

# ARIZONA GOLDEN EAGLE NEST SURVEY 2014

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## INTRODUCTION

In 1940, Congress passed the Bald Eagle Protection Act to protect declining bald eagle populations (*Haliaeetus leucocephalus*). In 1962, this act was amended to include golden eagles (*Aquila chrysaetos*), becoming the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d, 54 Stat. 250). In addition to the Eagle Act, golden eagles in Arizona are protected by the Migratory Bird Treaty Act, Lacey Act, Airborne Hunting Act, the Convention on International Trade in Endangered Species of Wild Flora and Fauna, and Arizona Revised Statute Title 17.

In 2007, the U.S. Fish and Wildlife Service (USFWS) codified the definition of “disturb” under the Eagle Act. Disturb includes any action that “causes, or is likely to cause...injury to an eagle” or by “interference with normal breeding, feeding, or sheltering behavior causing a decrease in productivity or nest abandonment” (USFWS 2007a, b). The USFWS also finalized regulations to provide a mechanism to authorize take under the Eagle Act (USFWS 2009). However, for implementation of take permits to be compatible with the congressional intent of the Eagle Act (i.e., stable or increasing breeding populations), accurate population estimates are needed.

Few long-term studies have been conducted on golden eagle populations in North America (e.g., Kochert and Steenhof 2002, Kochert et al. 2002, McIntyre 2002). Braun et al. (1975) estimated as many as 100,000 individuals in North America in the 1970s. Olendorff et al. (1981), using data from USFWS aerial transect surveys in 1974-1978 and other data sources, estimated the wintering population of golden eagles in the western U.S. at 63,242 birds, with a potential 20,500 North American breeding pairs. Watson (1997) estimated the number of breeding pairs at 20,000-25,000 in North America.

More recently, beginning in 2003 the USFWS contracted with Western EcoSystems Technology, Inc. (WEST) to complete golden eagle aerial transect surveys across much of the species’ range in the western United States in late summer. The surveys were expanded and repeated in 2006-2013, and estimates ranged from 19,410 to 29,757 total golden eagles within the study area (Good et al. 2004, Good et al. 2007, Nielson et al. 2013). Millsap et al. (2013) presented a composite analysis using the WEST transect data in conjunction with Breeding Bird Survey data. Their results indicate a generally stable population across the western U.S. over the past 40 years.

In Arizona, studies have reported golden eagle productivity (Millsap 1981), prey remains in nests (Eakle and Grubb 1986), and nest structure (Grubb and Eakle 1987). The Arizona Breeding Bird Atlas (Corman and Wise-Gervais 2005) found possible, probable, or confirmed evidence of breeding golden eagles in 187 of 1,834 (10.2%) priority blocks. The Arizona Game and Fish Department (Department) gathered additional data during a 2006 survey effort, which found 14 occupied nests among 85 surveyed locations that had been identified as historic or current

breeding areas (Arizona Game and Fish Department unpublished data). Some of the historic data had been collected in the 1970s from observations by the Department's wildlife managers.

The Department began intensive statewide nest surveys in 2011, when the Bureau of Land Management (BLM) funded a two-year baseline inventory of potential nest sites primarily within, and adjacent to, proposed wind and solar energy projects. Surveys continued in 2013-2014 with additional funding from BLM and the U.S. Forest Service (USFS). Since 2011, a total of 124 new breeding areas and 367 potential breeding areas were found (McCarty and Jacobson 2011, 2012; McCarty et al. 2013). This report covers the results of the 2014 surveys conducted by the Department's Nongame Wildlife Branch, with additional data incorporated from surveys completed by the Department's Wildlife Contracts Branch under a Department of Defense Legacy Program grant.

### STUDY AREA

In 2014, surveyed and monitored habitat included: 1) southeastern Arizona from the Tohono O'odham Nation east to New Mexico, south of San Carlos Apache Tribe lands and mostly north of Interstate 10; 2) Tonto National Forest in central Arizona; and 3) east central Arizona from Clear Creek east to New Mexico, north of the Mogollon Rim and south of Navajo Nation and Hopi Tribe lands. Helicopter surveys were conducted in portions of Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Navajo, Pima, Pinal, and Yavapai Counties (Figure 1). In part, the effort covered BLM, USFS, and State Trust lands plus adjacent areas with proposed wind or solar energy development projects. These lands were often intermingled with private properties.

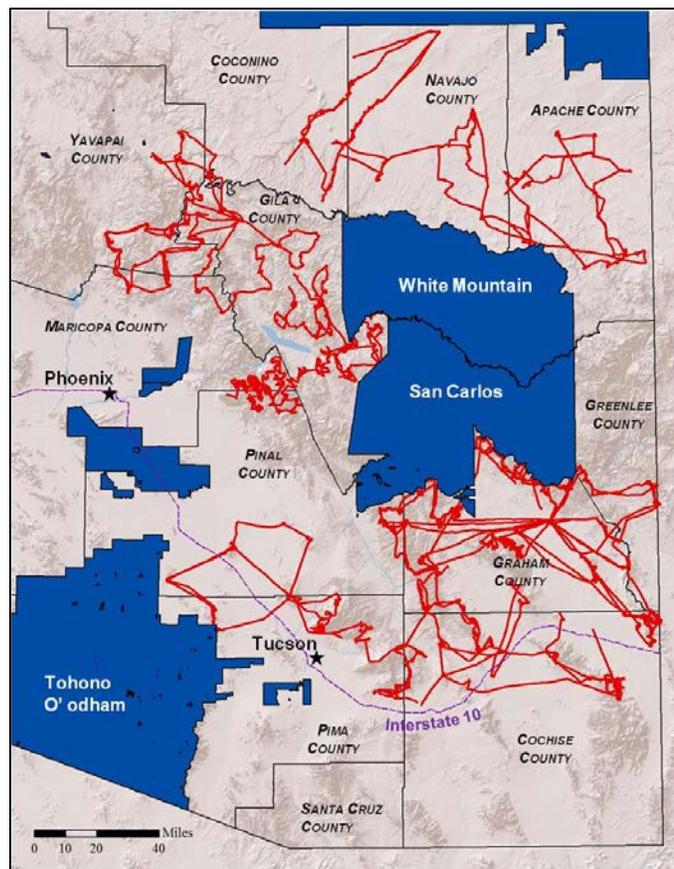


Figure 1. Aerial golden eagle occupancy and nest surveys completed in 2014 Flight tracks in red. Native American lands in blue.

The surveyed area included a variety of habitat types, characterized by nine biotic communities including Chihuahuan Desertscrub, Great Basin Conifer Woodland, Great Basin Desertscrub, Interior Chaparral, Madrean Evergreen Woodland, Plains and Great Basin Grassland, Rocky Mountain (Petran) Montane Conifer Forest, Semidesert Grassland, and Sonoran Desertscrub [Arizona Upland subdivision and Lower Colorado River Valley subdivision] (Brown 1994).

Elevation ranged from approximately 400 m (1,300 ft) at the Salt River to 2,438 m (8,000 ft) in the Pinaleno Mountains.

## METHODS

Survey efforts were focused on two objectives: 1) To collect occupancy data at golden eagle breeding areas (BAs) and potential BAs identified during surveys efforts in 2011-2013, and 2) to survey new areas. At select sites, ground visits were conducted to band and put transmitters on young.

To collect occupancy data, a sample of nest sites was selected by choosing routes to maximize the number of nests visited during the available flight time and considering refueling locations. Two visits at each BA were scheduled at least 30 days apart. The first visit coincided with pre- and early-incubation behavior in late February or early March. The second visit occurred in late March to early April. At some BAs, a third visit was scheduled in May to gather additional data on number of young hatched, and to document nest success or failure. All known alternate nests were examined at each BA or potential BA until occupancy status could be determined.

Most of the surveys in new areas occurred in the Superstition Wilderness and Salt River Wilderness Area. While the goal of these surveys was to inventory large eagle-sized nests, flights were timed within the breeding season (late April) in order to opportunistically collect occupancy data.

Additional occupancy and nest inventory surveys were completed by the Department's Wildlife Contracts Branch in April-June. Occupancy surveys consisted of observations from either fixed wing aircraft or ground crews below Military Training Routes in northern and western Arizona. Nest surveys were conducted via helicopter over two days (April 6 and June 1) on the Yuma Proving Ground and over four days (August 9-10, 23-24) on the Barry M. Goldwater Range (Sturla et al. 2014a, Sturla et al. 2014b).

Helicopters are an indispensable tool for surveying eagle nests in remote and inaccessible terrain throughout Arizona (e.g., McCarty and Jacobson 2012) and served as the Department's primary survey method. A two to three-person team of biologists conducted the helicopter surveys. Helicopters were flown at approximately 60 meters (200 ft) above ground level and at 50-60 knots (approximately 60-70 mph). Altitude and speed were influenced by topography, presence of high-tension wires, and wind. Multiple passes of tall cliffs and complex terrain were necessary for a complete survey of these substrates.

The minimum data gathered for each observation included the time and a GPS waypoint using a Garmin GPSMAP 62s, Oregon 450, or Colorado 400t unit. Information on the occupancy status, nest size, nest condition, and nest aspect were also collected. Digital photos were taken of active nests at all new BAs, as well as most other large nests when possible. Other nesting species were noted opportunistically.

We followed operational definitions derived from Postupalsky (1974, 1983) and Steenhof and Kochert (1982) to describe breeding status (Appendix A). A site was termed a "breeding area"

only if it had been documented as occupied at least once within the last ten years. Sites with documented occupancy more than ten years old were termed “historic BAs”. However, in many cases a site designated as historic reflects a lack of occupancy monitoring rather than a ten year period when the site was known to be unoccupied. Areas with one or more “large” nests but not enough observations to designate occupancy status were termed as “potential BAs”. All potential or historic BAs documented as occupied during nest surveys will be reclassified as BAs in future reports. “Large” refers to nests we deemed of suitable size for breeding golden eagles as compared to our experience with golden eagle nests in Arizona. “Medium” refers to nests that were not likely to have been large enough for eagles. Golden eagle nestlings were aged following Hoehlin (1976) and Driscoll (2010).

## RESULTS

The 2014 golden eagle survey effort totaled 102.6 hours (6,153 minutes) of aerial surveys over 20 days (Appendix B). In addition, the Wildlife Contracts Branch conducted approximately 75 hours of aerial surveys over 13 days and 110 hours of ground surveys over 20 days. In total, we surveyed 255 areas for occupancy, including 78 BAs, 25 historic BAs, and 152 potential BAs. A total of 75 BAs were occupied including 34 new BAs, 32 previously known BAs, and 9 re-occupied historic BAs. We also discovered 73 new potential BAs consisting of 151 large nests.

Of the 78 BAs examined, four were surveyed only once and status was considered undetermined. At the 74 remaining sites, 32 (43.2%) were found occupied by golden eagles and 42 (56.8%) were unoccupied (Table 1).

Of the 25 historic BAs examined, two were surveyed only once and status was considered undetermined. At the remaining 23 sites, nine (39.1%) were found occupied by golden eagles and 14 (60.9%) were unoccupied.

Of the 152 potential BAs examined, 11 were surveyed only once and status was considered undetermined. At the remaining 141 sites, 25 (17.7%) were found occupied by golden eagles and 116 (82.3%) were unoccupied.

Productivity was not an objective of the surveys, however 40 nestlings were observed hatched at 33 of 65 active sites. Although the final status was not determined for many of the active nests, 24 (36.9%) breeding attempts were confirmed failed. Most of the failures (79.2%, n=19) occurred during incubation or prior to observation of nestlings.

Number of:	BAs	Historic BAs	Potential BAs	New BAs	Total
Areas checked	78	25	152	9	264
Occupied <sup>1</sup>	32	9	25	9	75
Unoccupied	42	14	116	--	172
Undetermined status*	4	2	11	--	17
Active <sup>1</sup>	29	7	21	8	65

<sup>1</sup>Data represents the minimum number detected.

\*Sites were surveyed or found only one time.

Areas worthy of discussion (new BAs, potential BAs, historic BAs, BAs, and additional golden eagle sightings) are described below. Nest locations are sensitive data, considered confidential by AGFD, and omitted from this report. Management agencies requiring specific locations should contact the AGFD Heritage Data Management System at (623) 236-7618.

#### SURVEYS IN SUITABLE NESTING HABITAT

Nine new BAs consisting of 29 nests were discovered during surveys in new habitat. Eight of these new sites were active. When these breeding attempts were last observed, one was documented as failed during incubation and seven were still active. Also, 73 new potential BAs consisting of 151 nests were discovered (Table 2 and Appendix C). At three of these new potential BAs, a single golden eagle was observed near at least one large nest (Table 3) indicating possible occupancy, but did not satisfy the criteria for designation as an occupied BA.

#### Cochise County

*Fisher (new)*. – On April 3, a golden eagle was incubating in a new cliff nest (#1), and three other large nests (#2-4) were found. A 7-week old nestling was observed on May 23.

#### Gila County

*Apache (new)*. – On March 6, a golden eagle was incubating in a new cliff nest (#1), however the nest was empty on April 24 (Figure 2). One other large nest (#2) was also found.

*Jumpoff (new)*. – On March 6, a golden eagle was incubating in a new cliff nest (#1). On April 11, an adult was in the nest with a small nestling, 1-2 weeks old (Figure 2). Four other large nests (#2-5) were also found.



Figure 2. Apache (left) and Jumpoff (right) breeding areas. Photos by Kurt Licence.

*Sevenmile (new)*. – On March 6 and April 11, a golden eagle was incubating in a new cliff nest (#1), and one other large nest (#2) was found (Figure 3).

#### Graham County

*Pinaleno 3 (new)*. – On April 4, a golden eagle was incubating in a new cliff nest (#1), and two other large nests (#2-3) were found.

*Pinaleno 4 (new)*. – On April 4, a golden eagle was incubating in a new cliff nest (#1), and two other large nests (#2-3) were found (Figure 3).



Figure 3. Sevenmile (left) and Pinaleno 4 (right) breeding areas. Photos by Kurt Licence.

Graham/Greenlee County

*Peloncillo Mountains 3 (new)*. – On February 24, a pair of golden eagles was observed near three large, empty nests (#1-3).

Maricopa County

*Superstition 1 (new)*. – On April 25, an adult golden eagle was observed in a new cliff nest (#1) with a small nestling, 1-2 weeks old.

Pinal County

*Millsite (new)*. – On April 25, a golden eagle was incubating in a new cliff nest (#1), and three other large nests (#2-4) were found.

Table 2. Summary of new breeding areas discovered in suitable nesting habitat in 2014.				
Breeding Area	Status <sup>1</sup>	Dates surveyed	Number of nests	Comments
<b>Cochise County</b>				
Fisher	A	4/3, 5/23	4	Incubating in nest #1 on 4/3. One 7-week old nestling on 5/23.
<b>Gila County</b>				
Apache	F	3/6, 4/24	2	Incubating in nest #1 on 3/6. Nest empty on 4/24.
Jumpoff	A	3/6, 4/11	5	Incubating in nest #1 on 3/6. One nestling 1-2 weeks old on 4/11.
Sevenmile	A	3/6, 4/11	2	Incubating in nest #1 on 3/6 and 4/11.
<b>Graham County</b>				
Pinaleno 3	A	4/4	3	Incubating in nest #1 on 4/4.
Pinaleno 4	A	4/4	3	Incubating in nest #1 on 4/4.
<b>Graham/Greenlee County</b>				
Peloncillo Mountains 3	O	2/24, 4/2	3	Pair of golden eagles on 2/24.
<b>Maricopa County</b>				
Superstition 1	A	4/25	3	One nestling 1-2 weeks old on 4/25.

<sup>1</sup>Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed.

Table 2 continued.				
Breeding Area	Status <sup>1</sup>	Dates surveyed	Number of nests	Comments
<b>Pinal County</b>				
Millsite	A	4/25	4	Incubating in nest #1 on 4/25.

<sup>1</sup>Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed.

Table 3. Summary of golden eagle sightings near large nests in 2014.			
Location	Date	Number of nests	Comments
<b>Cochise County</b>			
Chiricahua 1	2/26	2	One adult perched.
<b>Pima County</b>			
Martinez	2/27	1	One adult perched.
<b>Pinal County</b>			
Superstition 10	4/25	1	One adult perched.

POTENTIAL BREEDING AREAS

Of the 152 potential BAs surveyed, occupancy was confirmed at 25 sites (Table 4). Among the occupied sites, 21 were active. When these breeding attempts were last observed, three were successful, 11 were still active, and seven had failed. Additionally, at 12 potential BAs only a single golden eagle was observed indicating possible occupancy, but did not satisfy the criteria for designation as an occupied BA.

Apache County

*Concho.* – On March 4, a great horned owl was incubating in nest #1.

Cochise County

*Boulder Canyon.* – On February 26 and April 3, a golden eagle was incubating in nest #2, and one 7.5-week old nestling was in the nest on May 23.

*Little Rincon Mountains.* – One golden eagle was observed on February 24.

*Peloncillo Mountains 1.* – One golden eagle was observed on February 25.

*Peloncillo Mountains 2.* – On April 4, a golden eagle was incubating in nest #1. A nestling was observed on May 23 at 5.5 weeks old. The Department banded the nestling and fitted it with a backpack satellite transmitter at 8 weeks old on June 11. Satellite data indicated the nestling successfully fledged.

*Winchester Mountains 1.* – On April 1, a red-tailed hawk was incubating in nest #1.

Coconino County

*Clear Creek 5.* – Nest #1 was not surveyed on April 10 due to flight safety concerns. Therefore, the breeding status was undetermined.

*Kanab 1.* – All known nests were empty on April 8. The site was not visited again, thus the breeding status was undetermined.

*Paria River.* – On April 8, a golden eagle was incubating in nest #1, however the nest was empty on May 2.

*Vermilion Cliffs (Sand Crack).* – In 2011, two large cliff nests were found in close proximity and the site was noted as a potential BA. New information from The Peregrine Fund biologists confirmed this site was occupied by golden eagles in 2012. To maintain consistency with their reporting, we have renamed the site and will refer to it as the Sand Crack BA.

#### Gila County

*Bryant Mountain.* – On April 11, a red-tailed hawk was incubating in nest #1.

*Dupont.* – On March 6, a golden eagle was incubating in a new cliff nest (#6). On April 11, an adult was observed in the nest with one egg, however the nest was empty on May 21.

*East Verde 1.* – All known nests were empty and no golden eagles were observed on March 5. The site was not visited again, thus the breeding status was undetermined.

*Hardscrabble Canyon 2.* – No nests were found on March 4. The site was not visited again, thus the breeding status was undetermined.

*Irving Power Plant.* – No nests were found on March 4. The site was not visited again, thus the breeding status was undetermined.

*Limestone Hills.* – On April 10, a golden eagle was incubating in nest #1.

*Mailbox Mesa.* – On April 11, a golden eagle was incubating in nest #1. A 3.5-week old nestling was observed on May 21. The Department banded the nestling and fitted it with a backpack satellite transmitter at 7.5 weeks old on June 16. Satellite data indicated the nestling successfully fledged.

*Salome Wilderness 1.* – All known nests were empty and no golden eagles were observed on March 6. The site was not visited again, thus the breeding status was undetermined.

*Salt River Canyon.* – All known nests were empty and no golden eagles were observed on March 14. The site was not visited again, thus the breeding status was undetermined.

*Sierra Ancha 5.* – On March 6, a golden eagle was incubating in nest #3. Two unhatched eggs were observed on April 11, and the nest was empty on May 21.

*Spring Creek.* – On March 5, a golden eagle was incubating in nest #2. The nest was empty and one adult was perched nearby on April 11.

#### Graham County

*Galiuro Mts 1.* – On February 25 and April 2, a golden eagle was incubating in nest #1.

*Galiuro Mts 9.* – On April 1, a pair of golden eagles was observed.

*Galiuro Mts 11.* – On April 1, a golden eagle was incubating in nest #1. Two nestlings were observed at 4.5-5.5 weeks old on May 23.

*Gila Mountains 1.* – No nests were found on February 24 and April 3, and the breeding status was undetermined.

*Gila Mountains 4.* – On February 24 and April 3, a golden eagle was incubating in nest #3. The nest was empty on May 23.

*Oliver Knoll.* – One golden eagle was observed on April 3.

*Santa Teresa Mtns 1.* – On February 25 and April 2, a golden eagle was incubating in nest #3. A 6.5-week old nestling was observed on May 23.

*Santa Teresa Mtns 2.* – No nests were found on February 25, and the breeding status was undetermined.

*Santa Teresa Mtns 3.* – On April 2, a peregrine falcon was observed standing in nest #1.

*Santa Teresa Mtns 4.* – One golden eagle was observed on February 25.

*Santa Teresa Mtns 5.* – One golden eagle was observed on February 25.

*Santa Teresa Mtns 8.* – One golden eagle was observed on April 2.

*Turtle Mountain 1.* – On April 24, a golden eagle was incubating in a new cliff nest (#6). One small nestling was observed on April 3, and the nest was empty on May 23.

*Whitlock Mountains 3.* – On April 3, a golden eagle was incubating in a new cliff nest (#2). One 7-week old nestling was observed on May 23.

#### Maricopa County

*New River Mountains 2.* – On April 10, a pair of golden eagles was standing in nest #1.

#### Mohave County

*Black Mtns 28.* – On March 18, a pair of golden eagles was observed.

*Lost Spring.* – On April 8, a golden eagle was incubating in nest #1. A nestling was observed at 3 weeks old on May 2, and at 8 weeks old on June 2.

*Lost Spring 2.* – On April 8 and May 2, a golden eagle was incubating in nest #1. One unhatched egg was observed in the nest on June 2.

*Virgin Mtns 6.* – On April 8, a golden eagle was incubating in nest #1. A nestling was observed at 1 week old on May 2, and at 5 weeks old on June 2.

Navajo County

*Black Canyon.* – On April 9, a golden eagle was incubating in nest #2. A nestling was observed at 3 weeks old on May 21.

*Chevelon Canyon 3.* – On April 10, a pair of golden eagles was standing in nest #2.

Pima County

*Cochie Canyon.* – On March 31, a golden eagle was incubating in a new cliff nest (#6). The nest was empty on May 23.

*Joaquin Canyon.* – All known nests were empty and no golden eagles were observed on February 27. The site was not visited again, thus the breeding status was undetermined.

*Pusch Ridge Wilderness 1.* – No nests were found during two visits, however strong winds prevented an effective aerial survey on February 27. Therefore, the breeding status was undetermined.

*Pusch Ridge Wilderness 2.* – Strong winds prevented an effective aerial survey on February 27. Therefore, the breeding status was undetermined.

Pinal County

*Aravaipa Canyon 3.* – One golden eagle was observed on February 25.

*Little Table Mountain.* – A common raven was incubating in nest #1 on April 2.

*Mining Mountain.* – No nests were found during a survey February 25, and the breeding status was undetermined.

*Wildcat Peak.* – On February 27, a red-tailed hawk appeared to be incubating in nest #1, but the species was not confirmed.

*Zapata Mountain.* – One golden eagle was observed on April 2.

Yavapai County

*Agua Fria 1.* – On March 5, a golden eagle was incubating in nest #1. A very small nestling was observed on April 10. The nestling was 3.5-weeks old on April 30.

*Mazatzal Wilderness 5.* – On March 5, a golden eagle was incubating in nest #3. A small nestling was observed on April 11.

*New River 1.* – All known nests were empty and no eagles were observed on March 5. The site was not visited again, thus the breeding status was undetermined.

*Rugged Mesa.* – One golden eagle was observed on April 10.

*Sunset Mountain.* – On March 5, a bald eagle was incubating in nest #1. The nest occurred within the Horseshoe bald eagle BA and will be re-named as Horseshoe nest #13. We will continue to monitor the site during bald eagle surveys.

Table 4. Summary of potential breeding areas surveyed for occupancy in 2014.				
Location	Status <sup>1</sup>	Dates	Number of nests	Result
<b>Apache County</b>				
Concho	U	3/4	1	Great-horned owl incubating on 3/4.
LCR Becker	U	3/4, 4/9	1	All known nests empty. No eagles seen.
<b>Cochise County</b>				
Boulder Canyon*	A	2/26, 4/3, 5/23	3	Incubating in nest #2 on 2/26 and 4/3. One nestling, 7.5 weeks old on 5/23.
Bowie Mountain	U	2/26, 4/3	3	All known nests empty. No eagles seen.
Eagle Peak	U	2/27, 4/1	1	All known nests empty. No eagles seen.
Johnny Lyon Hills	U	2/26, 4/1	2	All known nests empty. No eagles seen.
Little Dragoon Mts 1	U	2/26, 4/1	2	All known nests empty. No eagles seen.
Little Dragoon Mts 2	U	2/26, 4/1	2	All known nests empty. No eagles seen.
Little Rincon Mountains	U	2/24, 4/1	5	All known nests empty. One golden eagle on 2/24.
Peloncillo Mountains 1	U	2/25, 4/4	4	All known nests empty. One golden eagle on 2/25.
Peloncillo Mountains 2*	S	2/25, 4/4, 5/23, 6/11	9	Incubating in nest #1 on 4/4. One nestling, 5.5 weeks old on 5/23. One nestling, 8 weeks old on 6/11.
Silver Peak	U	2/26, 4/3	3	All known nests empty. No eagles seen.
Teran Basin	U	2/26, 4/1	3	All known nests empty. No eagles seen.
Winchester Mountains 1	U	2/26, 4/1	1	Red-tailed hawk incubating on 4/1.
Winchester Mountains 2	U	2/26, 4/1	3	All known nests empty. No eagles seen.
Winchester Mountains 3	U	2/26, 4/1	1	All known nests empty. No eagles seen.
<b>Coconino County</b>				
Chevelon Canyon 2	U	3/3, 4/10	1	All known nests empty. No eagles seen.
Clear Creek 3	U	3/3, 4/10	2	All known nests empty. No eagles seen.
Clear Creek 4	U	3/3, 4/10	2	All known nests empty. No eagles seen.
Clear Creek 5	--	3/3, 4/10	1	All known nests empty. No eagles seen. Not effectively surveyed on 4/10.
Clear Creek 6	U	3/3, 4/10	2	All known nests empty. No eagles seen.
Kanab 1	--	4/8	1	All known nests empty. No eagles seen.
Paria River*	F	4/8, 5/2	3	Incubation on 4/8. Nest empty on 5/2.
<b>Gila County</b>				
Armer Gulch	U	3/6, 4/11	2	All known nests empty. No eagles seen.
Bryant Mountain	U	3/5, 4/11	1	Red-tailed hawk incubating on 4/11.
Cherry Creek 2	U	3/6, 4/11	2	All known nests empty. No eagles seen.
Cherry Creek 3	U	3/6, 4/11	2	All known nests empty. No eagles seen.
Cherry Creek 4	U	3/6, 4/11	2	All known nests empty. No eagles seen.
Cherry Creek 5	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Coon Creek Butte	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Dupont*	F	3/6, 4/11, 5/21	6	Incubating in new nest #6. Adult with one egg on 4/11. Nest empty on 5/21.
Dutchwoman Butte	U	3/6, 4/11	1	All known nests empty. No eagles seen.

<sup>1</sup> Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed, -- =undetermined.

\*Indicates a new breeding area was confirmed.

Table 4 continued.				
Location	Status <sup>1</sup>	Dates	Number of nests	Result
East Verde 1	--	3/5	2	All known nests empty. No eagles seen.
Gisela Mountain	U	3/5, 4/11	4	All known nests empty. No eagles seen.
Hardscrabble Canyon 2	--	3/4	2	No nests found. No eagles seen.
Hellgate Wilderness 1	U	3/5, 4/11	3	All known nests empty. No eagles seen.
Hieroglyphic Canyon	U	3/5, 4/10	2	All known nests empty. No eagles seen.
Irving Power Plant	--	3/4	1	No nests found. No eagles seen.
Limestone Hills*	A	3/5, 4/10	1	Incubating on 4/10.
Mailbox Mesa*	S	3/5, 4/11, 5/21, 6/16	1	Incubating in nest #1 on 4/11. One nestling, 3.5 weeks old on 5/21. One nestling, 7.5 weeks old on 6/16.
Mazatzal Wilderness 2	U	3/5, 4/10	1	All known nests empty. No eagles seen.
Mazatzal Wilderness 3	U	3/5, 4/10	1	All known nests empty. No eagles seen.
Naegelin	U	3/5, 4/11	1	All known nests empty. No eagles seen.
Pueblo Canyon	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Salome Wilderness 1	--	3/6	1	All known nests empty. No eagles seen.
Salome Wilderness 2	U	3/6, 4/11	2	All known nests empty. No eagles seen.
Salt River Canyon	--	3/14	5	All known nests empty. No eagles seen.
Sandrock Canyon	U	3/4, 4/10	2	All known nests empty. No eagles seen.
Sheep Basin Mountain	U	3/5, 4/11	1	All known nests empty. No eagles seen.
Sierra Ancha 1	U	3/5, 4/11	1	All known nests empty. No eagles seen.
Sierra Ancha 2	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Sierra Ancha 3	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Sierra Ancha 4	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Sierra Ancha 5*	F	3/6, 4/11, 5/21	5	Incubating in nest #3 on 3/6. Two unattended eggs on 4/11. Nest empty on 5/21.
Sierra Ancha 6	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Sierra Ancha 7	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Sierra Ancha 8	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Spring Creek*	F	3/5, 4/11	2	Incubating in nest #2 on 3/5. Nest empty and one adult perched on 4/11.
Three Sisters Mountain	U	3/6, 4/11	2	All known nests empty. No eagles seen.
Tonto Creek 1	U	3/5, 4/11	1	All known nests empty. No eagles seen.
Vosburg Mesa	U	3/5, 4/11	1	All known nests empty. No eagles seen.
Walnut Creek	U	3/6, 4/11	1	All known nests empty. No eagles seen.
Graham County				
Diamond Bar Peak	U	2/24, 4/3	2	All known nests empty. No eagles seen.
Dry Mountain	U	2/25, 4/3	1	All known nests empty. No eagles seen.
Galiuro Mts 1*	A	2/25, 4/2	1	Incubating in nest #1 on 2/25 and 4/2.
Galiuro Mts 2	U	2/25, 4/2	1	All known nests empty. No eagles seen.
Galiuro Mts 3	U	2/25, 4/2	2	All known nests empty. No eagles seen.
Galiuro Mts 4	U	2/25, 4/3	2	All known nests empty. No eagles seen.
Galiuro Mts 5	U	2/25, 4/3	2	All known nests empty. No eagles seen.
Galiuro Mts 6	U	2/25, 4/3	3	All known nests empty. No eagles seen.
Galiuro Mts 7	U	2/26, 4/1	2	All known nests empty. No eagles seen.
Galiuro Mts 8	U	2/26, 4/1	1	All known nests empty. No eagles seen.
Galiuro Mts 9*	O	2/26, 4/1	4	All known nests empty. Pair of golden eagles on 4/1.
Galiuro Mts 10	U	2/26, 4/1	1	All known nests empty. No eagles seen.

<sup>1</sup> Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed, -- =undetermined.

\*Indicates a new breeding area was confirmed.

Table 4 continued.				
Location	Status <sup>1</sup>	Dates	Number of nests	Result
Galiuro Mts 11*	A	2/26, 4/1, 5/23	2	Incubating in nest #1 on 4/1. Two nestlings, 4.5-5.5 weeks old on 5/23.
Galiuro Mts 12	U	2/25, 4/2	1	All known nests empty. No eagles seen.
Gila Mountains 1	--	2/24, 4/3	1	No nests found. No eagles seen.
Gila Mountains 2	U	2/24, 4/3	1	All known nests empty. No eagles seen.
Gila Mountains 3	U	2/24, 4/3	2	All known nests empty. No eagles seen.
Gila Mountains 4*	F	2/24, 4/3, 5/23	3	Incubating in nest #3 on 2/24 and 4/3. Nest empty on 5/23.
Gila Mountains 5	U	2/24, 4/3	2	All known nests empty. No eagles seen.
Gila Mountains 6	U	2/24, 4/2	5	All known nests empty. No eagles seen.
Gila Mountains 7	U	2/24, 4/3	1	All known nests empty. No eagles seen.
Left Fork Markham Creek 1	U	2/24, 4/3	1	All known nests empty. No eagles seen.
Left Fork Markham Creek 2	U	2/24, 4/3	1	All known nests empty. No eagles seen.
Oliver Knoll	U	2/24, 4/3	4	All known nests empty. One golden eagle on 4/3.
Santa Teresa Mtns 1*	A	2/25, 4/2, 5/23	4	Incubating in nest #3 on 2/25 and 4/2. One nestling, 6.5 weeks old on 5/23.
Santa Teresa Mtns 2	--	2/25, 4/2	1	No nests found on 2/25. All known nests empty on 4/2. No eagles seen.
Santa Teresa Mtns 3	U	2/25, 4/2	1	One peregrine falcon standing in nest #1 on 4/2.
Santa Teresa Mtns 4	U	2/25, 4/2	1	All known nests empty. One golden eagle on 2/25.
Santa Teresa Mtns 5	U	2/25, 4/2	1	All known nests empty. One golden eagle on 2/25.
Santa Teresa Mtns 6	U	2/25, 4/2	2	All known nests empty. No eagles seen.
Santa Teresa Mtns 7	U	2/25, 4/2	1	All known nests empty. No eagles seen.
Santa Teresa Mtns 8	U	2/25, 4/2	8	All known nests empty. One golden eagle on 4/2.
Slaughter Mountain	U	2/24, 4/3	1	All known nests empty. No eagles seen.
Turtle Mountain 1*	F	2/24, 4/3, 5/23	6	Incubating in new nest #6 on 2/24. One very small nestling on 4/3. Nest empty on 5/23.
Turtle Mountain 2	U	2/24, 4/3	1	All known nests empty. No eagles seen.
Whitlock Mountains 1	U	2/25, 4/3	2	All known nests empty. No eagles seen.
Whitlock Mountains 2	U	2/25, 4/3	1	All known nests empty. No eagles seen.
Whitlock Mountains 3*	A	2/25, 4/3, 5/23, 5/30	4	Incubating in new nest #2 on 4/3. One nestling, 7 weeks old on 5/23.
Winchester Mountains 4	U	2/26, 4/1	2	All known nests empty. No eagles seen.
Winchester Mountains 5	U	2/26, 4/1	3	All known nests empty. No eagles seen.
Yellowstone Canyon	U	2/24, 4/2	2	All known nests empty. No eagles seen.
Maricopa County				
Mazatzal Wilderness 1	U	3/5, 4/11	1	All known nests empty. No eagles seen.
Mazatzal Wilderness 6	U	3/5, 4/11	2	All known nests empty. No eagles seen.
New River Mesa	U	3/5, 4/10	2	All known nests empty. No eagles seen.
New River Mountains 2*	O	3/5, 4/10	1	All known nests empty. Pair of golden eagles standing in nest #1 on 4/10.
Willow Spring Mountain	U	3/5, 4/10	1	All known nests empty. No eagles seen.

<sup>1</sup> Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed, -- =undetermined.

\*Indicates a new breeding area was confirmed.

Table 4 continued.				
Location	Status <sup>1</sup>	Dates	Number of nests	Result
<b>Mohave County</b>				
Black Mtns 26	U	3/18, 5/8	3	All known nests empty. No eagles seen.
Black Mtns 27	U	4/21, 5/8	1	All known nests empty. No eagles seen.
Black Mtns 28*	O	3/18, 5/8	1	Two golden eagles soaring together on 3/18.
Hurricane Cliffs North	U	4/, 5/2, 6/2	4	One golden eagle perched on 4/8 and 5/2.
Lost Spring*	S	4/8, 5/2, 6/2	1	Incubation in nest #1 on 4/8. One nestling, 3 weeks old on 5/2. One nestling, 8-weeks old on 6/2.
Lost Spring 2*	F	4/8, 5/2, 6/2	1	Incubation in nest #1 on 4/8 and 5/2. One unhatched egg in nest on 6/2.
Virgin Mtns 6*	A	4/8, 5/2, 6/2	1	Incubation in nest #1 on 4/8. One nestling, 1 week old on 5/2. One nestling, 5 weeks old on 6/2.
<b>Navajo County</b>				
Black Canyon*	A	3/3, 4/9, 5/21	3	Incubating in nest #2 on 4/9. One nestling, 3 weeks old on 5/21.
Chevelon Canyon 3*	O	3/3, 4/10	2	All known nests empty. Pair of golden eagles standing in nest #2 on 4/10.
Chevelon Canyon 4	U	3/3, 4/10	2	All known nests empty. No eagles seen.
Chevelon Canyon 5	U	3/3, 4/10	1	All known nests empty. No eagles seen.
Chevelon Canyon 6	U	3/3, 4/10	3	All known nests empty. No eagles seen.
Chevelon Canyon 7	U	3/3, 4/10	3	All known nests empty. No eagles seen.
Clear Creek 2	U	3/3, 4/10	3	All known nests empty. No eagles seen.
Pink Cliffs 2	U	3/3, 4/9	3	All known nests empty. No eagles seen.
<b>Pima County</b>				
Buster Mountain	U	2/27, 3/31	1	All known nests empty. No eagles seen.
Cochie Canyon*	F	2/27, 3/31, 5/23	6	Incubating in new nest #6 on 3/31. Nest empty on 5/23.
Joaquin Canyon	--	2/27	1	All known nests empty. No eagles seen.
Pusch Ridge Wilderness 1	--	2/27, 3/31	3	No nests found. No eagles seen. Not effectively surveyed on 2/27.
Pusch Ridge Wilderness 2	--	2/27, 3/31	1	All known nests empty. No eagles seen. Not effectively surveyed on 2/27.
Pusch Ridge Wilderness 3	U	2/27, 3/31	1	All known nests empty. No eagles seen.
Ragged Top	U	2/27, 3/31	6	All known nests empty. No eagles seen.
<b>Pinal County</b>				
Aravaipa Canyon 1	U	2/25, 4/2	1	All known nests empty. No eagles seen.
Aravaipa Canyon 2	U	2/25, 4/2	3	All known nests empty. No eagles seen.
Aravaipa Canyon 3	U	2/25, 4/2	5	All known nests empty. One golden eagle on 2/25.
Aravaipa Canyon 4	U	2/25, 4/2	1	All known nests empty. No eagles seen.
Little Table Mountain	U	2/25, 4/2	1	Common raven incubating in nest #1 on 4/2.
Mining Mountain	--	2/25, 4/2	2	No nests found on 2/25. All known nests empty on 4/2. No eagles seen.
Picacho Mountains	U	2/27, 3/31	3	All known nests empty. No eagles seen.
Wildcat Peak	U	2/27, 3/31	1	Possible red-tailed hawk incubating in nest #1 on 2/27.

<sup>1</sup> Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed, -- =undetermined.

\*Indicates a new breeding area was confirmed.

Table 4 continued.				
Location	Status <sup>1</sup>	Dates	Number of nests	Result
Zapata Mountain	U	2/25, 4/2	5	All known nests empty. One golden eagle on 4/2.
<b>Yavapai County</b>				
Agua Fria 1*	A	3/5, 4/10, 4/30	3	Incubating in nest #1 on 3/5. One very small nestling on 4/10. One nestling, 3.5 weeks old on 4/30.
Agua Fria 2	U	3/5, 4/10	2	All known nests empty. No eagles seen.
Fossil Pocket	U	3/4, 4/10	1	All known nests empty. No eagles seen.
Hell Canyon	U	3/5, 4/10	1	All known nests empty. No eagles seen.
Mazatzal Wilderness 4	U	3/5, 4/11	1	All known nests empty. No eagles seen.
Mazatzal Wilderness 5*	A	3/5, 4/11	3	Incubating in nest #3 on 3/5. One small nestling on 4/11.
New River 1	--	3/5	1	All known nests empty. No eagles seen.
New River Mountains 1	U	3/5, 4/10	1	All known nests empty. No eagles seen.
Rugged Mesa	U	3/5, 4/10	1	All known nests empty. One golden eagle on 4/10.
Sunset Mountain	U	3/5	2	Bald eagle incubating on 3/5.
Trap Canyon	U	3/5, 4/10	1	All known nests empty. No eagles seen.
West Clear Creek 2	U	3/4, 4/10	1	All known nests empty. No eagles seen.
West Clear Creek 3	U	3/4, 4/10	1	All known nests empty. No eagles seen.

<sup>1</sup> Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed, -- =undetermined.

\*Indicates a new breeding area was confirmed.

## HISTORIC BREEDING AREAS

Of the 25 historic BAs surveyed, occupancy was confirmed at nine of the sites (Table 5). Among the occupied sites, seven were active. When these breeding attempts were last observed, two were still considered active and five had failed. A single golden eagle was observed at one other site indicating possible occupancy, but did not satisfy the criteria for designation as an occupied BA.

### Apache County

*180 Powerline.* – On March 4, a golden eagle was observed perched on a power line tower but no nests were found.

*Heaps Tree.* – On April 9, a red-tailed hawk was incubating in nest #2.

### Cochise County

*Dos Cabezas Mountains.* – No nests were found and no golden eagles were observed on March 4. The site was not visited again, thus the breeding status was undetermined.

### Coconino County

*Glen Canyon.* – A golden eagle was incubating in nest #1 on April 8. The nest was not found on May 2, and was empty on June 2.

*Loco Point.* – A golden eagle was incubating in nest #2 on April 8. Two nestlings were observed at 2-3 weeks old on May 2, and at about 7 weeks old on June 2.

*Shinarump Cliffs.* – One golden eagle nestling was observed at 1-2 weeks old in nest #1 on April 8. Two nestlings were observed at 4-5 weeks old on May 2. The nest was empty on June 2.

*Top Rock.* – A golden eagle was incubating in nest #2 on April 8. Two adults were observed with one nestling at 1-2 weeks old on May 2. However the nest was empty on June 2.

### Graham County

*Gila Peak.* – A pair of golden eagles was observed on February 24, and one was performing an undulating flight display. Up to eight nests were found during a visit on April 3, but all of them were either in poor or fair condition and no eagles were observed.

*Javelina Peak.* – A golden eagle was incubating in a new cliff nest (#3) on April 3, however the nest was empty on May 23. A second new nest (#4) was also found.

*Weber Peak.* – A golden eagle was incubating in nest #3 on February 24 and April 2 (Figure 4), however the nest was empty on May 23.

### Greenlee County

*Bear Canyon.* – A golden eagle was incubating in nest #1 on April 3 (Figure 4), however the nest was empty on May 23.

Mohave County

*Yellowstone Mesa.* – One golden eagle was observed on April 8, and a red-tailed hawk was incubating nearby on May 2.

Navajo County

*The Canal.* – A pair of golden eagles was observed on March 3. However nest #1 and #2 were empty and there were no eagles on April 9.



Figure 4. Weber (left) and Bear Canyon (right) breeding areas. Photos by Kurt Licence.

Table 5. Summary of findings at historic breeding areas surveyed in 2014.			
Breeding Area	Status <sup>1</sup>	Dates surveyed	Comments
<b>Apache County</b>			
180 Powerline	--	3/4	No nests found. One golden eagle.
Heaps Tree	U	3/4, 4/9	Red-tailed hawk incubating in nest #2 on 4/9.
<b>Cochise County</b>			
Dos Cabezas Mountains	--	2/26	No nests found. No eagles seen.
Old Horseshoe Canyon	U	2/25, 4/4	No nests found. No eagles seen.
Red Bird Hills	U	2/26, 4/1	All known nests empty. No eagles seen.
<b>Coconino County</b>			
Glen Canyon	F	4/8, 5/2, 6/2	Incubating in nest #1 on April 8. Nest not found on May 2. Nest empty on June 2.
Loco Point	A	4/8, 5/2, 6/2	Incubating in nest #2 on 4/8. Two nestlings seen on 5/2 and 6/2.
Shinarump Cliffs	A	4/8, 5/2, 6/2	One nestling, 1-2 weeks old in nest #1 on April 8. Two nestlings, 4-5 weeks old on May 2. Nest empty on June 2.
Suicide Ridge	U	4/8, 5/2	All known nests empty. No eagles seen.
Top Rock	F	4/8, 5/2, 6/2	Incubating in nest #3 on 4/8. One nestling, 1-2 weeks old on 5/2. Nest empty on 6/2.
<b>Gila County</b>			
Coon Creek	U	3/6, 4/11	No nests found. No eagles seen.
<b>Graham County</b>			
Big Spring Canyon	U	2/24, 4/2	All known nests empty. No eagles seen.
Gila Peak	O	2/24, 4/3	All known nests empty. Pair of golden eagles on 2/24.
Javelina Peak	F	4/3, 5/23	Incubating in new nest #3 on 4/3. Nest empty on 5/23.

<sup>1</sup> Breeding area status codes: O=occupied, A=active, U=unoccupied, -- =undetermined.

Table 5 continued.			
Breeding Area	Status <sup>1</sup>	Dates surveyed	Comments
Markham Creek	U	2/24, 4/3	All known nests empty. No eagles seen.
Tollgate Canyon	U	2/24, 4/2	All known nests empty. No eagles seen.
Weber	F	2/24, 4/2, 5/23	Incubating in nest #3 on 2/24 and 4/2. Nest empty on 5/23.
<b>Greenlee County</b>			
Bear Canyon	F	2/24, 4/3, 5/23	Incubating in nest #1 on 4/3. Nest empty on 5/23.
Black Hills	U	2/24, 4/3	All known nests empty. No eagles seen.
Twin Peaks	U	2/24, 4/3	One golden eagle on 2/24 and 4/3. All known nests empty.
<b>Mohave County</b>			
Yellowstone Mesa	U	4/8, 5/2	One golden eagle on 4/8. Red-tailed hawk incubating on May 2.
<b>Navajo County</b>			
Cottonwood Wash	U	3/3, 4/9	All known nests empty. No eagles seen.
Pink Cliff	U	3/3, 4/9	No nests found. No eagles seen.
The Canal	O	3/3, 4/9	All known nests empty. Pair of golden eagles on 3/3.
Woodruff Ditch	U	3/3, 4/9	All known nests empty. No eagles seen.

<sup>1</sup> Breeding area status codes: O=occupied, A=active, U=unoccupied, -- =undetermined.

#### BREEDING AREAS

Of the 78 breeding areas surveyed, occupancy was confirmed at 32 sites (Table 6). Among the occupied sites, 29 were active. When these breeding attempts were last observed, three were successful, 16 were still active, and ten had failed. A single golden eagle was observed at nine other sites indicating possible occupancy, but did not satisfy the criteria for designation as an occupied BA.

#### Apache County

*Dutch.* – On March 4 a golden eagle was incubating in nest #1. Two nestlings were observed at two weeks old on April 9, and on May 19 the Department banded the nestlings and fitted them with backpack satellite transmitters. Satellite data indicated both young successfully fledged.

*Mesa Redonda.* – On March 4 and April 9, a golden eagle was incubating in nest #2.

#### Cochise County

*Engine Mountain.* – On February 25 and April 4 a golden eagle was incubating in nest #1. One nestling was observed at 7 weeks old on May 23.

*Maverick.* – On April 3, a golden eagle was observed flying.

*Orange Butte.* – A pair of golden eagles was observed on February 25. Two new cliff nests (#2 and #3) were found on April 4.

*Peloncillo Mountains.* – On February 25 and April 4 a golden eagle was incubating in nest #3 (Figure 5). One nestling was observed at 6-7 weeks old on May 23.

*Severin Canyon.* – On February 26, a golden eagle was observed perched.

#### Coconino County

*Aubrey Cliffs 1.* – During a ground visit on March 26, a pair of unidentified raptors was observed flying and perched near nest #2. However there was no good vantage point to view the nest and the breeding status was undetermined. On May 8, nests #1 and #2 were empty.

*Grapevine 3.* – Two golden eagle nestlings were observed at 6.5-7 weeks old on May 21 (Figure 5). The Department banded both nestlings and fitted them with backpack satellite transmitters on May 28. Satellite data indicated both young successfully fledged.

*Johnson Spring.* – A golden eagle was incubating in nest # 3 on April 8, but the nest was empty on May 2.



Figure 5. Peloncillo Mountains (left) and Grapevine 3 (right) breeding areas. Photos by Kurt Licence.

#### Gila County

*Haigler Creek.* – On March 5 a golden eagle was incubating in nest #1, however the nest was empty on April 11.

*Hardscrabble Canyon 1.* – An adult golden eagle was observed with one very small nestling in a new cliff nest (#2) on April 10. The nestling was 5-6 weeks old on May 21.

*Houston Creek.* – On March 5 a golden eagle was incubating in nest #2, however the nest was empty on April 11.

*Oak Spring Canyon.* – On March 5 a golden eagle was incubating in nest #3. An adult was observed feeding two hatchlings on April 11 (Figure 6), however the nest was empty on May 21.

*Parker Creek.* – On March 6 and April 11 a golden eagle was incubating in nest #5. One nestling was observed at 3.5 weeks old on May 21.

*Potato Butte.* – Nest #1 was not observed during multiple helicopter passes on March 5 and April 11, and the breeding status was undetermined.

Graham County

*Garden Spring Canyon.* – On February 25 a golden eagle was incubating in nest #1 (Figure 6), however the nest was empty on April 2. Two new large cliff nests were found (#5 and #6).

*O-Bar-O.* – A golden eagle was incubating in nest #3 on April 1, and one nestling was observed at 7.5 weeks old on May 23.

*Pinaleno I.* – On February 26 a golden eagle was observed.



Figure 6. Oak Spring Canyon (left) and Garden Spring Canyon (right) breeding areas. Photos by Kurt Licence.

Maricopa County

*Boulder Creek.* – On April 11 a golden eagle was incubating in nest #2.

Mohave County

*Aubrey Peak Wilderness.* – On April 2 a golden eagle was incubating in a cliff nest, however the nest was empty on May 6.

*Black Mtns West.* – On April 21 and May 8, there were 10-12 nests found, and one golden eagle was perched near nest #4 on April 21. The site was considered unoccupied, however the area was a difficult one to survey via fixed wing aircraft.

*Black Mtns 3.* – On March 25 a golden eagle was incubating in nest #1. An adult was sitting in the nest on May 8 but it could not be determined if young were present. The nest was empty on June 2.

*Black Mtns 15.* – On April 21 two small golden eagle nestlings were observed in nest #2. Only one nestling was present at 4-5 weeks old on May 8. The nestling was 7.5-8 weeks old on June 2.

*Black Mtns 24.* – On March 19 a golden eagle was incubating in nest #3. One nestling was observed at 6-7 weeks old on May 7. The nest was empty on June 2, but it could not be determined whether the nestling had successfully fledged or the nesting attempt failed.

*Boriana Canyon.* – Nest #2 was not found during visits on April 21 and May 8, and the breeding status was undetermined.

*Burro Cliffs.* – On April 3 a golden eagle was incubating in nest #1. One nestling was observed at 5-6 weeks old on May 9. The nest was empty on June 2, but it could not be determined whether the nestling had successfully fledged or the nesting attempt failed.

*Burro Creek Wilderness 1.* – On March 27 a new cliff nest (#3) was found.

*Elephant Mountain.* – A pair of golden eagles was observed on March 3 feeding on a carcass 4.5 miles from the nest area, but they were not definitively associated with the site. All known nests were empty.

*Hualapai South.* – On March 5 a golden eagle was incubating in nest #1. One nestling was noted as approximately 6-7 weeks old on May 8, and at over 8 weeks old on June 2.

*Long Mountain.* – A pair of golden eagles was observed flying and perched during a ground survey on March 24, but nest #1 and #2 were not observed. On May 2 a pair of golden eagles was again soaring, and nests #1 and #2 were empty.

*Trout Creek.* – On March 4 a golden eagle was observed flying.

#### Mohave County

*Black Rock Spring.* – On April 10 a golden eagle was observed.

#### Yavapai County

*Deadman Creek.* – On April 11 a golden eagle was incubating in nest #1. Strong winds prevented an effective aerial survey on May 21, and the status of the nest attempt was not determined.

*Burro Mesa.* – One golden eagle nestling was observed in nest #3 at about three weeks old on May 9, and 7-7.5 weeks old on June 2.

*Cypress Mountain.* – On April 21 a golden eagle was observed soaring and perched, but nest #1 was not observed and the breeding status was undetermined. The nest was empty on May 9.

*East Cedar Mountain.* – On March 5 a golden eagle was incubating in nest #1, and an adult was observed with a very small nestling on April 10 (Figure 7).

*Granite.* – On March 13 a golden eagle was incubating in nest #1 (Figure 7), and an adult was observed with a small nestling on April 17. The nestling was 4.5 weeks old on May 9.

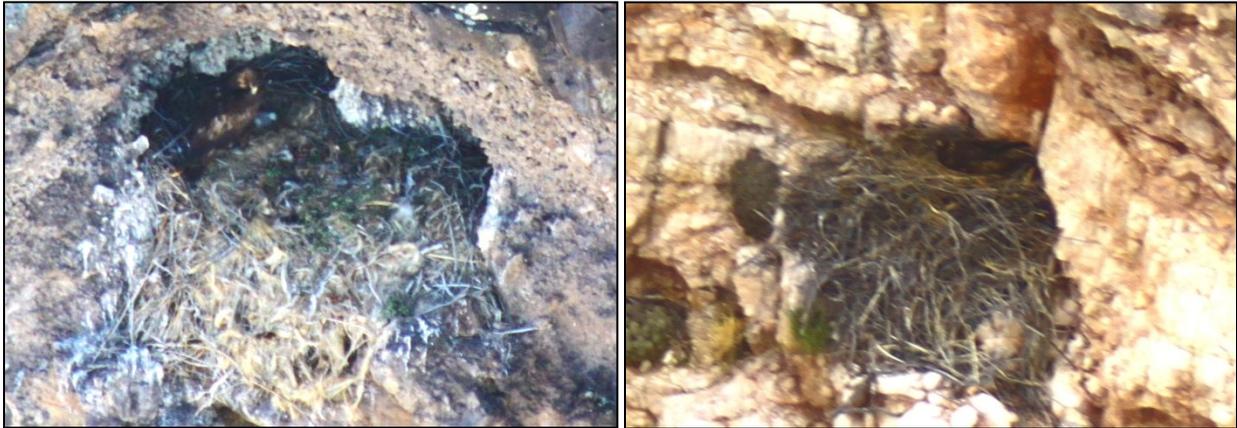


Figure 7. East Cedar Mountain (left) and Granite (right) breeding areas. Photos by Kurt Licence.

*Juniper Mountains 2.* – On April 21 a golden eagle was incubating in nest #1. The nest was empty on May 8.

*Juniper Mountains 3.* – On May 8 one golden eagle nestling was observed in nest #1 at 2-3 weeks old, and at approximately 7.5 weeks old on June 2.

*Little Lime Creek.* – On April 10 a golden eagle was incubating in nest #2.

*McCloud Mountains.* – On February 24 a golden eagle was observed flying.

*Mormon Pocket.* – On March 13 a golden eagle was incubating in nest #2, however the nest was empty on April 17.

*Peoples Canyon.* – A pair of golden eagles was observed soaring and perching near nest #2 February 24.

Table 6. Summary of findings at known breeding areas surveyed in 2014.			
Breeding Area	Status <sup>1</sup>	Dates surveyed	Comments
<b>Apache County</b>			
Dutch	S	3/4, 4/9, 5/19	Incubating in nest #1 on 3/4. Two nestlings, two weeks old on 4/9. Two nestlings, 7.5 weeks old on 5/19.
LCR Lyman Lake	U	3/4, 4/9	All known nests empty. No eagles seen.
Mesa Redonda	A	3/4, 4/9	Incubating in nest #2 on 3/4 and 4/9.
Nutriosio Creek	U	3/4, 4/9	Almost nothing left of nest #1. No eagles seen.
Wolf Mountain	U	3/4, 4/9	All known nests empty. No eagles seen.
Ziegler Mountain	U	3/4, 4/9	All known nests empty. No eagles seen.
<b>Cochise County</b>			
Engine Mountain	A	2/25, 4/4, 5/23	Incubating in nest #1 on 2/25 and 4/4. One nestling, 7 weeks old on 5/23.
Maverick	U	2/26, 4/3	All known nests empty. One golden eagle on 4/3.
Orange Butte	O	2/25, 4/4	All known nests empty. Pair of golden eagles on 2/25.

<sup>1</sup>Breeding area status codes: O=occupied, A=active, U=unoccupied, -- =undetermined.

Table 6 continued.			
Breeding Area	Status <sup>1</sup>	Dates surveyed	Comments
Peloncillo Mountains	A	2/25, 4/4, 5/23	Incubating in nest #3 on 2/25 and 4/4. One nestling, 7 weeks old on 5/23.
Severin Canyon	U	2/26, 4/1	All known nests empty. One golden eagle on 2/26.
Square Mountain	U	2/26, 4/1	All known nests empty. No eagles seen.
<b>Coconino County</b>			
Aubrey Cliffs 1	--	3/26, 5/8	Two raptors on 3/26. All known nests empty on 5/8.
Big Bud Tank	U	3/26, 5/8	All known nests empty. No eagles seen.
Canyon Diablo	U	3/11, 5/2	All known nests empty. No eagles seen.
Chevelon Canyon	U	3/3, 4/10	Four large empty nests were found on April 10.
Grapevine 3	S	5/21, 5/28	Two nestlings 6.5-7 weeks old in nest #2 on 5/21. Two nestlings 7.5-8 weeks old on 5/28.
Johnson Spring	F	4/8, 5/2	Incubating in nest #3 on 4/8. Nest empty on May 2.
Red Mountain	U	3/10, 5/2	One large nest found. No eagles seen.
<b>Gila County</b>			
Ash Mountain	U	3/6, 4/11	All known nests empty. No eagles seen.
Deadman Mesa	U	2/3, 4/10	All known nests empty. No eagles seen.
Haigler Creek	F	3/5, 4/11	Incubating in nest #2 on 3/5. Nest empty on 4/11.
Hardscrabble Canyon 1	A	3/4, 4/10, 5/21	One very small nestling in new nest #2 on 4/10. One nestling 5-6 weeks old on 5/21.
Hess Canyon	U	1/7, 2/4, 3/6, 4/16	All known nests empty. No eagles seen.
Houston Creek	F	3/5, 4/11	Incubating in nest #2 on 3/5. Nest empty on 4/11.
Moody Point	U	3/6, 4/11	All known nests empty. No eagles seen.
Oak Spring Canyon	F	3/5, 4/11, 5/21	Incubating in nest #3 on 3/5. Two nestlings 1-2 weeks old on 4/11. Nest empty on 5/21.
Parker Creek	A	3/6, 4/11, 5/21	Incubating in nest #5 on 3/6 and 4/11. One nestling, 3.5 weeks old on 5/21.
Pine Creek 2	U	3/4, 4/10	All known nests empty. No eagles seen.
Pinto Creek	--	4/24	All known nests empty. No eagles seen.
Potato Butte	U	3/5, 4/11	No nests found. No eagles seen.
<b>Graham County</b>			
Blue Ridge	U	2/25, 4/2	All known nests empty. One golden eagle on 4/2.
Bryce Mountain	U	2/24, 4/2	All known nests empty. No eagles seen.
Garden Spring Canyon	F	2/25, 4/2	Incubating in nest #1 on 2/25. Nest empty on 4/2.
Gila Mountains Central	U	2/24, 4/3	All known nests empty. No eagles seen.
O-Bar-O	A	2/26, 4/1, 5/23	Incubating in nest #3 on 4/1. One nestling, 7.5 weeks old on 5/23.
Pinaleno 1	U	2/26, 4/1	All known nests empty. One golden eagle on 2/26.
Pinaleno 2	U	2/26, 4/1	Red-tailed hawk incubating in nest #2 on 2/26.
Santa Teresa	U	2/25, 4/2	All known nests empty. No eagles seen.
<b>Greenlee County</b>			
Hot Springs Canyon	U	2/24, 4/3	All known nests empty. No eagles seen.
<b>Maricopa County</b>			
Alchesay Canyon	U	2/4, 3/14, 4/16	All known nests empty. No eagles seen. New cliff nest #6 found.
Boulder Creek	A	3/5, 4/11	Incubating in nest #2 on 4/11.

<sup>1</sup>Breeding area status codes: O=occupied, A=active, U=unoccupied, -- =undetermined.

Table 6 continued.			
Breeding Area	Status <sup>1</sup>	Dates surveyed	Comments
<b>Mohave County</b>			
Aubrey Peak Wilderness	F	4/1, 4/2, 5/6, 5/9	Incubating on April 2. Nest empty on 5/6.
Black Mtns West	U	4/21, 5/8	All known nests empty. One golden eagle on April 21.
Black Mtns 3	F	3/25, 5/8, 6/2	Incubating in nest #1 on 3/25. Incubating or brooding on May 8. Nest empty on 6/2.
Black Mtns 15	A	4/21, 5/8, 6/2	Two small nestlings in nest #2 on 4/21. One nestling, 4-5 weeks old on 5/8 and 7.5-8 weeks old on 5/21.
Black Mtns 24	A	3/19, 5/7, 6/2	Incubating in nest #3 on 3/19. One nestling, 6-7 weeks old on 5/7. Nest empty on 6/2.
Boriana Canyon	--	3/19, 4/21, 5/8	Nest #3 empty. Nest #2 not found. No eagles seen.
Burro Cliffs	A	4/3, 5/9, 6/2	Incubating in nest #1 on 4/3. One nestling, 5-6 weeks old on 5/9. Nest empty on 6/2.
Burro Creek Wilderness 1	U	3/27, 5/9	All known nests empty. No eagles seen. New nest #3 found.
Elephant Mountain	U	3/3, 5/9	All known nests empty.
Grand Wash North 2	U	4/10, 5/8	All known nests empty. No eagles seen.
Hualapai South	S	3/5, 5/8, 6/2	Incubating in nest #1 on March 5. One nestling on 5/8 and 6/2.
Long Mountain	O	3/24, 5/8	Pair of golden eagles seen on 3/24 and 5/8.
Trout Creek	U	3/4, 5/8	All known nests empty. One golden eagle on 3/4.
<b>Navajo County</b>			
Black Rock Spring	U	3/3, 4/10	All known nests empty. One golden eagle on 4/10.
Chevelon-Rock Creek	U	3/3, 4/10, 5/21	Probable common raven nestlings in nest #1 on 5/21.
Clear Creek	U	3/3, 4/10	All known nests empty. No eagles seen.
Corbet Tank	U	3/3, 4/10	All known nests empty. No eagles seen.
<b>Pima County</b>			
Waterman Mountains	U	2/27, 3/31	All known nests empty. No eagles seen.
<b>Pinal County</b>			
Table Mountain	U	2/25, 4/2	All known nests empty. No eagles seen.
<b>Yavapai County</b>			
Burro Mesa	A	4/21, 5/9, 6/2	One nestling, 3 weeks old on 5/9. One nestling, 7.5 weeks old on 6/2.
Cherry Creek	A	2/18, 5/2	Incubating in nest #1 on 2/18. Nest empty on 5/2.
Cypress Mountain	--	4/21, 5/9	One golden eagle on 4/21. Nest #1 empty on May 9.
Deadman Creek	A	3/5, 4/11, 5/21	Incubating in nest #1 on 4/11. Status not confirmed on 5/21.
East Cedar Mountain	A	3/5, 4/10	Incubating in nest #1 on 3/5. One small nestling on 4/10.
Granite	A	1/6, 2/3, 3/13, 4/17, 5/9	Incubating in nest #1 on 3/13. One small nestling on 4/17. One nestling, 4.5 weeks old on 5/9.
Hell Point	U	1/6, 2/3, 3/13, 4/17	All known nests empty. No eagles seen.
Juniper Mountains 2	F	4/21, 5/8	Incubating in nest #1 on 4/21. Nest empty on May 8.
Juniper Mountains 3	A	5/8, 6/2	One golden eagle nestling on 5/8 and 6/2.
Little Lime Creek	A	3/5, 4/10	Incubating in nest #2 on 4/10.

<sup>1</sup>Breeding area status codes: O=occupied, A=active, U=unoccupied, -- =undetermined.

Table 6 continued.			
Breeding Area	Status <sup>1</sup>	Dates surveyed	Comments
McCloud Mountains	--	2/24	One golden eagle on 2/24.
Midnight Mesa	U	3/5, 4/10, 5/21	All known nests empty. No eagles seen.
Mormon Pocket	F	1/6, 2/3, 3/13, 4/17	Incubating in nest #2 on 3/13. Nest empty on 4/17.
Peoples Canyon	O	2/21, 2/24, 5/9	A pair of golden eagles was seen on 2/24.
South Butte	U	4/21, 5/8	All known nests empty. No eagles seen.
Watson Lake	U	3/13, 5/9	All known nests empty. No eagles seen.

<sup>1</sup>Breeding area status codes: O=occupied, A=active, U=unoccupied, -- =undetermined.

#### ADDITIONAL GOLDEN EAGLE SIGHTINGS

During the 2014 occupancy and nest surveys, 6 sightings of golden eagles were documented that were not associated with a nest area (Table 7).

Table 7. Summary of additional golden eagle sightings in 2014.			
Location name	Date	Number of Eagles	Comments
<b>Apache County</b>			
Flat Top	3/4	1	Immature perched and flying.
Zuni River	3/4	1	Adult perched at small buttes near river, no nests found.
<b>Coconino County</b>			
Clear Creek (Hamilton Crossing)	3/3	1	Immature soaring.
<b>Gila County</b>			
Haystack	3/6	1	Adult perched.
<b>Navajo County</b>			
Clear Creek	3/3	1	Adult flying over grassland.
Silver Creek	4/9	1	Adult perched, flushed.

#### OVERVIEW

Surveys of 97 known and historic BAs confirmed 41 (42.3%) were occupied. Of 141 potential BAs surveyed, 25 (17.7%) were confirmed occupied. A database of large nests was established for a wide area of the state with survey data collected in 2011-2014. Currently, there are 222 known golden eagle BAs, 46 historic BAs and 404 potential BAs in Arizona, excluding those that occur on Native American lands (Figure 8, Table 8).

Management of golden eagle populations is being evaluated by USFWS using Bird Conservation Regions (BCRs). Arizona is approximately divided in thirds by BCR 16 (Southern Rockies/Colorado Plateau), 33 (Sonoran and Mohave Deserts), and 34 (Sierra Madre Occidental) (NABCI 2000). A small portion of BCR 35 (Chihuahuan Desert) is represented as well. Surveys in 2014 occurred in all four BCRs. Excluding Native American lands, the total number of known BAs, potential BAs, and large nests is greatest in BCR 34 (Table 8).

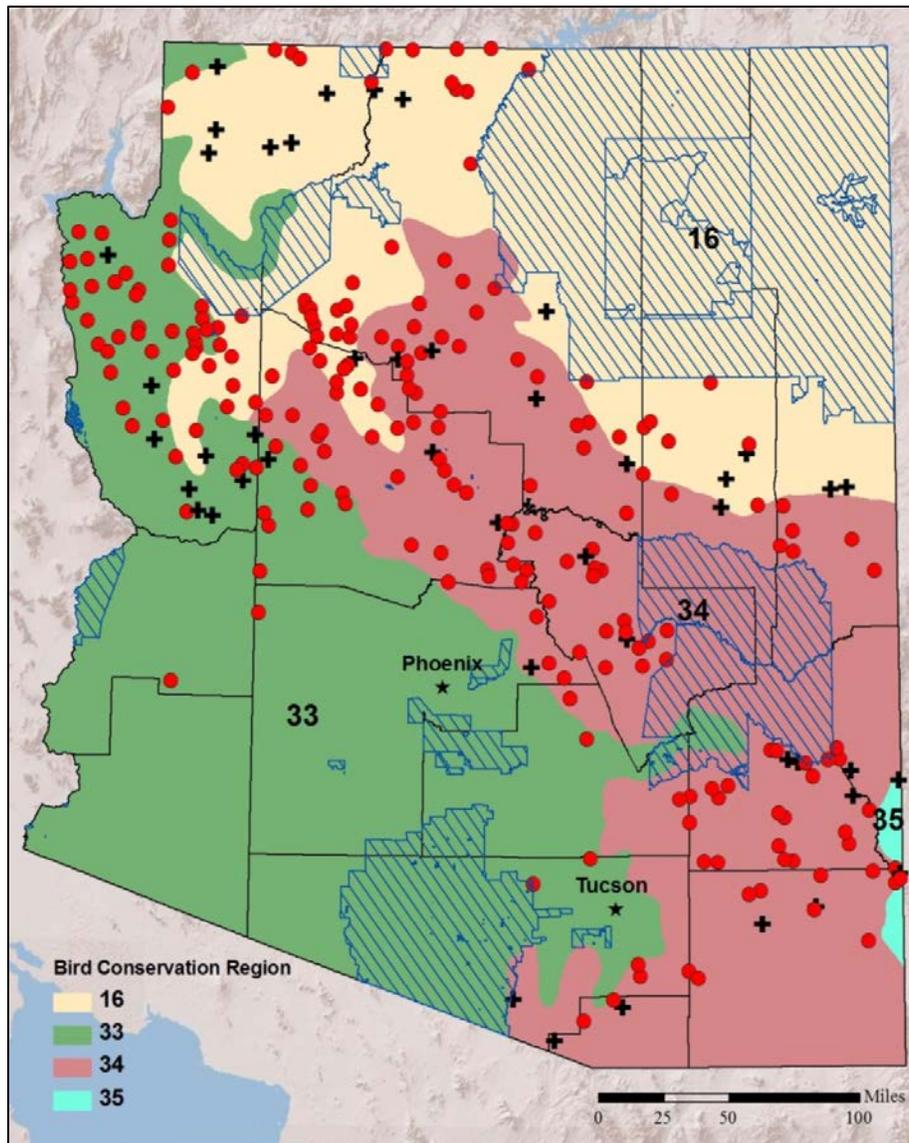


Figure 8. Distribution of current (red circles) and historic (black crosses) golden eagle breeding areas in Arizona as of 2014. Breeding areas are not shown on Native American lands (blue shaded). County lines in black.

Table 8. Number of known golden eagle breeding areas (BAs), historic BAs, potential BAs, and large nests in Arizona by Bird Conservation Region (BCR) as of 2014.				
BCR number	BAs	Historic BAs	Potential BAs	Large Nests
16	56*	14	61	96
33	52	11	144	278
34	113	20	197	334
35	1	1	2	8
Total	222	46	404	716

\*Includes one breeding area shared between BCR 16 and 33.

#### MANAGEMENT RECOMMENDATIONS

1. Future aerial nest surveys should focus on unsurveyed suitable breeding habitat and historic BAs within 10 miles of proposed wind and solar projects.
2. Future nest survey efforts should also focus on unsurveyed segments of suitable habitat within each of Arizona's three main BCR's.
  - a. In BCR 16, the Grand Wash Cliffs north of Grand Canyon, upper Parashant and Andrus Canyons, Kanab Creek and tributaries, Kaibab Plateau, Saddle Mountain Wilderness Area, Marble Canyon, Grand Canyon National Park.
  - b. In BCR 33, Department of Defense lands not covered by AGFD Wildlife Contracts Branch in 2013-2014, Organ Pipe National Monument, and Kofa and Cabeza Prieta National Wildlife Refuges.
  - c. In BCR 34, portions of the Superstition Wilderness, southern Tonto National Forest, Chiricahua Mountains, Mule Mountains, and Coronado National Forest (except those areas already surveyed).
3. Obtain access to Tribal and Department of Defense lands to conduct golden eagle nest surveys in those areas.
4. Continue to re-visit potential BAs in order to document occupancy by golden eagles. Highest priority for occupancy surveys include areas where a single golden eagle was found near a large nest, and those areas with multiple large nests in fair to good condition.
5. A representative sample of BA's should be monitored for productivity within each BCR.

LITERATURE CITED

- Braun, C.E., F. Hamerstrom, T. Ray, and C.M. White. 1975. Conservation committee report on status of eagles. *Wilson Bulletin* 87:140-143.
- Brown, D.E. (Ed.). 1994. *Biotic Communities, Southwestern United States and Mexico*. The University of Utah Press. Salt Lake City.
- Corman, T.E. and C. Wise-Gervais (Eds.). 2005. *Arizona Breeding Bird Atlas*. Albuquerque, NM: University of New Mexico Press,
- Driscoll, D.E. 2010. Protocol for golden eagle occupancy, reproduction, and prey population assessment. American Eagle Research Institute, Apache Junction, AZ.
- Eakle, W.L., and T.G. Grubb 1986. Prey remains from golden eagle nests in central Arizona. *Western Birds* 17: 87-89.
- Good, R.E., R.M. Nielson, H.H. Sawyer, and L.L. McDonald. 2004. Population level survey of Golden Eagles (*Aquila chrysaetos*) in the western United States. Report prepared for U.S. Fish and Wildlife Service. Western EcoSystems Technology, Inc., Cheyenne, WY.
- Good, R.E., R.M. Nielson, H.H. Sawyer, and L.L. McDonald. 2007. A population estimate for golden eagles in the western United States. *Journal of Wildlife Management* 71:395-402.
- Grubb, T.G., and W.L. Eakle. 1987. Comparative morphology of bald and golden eagle nests in Arizona. *J. Wildlife Management* 51:744-748.
- Hoechlin, D.R. 1976. Development of golden eaglets in southern California. *Western Birds* 7:137-152.
- Kochert, M.N., and K. Steenhof. 2002. Golden eagles in the U.S. and Canada: Status, trends, and conservation challenges. *Journal of Raptor Research* 36:32-40.
- Kochert, M.N., K. Steenhof, C.L. McIntyre, and E.H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). In *The Birds of North America*, No. 684 (A. Poole and F. Gill, Eds.). The Birds of North America, Inc., Philadelphia, PA.
- McCarty, K.M., and K.V. Jacobson. 2010. Arizona bald eagle management program 2010 summary report. Nongame and Endangered Wildlife Program Technical Report 261. Arizona Game and Fish Department, Phoenix, Arizona.
- McCarty, K.M., and K.V. Jacobson. 2011. Arizona golden eagle nest survey 2011. Nongame and Endangered Wildlife Program Technical Report 267. Arizona Game and Fish Department, Phoenix, Arizona.

- McCarty, K.M., and K.V. Jacobson. 2012. Arizona golden eagle nest survey 2012. Nongame and Endangered Wildlife Program Technical Report 271. Arizona Game and Fish Department, Phoenix, Arizona.
- McCarty, K.M., K.L. Licence, and K.V. Jacobson. 2013. Arizona golden eagle nest survey 2013 summary report. Nongame and Endangered Wildlife Program Technical Report 277. Arizona Game and Fish Department, Phoenix, Arizona.
- McIntyre, C.L. 2002. Patterns in nesting area occupancy and reproductive success of golden eagles (*Aquila chrysaetos*) in Denali National Park and Preserve, Alaska, 1988-99. *Journal of Raptor Research*. 36:50-54.
- Millsap, B.A. 1981. Distributional status of Falconiformes in west central Arizona, with notes on ecology, reproductive success, and management. U.S. Dept. Interior, Bureau of Land Management Technical Note 355.
- Millsap, B.A., G.S. Zimmerman, J.R. Sauer, R.M. Nielson, M. Otto, E. Bjerre, and R. Murphy. 2013. Golden eagle population trends in the western United States: 1968-2010. *Journal of Wildlife Management*. 77(7):1436-1448.
- NABCI. 2000. North American Bird Conservation Initiative. Bird Conservation Region descriptions. A supplement of the North American Bird Conservation Initiative Bird Conservation Regions Map.
- Nielson, R. M., L. McManus, T. Rintz, and L. L. McDonald. 2013. A survey of golden eagles (*Aquila chrysaetos*) in the western U.S.: 2013 Annual Report. A report for the U.S. Fish & Wildlife Service. WEST, Inc., Cheyenne, Wyoming
- Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. Suggested practices for raptor protection on power lines: the state of the art in 1981. Raptor Research Report No. 4, Raptor Research Foundation, Inc., St. Paul, MN.
- Postupalsky, S. 1974. Raptor reproductive success: some problems with methods, criteria, and terminology. In F.N. Hamerstrom, B.E. Harrell and R.R. Olendorff, Eds. Management of raptors. Proceedings of the conference on raptor conservation techniques. Raptor Research Report 2:21-31. Raptor Research Foundation, Inc., Vermilion, SD.
- Postupalsky, S. 1983. Techniques and terminology for surveys of nesting bald eagles. Appendix D in J.W. Grier and others, Eds. Northern States bald eagle recovery plan. U.S. Dept. Interior, U.S. Fish and Wildlife Service, Twin Cities, MN.
- Steenhof, K. and M.N. Kochert. 1982. An evaluation of methods used to estimate raptor nesting success. *Journal of Wildlife Management*. 46(4):885-893.

- Sturla, D.P., M.D. Piorkowski, and J.M. Diamond. 2014a. Golden eagle nest surveys on the Barry M. Goldwater Range in southern Arizona. Final report. Arizona Game and Fish Department, Wildlife Contracts Branch, Phoenix, Arizona, USA.
- Sturla, D.P., M.D. Piorkowski, and J.M. Diamond. 2014b. Planning level surveys to determine the distribution and nesting status of golden eagles on Yuma Proving Ground in southwestern Arizona. Final report submitted to U.S. Army Yuma Proving Ground. Arizona Game and Fish Department, Wildlife Contracts Branch, Phoenix, Arizona, USA.
- Watson, J. 1997. *The Golden Eagle*. Bath: The Bath Press.
- U.S. Fish and Wildlife Service. 2007a. Protection of eagles; definition of “disturb”. Final rule. Federal Register. 72(107):31132-31140. Department of the Interior, Washington, D.C.
- U.S. Fish and Wildlife Service. 2007b. Endangered and threatened wildlife and plants; removing the bald eagle in the lower 48 states from the list of endangered and threatened wildlife; final rule. Federal Register. 72(130):37346-37372. Department of the Interior, Washington, D.C.
- U.S. Fish and Wildlife Service. 2009. Eagle permits; take necessary to protect interests in particular localities; final rule. Federal Register. 74(175):46836-46879. Department of the Interior, Washington, D.C.

APPENDIX A: RAPTOR REPRODUCTIVE STATUS CRITERIA

**Breeding Area (BA):** An area containing one or more nests within the range of one mated pair of birds. Operationally, once a BA is established, we consider it a BA whether it is occupied by eagles in a given year or not, until or unless it is designated historical (i.e., 10 consecutive years unoccupied).

**Historic BA:** A BA documented as having been unoccupied for ten consecutive years prior to the current year.

**Occupied BA:** An occupied BA must have a nest, which is any nest, where at least one of the following activity patterns was observed during the breeding season:

- a. Young were raised.
- b. Eggs were laid.
- c. One adult sitting low in the nest, presumably incubating.
- d. Two adults present on or near the nest.
- e. One adult and one bird in immature plumage at or near a nest, if mating behavior was observed (display flight, nest repair, copulation).
- f. A recently repaired nest with fresh sticks, or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath.

**Active Nest:** One in which eggs have been laid. Activity patterns (a), (b), and (c) above are diagnostic of an active nest.

**Unoccupied BA:** A nest or group of alternate nests at which none of the activity patterns diagnostic of an occupied nest were observed in a given breeding season. BAs must exist as occupied before they can be recognized and classified as unoccupied.

**Successful nest:** An active nest from which at least one young fledged during the breeding season under consideration. Nests were successful if at least one young was raised past 80% of fledging age.

**Failed nest:** An active nest from which no young fledged regardless of cause.

**Productivity:** The number of young fledged per occupied BA.

APPENDIX B: AREAS SURVEYED IN 2014.

Table 9. Summary of survey areas and survey time in 2014.		
Date	Time (min)	Areas surveyed <sup>1</sup>
2/24	270	Apache National Forest, Eagle Creek, Gila Mountains.
2/25	432	Aravaipa Canyon; Galiuro, Peloncillo, Santa Teresa, and Whitlock Mountains.
2/26	336	Chiricahua, Dos Cabezas, Galiuro, Little Dragoon, Pinaleno, and Winchester Mountains; Red Bird Hills.
2/27	252	Coronado National Forest; Little Rincon, Picacho, Rincon, Santa Catalina, Sawtooth, Silver Bell, Tortolita, and Waterman Mountains.
3/3	258	Black Canyon, Chevelon Creek, Clear Creek, Cottonwood Wash, Little Colorado River, Second Knolls, Silver Creek.
3/4	282	Apache-Sitgreaves National Forest, Coconino National Forest, Fossil Creek, Little Colorado River, Mesa Redonda, Stinking Springs Mountain, Tonto National Forest, West Clear Creek.
3/5	282	Agua Fria River, Mazatzal Mountains, New River Mountains, Sierra Ancha, Tonto Creek, Tonto National Forest.
3/6	312	Sierra Ancha, Salt River, Tonto National Forest.
3/31	156	Picacho, Sawtooth, Silver Bell, Tortolita, and Waterman Mountains.
4/1	300	Coronado National Forest; Galiuro, Little Rincon, and Winchester Mountains.
4/2	330	Gila and Peloncillo Mountains.
4/3	408	Chiricahua, Dos Cabezas, Galiuro, Gila, Peloncillo, and Whitlock Mountains.
4/4	324	Mt. Graham and Peloncillo Mountains.
4/9	246	Apache-Sitgreaves National Forest, Cottonwood Wash, Little Colorado River, Mesa Redonda, Second Knolls, Silver Creek.
4/10	372	Agua Fria River, Chevelon Creek, Clear Creek, Fossil Creek, New River Mountains, Tonto National Forest.
4/11	354	Mazatzal Mountains, Tonto Creek, Tonto National Forest.
4/24	372	Salt River Wilderness, Superstition Mountains.
4/25	315	Superstition Mountains.
5/21	294	Mazatzal Mountains, Salt River, Sierra Ancha, Tonto National Forest.
5/23	258	Galiuro, Gila, Peloncillo, and Santa Teresa Mountains.

APPENDIX C: NEW POTENTIAL BREEDING AREAS DOCUMENTED IN 2014

Table 10. Summary of new potential breeding areas with large nests documented in 2014.		
Area Name	Number of nests	Comments
<b>Apache County</b>		
Lyman	1	Nests in poor condition. On small rim cliff.
Milligan	1	Nests in poor condition. Lower set of cliffs.
<b>Cochise County</b>		
Chiricahua 1	2	Nests in fair condition. One nest medium size, but maybe large enough. One golden eagle perched.
Chiricahua 2	2	Nests in fair-poor condition. Up to four nests present.
Peloncillo Mountains 4	6	Nests mostly in fair condition, but two were good.
Peloncillo Mountains 5	3	Nests in poor-fair condition. Up to four nests present, two of which may be too small for eagles.
Winchester	1	Nest in fair condition.
<b>Gila County</b>		
Apache	2	Nests in fair-good condition.
Black Mesa	3	Nests in poor condition.
Butte Creek	1	Nest in poor condition. Upper cliffs.
Pinal Creek 1	2	Nests in fair condition.
Pinal Creek 2	1	None.
Redmond Mountain	1	Nest in poor-fair condition.
Richmond	1	Nest on open ledge on low cliff.
Rockinstraw	4	Nests in fair condition. One very large nest.
Timber	3	Nests in poor-fair condition. One nest very poor.
<b>Graham County</b>		
Arizona Gulch	1	Nest in fair condition. Eagle-sized.
Bonita	2	One nest in very poor condition.
Galiuro Mts 13	2	Nests in fair condition. One nest eagle-sized, one medium-large.
Peloncillo Mountains 6	3	Nests in poor-fair condition.
Pinaleno 5	2	One nest in fair-good condition, one poor.
Pinaleno 6	1	Nest in fair condition.
Pinaleno 7	1	Nest in poor condition.
Pinaleno 8	2	Nests in poor-fair condition.
Pinaleno 9	2	One nest in poor-fair condition, one fair-good.
Pinaleno 10	1	Nest in fair condition.
San Simon Valley 1	1	None.
Slick Rock	3	Nests in fair condition.
<b>Greenlee County</b>		
Hells Hole	2	Nests in fair condition. Two nests close together.
McMullen	1	Nest in fair condition.
Palace	2	Nests in poor-fair condition. Two nests close together.
<b>Maricopa County</b>		
Superstition 2	1	Nest in fair condition.
Superstition 3	2	Nests in fair-good condition. One very large nest looked recently used.
Superstition 4	5	Nests in poor-fair condition.
Superstition 7	2	None.
Superstition 8	2	Nests in poor-fair condition.
Superstition 11	1	Nest in very poor condition.
Two Bar	5	Nests in poor-fair condition.

Table 10 continued.		
Area Name	Number of nests	Comments
<b>Navajo County</b>		
Silver 1	2	Nests in poor-fair condition.
Silver 2	1	Nest in poor condition.
Silver 3	2	Nests in poor condition.
Silver 4	1	Nest in poor condition.
<b>Pima County</b>		
Arrowhead	1	Nest in fair condition. Red-tailed hawk incubating in nest on same wall.
Catalina 1	1	Nest in poor condition.
Martinez	1	Nest in good condition. One golden eagle.
<b>Pinal County</b>		
Haunted Canyon	1	Nest in poor -fair condition.
Superstition 5	1	Nest in poor condition.
Superstition 6	7	Nests in poor-fair condition.
Superstition 9	1	None.
Superstition 10	1	Nest in fair condition. One golden eagle.