found only in the Colorado Desert (Phase 2) (CDFG 2011).

DISCUSSION OF FINDINGS

WRI conducted Phase 1 and 2 surveys for the 2011 golden eagle breeding season that encompassed a portion of the JTNP in Riverside County, California.

Twenty-two golden eagle nests, comprising 9 territories, were documented; 4 were documented to be active for the 2011 breeding season (Eagle Mountains – West Central, Eagle Mountains – West Northwest, Hexie Mountains - Central, Little San Bernardino Mountains – East), 2 of which (Eagle Mountains - West Central, Eagle Mountains – West Northwest) produced a total of at least 3 young. The remaining 5 territories were documented as inactive for the2011 breeding season.

Because aerial surveys could not be conducted in the Cottonwood and Eagle mountain ranges for Phase 1 due to concomitant bighorn sheep lambing season, the actual golden eagle occupancy for this area is likely to be underestimated because breeding attempts that failed early in the breeding season would not have been observed or documented. Additionally, this constraint and the delayed JTNP permit resulted in Phase 2 surveys, with a USFWS recommended lag time of at least 30 days post Phase 1, being conducted at a later time than desired. The actual number of productive territories and/or number of young produced is therefore also likely to be underestimated because fledging, which often occurs between May and June in Southern California, may have already occurred. An examples of this latter issue was demonstrated by the young golden eagle observed June 9th that had already fledged in the Eagle Mountain - West Central territory (Y80GE-2).

Additionally during Phase 1 and 2 surveys, 9 golden eagles, 3 barn owls, 43 bighorn sheep, 1 bobcat, 36 common ravens, 1 coyote, 27 great horned owls, 3 peregrine falcons, 22 prairie falcons, 53 red-tailed hawks, 73 turkey vultures and 2 unidentified *Buteo* species were observed totaling 273 unique wildlife documentations. All golden eagle nests and territories have been assigned a USGS Quad name, and all sightings have been documented with GPS locations and recorded, as recommended by the USFWS (Pagel et al. 2010, Gould and Schmidt 2011).

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Pagel J.E., D.M. Whittington and G.T. Allen. 2010. Interim Golden Eagle technical guidance: Inventory and monitoring protocols; and other recommendations in support of golden Eagle management and permit issuance. Division of Migratory Bird Management, U.S. Fish and Wildlife Service.

APPENDIX A
Wildlife Research Institute Golden Eagle Team

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

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 but he has also studied and banded 3700 Great Blue Herons, conducted mammal research, and trapped and tagged over 3,000 mammals of various species. Dave currently 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 began helicopter surveys on raptors in the Mojave in 1968, in Korea in 1969, and in Ohio in the 1970's. 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 starting in 1867. Dave's involvement began in 1968 in the Western Mojave but now includes all of Southern California and Nevada. 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 Dept. 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 530 golden eagles, over 150 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 The 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 two universities and one technical college.

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 and ground 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 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 l982 to l988, 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.

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, nest observations, 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 also helps coordinate office operations to support WRI's field activities.

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 started conducting helicopter surveys on golden eagles and other raptors in 2008, including over 250 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 as the project manager for various projects pertaining to the golden eagle. These include observation, 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 (black footed ferret) to sensitive fish, black-tailed prairie dog 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.

James Hannan, Ph.D.
Senior Wildlife Biologist

Dr. Hannan has experience with WRI conducting helicopter surveys of golden eagles and other raptors since 2002. Jim also helps on WRI's long running golden eagle Research project with nest observation, rappelling to, banding and tracking golden eagles since 2000. Jim, started golden eagle migration counts and banding in Montana in 2001. 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 Crops 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).

Daniel Palmer
Wildlife Biologist

Daniel received his Bachelor of Science in Biology from San Diego State in 2002 and has conducted graduate studies since that time. He is an experienced biologist, who has worked on a number of projects throughout Southern California for WRI and the USGS. WRI projects included surveys and monitoring for burrowing owls on private land and March Air Reserve Base, and golden eagle ground and aerial surveys on private property, State Park property, and US Forest Service land. Daniel has trapped for burrowing owls in order to assist with banding and relocation, and he has trapped for golden eagles in order to assist with banding, tagging, and satellite transmitter placement. He has also assisted with several banding trips, which included banding, tagging, and the placement of satellite transmitters on several golden eagle nestlings. During his work with WRI during 2011, Daniel logged well over 320 hours of survey time with golden eagles, as well as over 300 hours of monitoring and observation time for golden eagles and 23 other species of raptors. Before WRI, Daniel had worked for the USGS surveying for bats and Arroyo toads (*Anaxyrus californicus*) on US National Forest Service land, California State Park

land, California Fish and Game reserves, Bureau of Land Management property, and on Marine Corps Base Camp Pendleton. Daniel decided to switch his focus back to raptors before becoming part of the WRI team. He has been a raptor biologist and observer for most of his biology career, and some of his recorded raptor data dates back to 1999.

Katie Quint
Wildlife Biologist
Ms. Quint received her Bachelor of Science in Zoology with a minor in Psychology from North Carolina State University in 2010. Part of her academic experience involved keeping and training 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 in addition to providing animal care. Ms. Quint has one year of Golden Eagle experience including aerial and ground surveys in California and Nevada. She has participated in Golden Eagle and Burrowing Owl banding events as well as Burrowing Owl monitoring projects for WRI.

Renée Rivard, Pharm.D.
Wildlife Biologist
Dr. Rivard is currently a member of the Wildlife Research Institute's Golden Eagle team; she has accumulated over 225 hours of extensive aerial transect surveys while participating in more than 18 golden eagle projects conducted by WRI for numerous renewable energy projects across desert and mountain habitat in the California Mojave desert, San Diego and adjacent counties, and Nevada. Additionally, she has spent over 150 hours conducting ground observations while participating in WRI's ongoing golden eagle research and monitoring project in San Diego County and Montana as a member of the banding, repelling, telemetry, and trapping 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 5 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).

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-transmittering 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).

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
Pilot, 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.
Pilot, Cherry Helicopters
Dr. Matson is a practicing physician who also started and headed a helicopter company in Hawaii to provide industrial and tourist services. Cherry Helicopters uses Hughes-500 helicopters to conduct these surveys. Gregg, WRI, and Cherry Helicopters 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
Pilot, 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.

APPENDIX B
2011 Joshua Tree National Park Permit

SCIENTIFIC RESEARCH AND COLLECTING PERMIT

Grants permission in accordance with the attached general and special conditions

United States Department of the Interior
National Park Service

Joshua Tree NP

Study#: JOTR-00157
Permit#: JOTR-2011-SCI-0030
Start Date: Jun 06, 2011
Expiration Date: Jun 30, 2011
Coop Agreement#: n/a
Optional Park Code: JOTR

Name of principal investigator:

Name: Dave Bittner **Phone:** 7607893992 **Email:** WildlifeResearchInstitute@gmail.com

Name of institution represented:

Wildlife Research Institute

Co-Investigators:

Name: Chris Meador	**Phone:** 7607893992	**Email:** cmeador@wildlife-research.org
Name: Rene Revard	**Phone:** 760-789-3992	**Email:** rrevard@wildlife-research.org

Project title:

Golden Eagle Surveys

Purpose of study:

To determine potential conflicts with wildlife productivity and surviability that might result from proposed solar projects located adjacent to the southern and eastern edges of but just outside the park. In addition a large linear transmission line is proposed just south of the park and also requires surveys for raptors and in particular Golden Eagles. The survey, per USFWS protocol,is a ten mile radius around the project area. The area of the park to be surveyed by helicopter is the Coxcombs and Eagle mountains and the southern edge of the park facing the I-10 corridor.

Subject/Discipline:

Birds / Ornithology

Locations authorized:

All suitable Golden Eagle habitat within a 10 miles radius from proposed solar site. Helicopter survey is proposed to occur in south-east portion of park, including Eagle Mountains and Coxcomb Mountains.

Transportation method to research site(s):

Helicopter flight survey on a single day only. The helicopter is a Hughes 500, a small and manuerable helicopter that we use for wildlife surveys. We will fuel and access from outside the park and will only be airborne above the park.

Collection of the following specimens or materials, quantities, and any limitations on collecting:

1) Permittee will strictly adhere to the USFWS (Feb 2010) guidelines on "Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendation". Avoid any disturbance to nesting raptors. Keep the maximum distance (approach only as close as needed to identify) from nesting raptors possible when collecting data. Park values the data collected as part of this effort but, is concerned that data may be collected in a way that disturbs a nesting raptor population that is spatially remote and relatively free of human disturbance. Helicopter blade "wash" should not disturb raptors. USFWS protocol states that any disturbance to raptors is considered "take" and should be avoided at all costs.

2) Prior to and throughout project's study, permittee should coordinate with the Park's Wildlife Ecologist regarding sensitive wildlife habitat and concerns. Prior to aerial surveys in the Park, permittee will submit and follow the flight plan as discussed with Wildlife Ecologist and all NEPA and NHPA compliance must be completed. Permittee must provide a preliminary verbal report of his findings by no later than Wed, June 8, 2011 (weather permitting) or within 24 hours of post-aerial eagle surveys.

Permit:JOTR-2011-SCI-0030 - Page 1 of 6

3) Recommend that surveying for eagles occur no less than 500 feet above ground level and checking for eagle nests & activity should be kept as short as possible. If bighorn sheep activity is noted, then fly back to a higher elevation to minimize impacts. Request that an ornithologist and a bighorn sheep biologist be present to provide flight guidance to minimize impacts to both taxa (e.g. avoid harrassing animals).

Name of repository for specimens or sample materials if applicable:

n/a

Specific conditions or restrictions (also see attached conditions):

Park Conditions - Joshua Tree NP

Joshua Tree National Park Research Conditions & Restrictions

- Permittee will strictly adhere to the USFWS (Feb 2010) guidelines on "Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendation". Avoid any disturbance to nesting raptors. Keep the maximum distance (approach only as close as needed to identify) from nesting raptors possible when collecting data. Park values the data collected as part of this effort but, is concerned that data may be collected in a way that disturbs a nesting raptor population that is spatially remote and relatively free of human disturbance. Helicopter blade "wash" should not disturb raptors. USFWS protocol states that any disturbance to raptors is considered "take" and should be avoided at all costs.

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- Recommend that surveying for eagles occur no less than 500 feet above ground level and checking for eagle nests & activity should be kept as short as possible. If bighorn sheep activity is noted, then fly back to a higher elevation to minimize impacts. Request that an ornithologist and a bighorn sheep biologist be present to provide flight guidance to minimize impacts to both taxa (e.g. avoid harrassing animals).

- When annual IAR(s) and final report are submitted to the Park, permittee must provide copies of all field records (e.g. field notes, data collected, results of scientific analyses, maps w/ GPS coordinates, photos, reports, etc...) on archival or acid-free quality paper to the Park Research Coordinator.

- Permits must be carried at all times by all individuals covered under the permit while conducting research in the park.

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1. This permit, issued by the National Park Service (hereafter referred to as NPS), allows the named principal investigator to collect certain animal, plant, or mineral resources in the locations and quantities specified. Archeological and paleontological materials may not be collected or disturbed under this permit unless accompanied by a current Antiquities Permit.

2. Field assistants may collect only under the direct supervision of the principal investigator named on the permit. The permit holder is responsible for seeing that each assistant understands the permit stipulations. Assistants collecting independently must be issued their own collecting permits.

3. This permit does not give the bearer license to violate any NPS regulations.

4. A pre-field work meeting may be required between the principal investigator(s) and NPS staff to clarify and reinforce permit conditions, access, research/collecting methods, reporting, communications and other items related to this permit

and the research proposal.

5. Before initiating field research please contact the park Research Coordinator at (760)367-5579. Identify yourself by name, organization, or agency, and describe where you will be working, and vehicle(s) being used.

6. If designated parking areas are not convenient, park in a safe place with plenty of sight distance for other traffic that does not cause any damage to the resources.

7. Place a copy of the enclosed Research and/or Collecting Permit in the driver side window of your parked vehicle.

8. If access is required inside administratively closed areas, make advance arrangements, ensure that your permit notes these access issues, and advise the local federal dispatch center (1-909-383-5652) before going into those closed park areas. Ask for the park service dispatcher and inform them of your permitted activity, permit number and time in and out of the area.

10. All collecting (if permitted) must be done away from roads, trails, and developments, unless otherwise specified in the permit. Collection methods shall not attract attention or cause unapproved damage to the environment. If visitors inquire about your collecting, please provide information to them in a courteous and informative manner. This information should reflect â that collecting without a permit carries stiff penalties and that collection permits are available only for a reputable scientific or educational institution or a State or Federal agencyâ .

11. Collected specimens will remain Federal property unless and until ownership is conveyed.

12. The Research Coordinator does require locality records (UTMs) for all plots, survey areas, research vicinities, excavations, transects or any other georeferenceable aspects of activities noted in this permit. The Research Coordinator may also require an inventory and locality record (UTMs) for any or all specimens before they are removed and, after the collection has been assembled, to submit it for examination. An electronic metadata form to be used for this purpose is available through the Research Coordinator. Applicability of this requirement to your research activity should be discussed with the park Research Coordinator prior to any activities.

13. Collected specimens may be used for scientific or educational purposes only, shall be dedicated to public benefit, and shall not be used for commercial profit.

14. The NPS reserves the right to designate the depository of all specimens removed from the park and to approve or restrict transfers of specimens between depositories. The NPS also reserves the right to designate the U.S. National Museum or the park museum as the depository of any specimen removed from the park, after the collector has made necessary studies and published the results of those studies.

15. Each specimen (or groups of specimens labeled as a group) that is stored, exhibited, conserved, etc. must bear labels stating that they are the property of the NPS and must be accessed and cataloged in the NPS National Catalog.

16. One copy (or more if specified) of all scientific and other publications resulting entirely or in part from research and/or collecting through the issuance of this permit will be furnished to the Superintendent of the park. Field notes should be copied and furnished in either electronic format (portable document file â pdf) or as a hard copy. For information regarding cataloging, identification or deposition of field notes and reports, contact Museum Curator Melanie Spoo at (760) 367-5571.

17. This permit expires on the date shown, but no later than December 31 of the year issued. A new collecting permit may be issued for each subsequent calendar year of study only after the Investigator's Annual Report for the completed year is received by the park Superintendent.

Permit:JOTR-2011-SCI-0030 - Page 3 of 6

18. Nothing in this permit shall be construed as granting any exclusive research privileges or automatic right to continue, extend, or renew this or any other line of research under new permit(s). Each research/collecting proposal request will be evaluated on its own merit.

19. Violation of these terms and conditions may result in the suspension or revocation of the permit. Failure on the part of the collector(s) to adhere to the policies outlined by the park and those policies as stipulated in the Code of Federal Regulations (CFR), Title 36, Section 2.5, and National Park Service (NPS) Management Policies may result in the withdrawal of this collecting permit.

20. 36 CFR, Chapter 1, Section 2.5 -- Research Specimens: further defines and clarifies the basic conditions under which this permit is issued.

21. Authority - The permittee is granted privileges covered under this permit subject to the supervision of the superintendent or a designee, and shall comply with all applicable laws and regulations of the National Park System area and other federal and state laws. A National Park Service (NPS) representative may accompany the permittee in the field to ensure compliance with regulations.

22. Responsibility - The permittee is responsible for ensuring that all persons working on the project adhere to permit conditions and applicable NPS regulations. Violations of the conditions of this permit may be punishable by a fine as provided by law, or by imprisonment not exceeding 6 months, or both, and shall be adjudged to pay all costs of the proceedings. 36 CFR, Chapter 1, Section 1.3(a).

23. False information - The permittee is prohibited from giving false information that is used to issue this permit. To do so will be considered a breach of conditions and be grounds for revocation of this permit and other applicable penalties.

24. Assignment - This permit may not be transferred or assigned. Additional investigators and field assistants are to be coordinated by the person(s) named in the permit and should carry a copy of the permit while they are working in the park. The principal investigator shall notify the park's Research and Collecting Permit Office when there are desired changes in the approved study protocols or methods, changes in the affiliation or status of the principal investigator, or modification of the name of any project member. Changes must be approved and noted on the permit before implemented. Attaching email correspondence confirming changes is an acceptable method of noting changed activities.

25. Revocation - This permit may be terminated for breach of any condition. The permittee may consult with the appropriate NPS Regional Science Advisor to clarify issues resulting in a revoked permit and the potential for reinstatement by the park superintendent or a designee.

26. Reports - The permittee is required to submit an Investigatorâ s Annual Report and copies of final reports, publications, and other materials resulting from the study. Principal Investigators will receive emailed instructions on how and when to submit an annual report. This is typically completed at the end of the calendar year. Park research coordinators will analyze study proposals to determine whether copies of field notes, databases, maps, photos, and/or other materials may also be requested. The permittee is responsible for the content of reports and data provided to the National Park Service.

27. Confidentiality - The permittee agrees to keep the specific location of sensitive park resources confidential. Sensitive resources include threatened species, endangered species, and rare species, archeological sites, caves, fossil sites, minerals, commercially valuable resources, and sacred ceremonial sites.

28. Methods of travel - Travel within the park is restricted to only those methods that are available to the general public unless otherwise specified in additional stipulations associated with this permit.

29. Other permits - The permittee must obtain all other required permit(s) to conduct the specified project.

30. Insurance - If liability insurance is required by the NPS for this project, then documentation must be provided that it has been obtained and is current in all respects before this permit is considered valid.

31. Mechanized equipment - No use of mechanized equipment in designated, proposed, or potential wilderness areas is allowed unless authorized by the superintendent or a designee in additional specific conditions associated with this permit. Use of artificial light for the purposes of viewing wildlife, that is not expressly stated in this permit is prohibited. [CFR 36, Part 1, Ch 2.2 (b)(4)(e)]

32. NPS participation - The permittee should not anticipate assistance from the NPS unless specific arrangements are made and documented in either an additional stipulation attached to this permit or in other separate written agreements.

33. Permanent markers and field equipment - The permittee is required to remove all markers or equipment from the field after the completion of the study or prior to the expiration date of this permit. The superintendent or a designee may modify this requirement through additional park specific conditions that may be attached to this permit. Additional conditions regarding the positioning and identification of markers and field equipment may be issued by staff at individual parks.

34. Access to park and restricted areas - Approval for any activity is contingent on the park being open and staffed for required operations. No entry into restricted areas is allowed unless authorized in additional park specific stipulations attached to this permit.

35. Notification - The permittee is required to contact the parkâ s Research and Collecting Permit Office (or other offices if indicated in the stipulations associated with this permit) prior to initiating any fieldwork authorized by this permit. Ideally this contact should occur at least one week prior to the initial visit to the park.

36. Expiration date - Permits expire on the date listed. Nothing in this permit shall be construed as granting any exclusive research privileges or automatic right to continue, extend, or renew this or any other line of research under new permit(s).

37. Other stipulations - This permit includes by reference all stipulations listed in the application materials or in additional attachments to this permit provided by the superintendent or a designee. Breach of any of the terms of this permit will be grounds for revocation of this permit and denial of future permits.

Permit:JOTR-2011-SCI-0030 - Page 5 of 6

Recommended by park staff(name and title):

Reviewed by Collections Manager:

Yes ___ No ___

Approved by park official:

Date Approved:

Title:

Superintendent

I Agree To All Conditions And Restrictions Of this Permit As Specified
(Not valid unless signed and dated by the principal investigator)

(Principal investigator's signature)

6/6/2011
(Date)

THIS PERMIT AND ATTACHED CONDITIONS AND RESTRICTIONS MUST BE CARRIED AT ALL TIMES WHILE CONDUCTING RESEARCH ACTIVITIES IN THE DESIGNATED PARK(S)

Permit:JOTR-2011-SCI-0030 - Page 6 of 6