

ARIZONA GOLDEN EAGLE NEST SURVEY 2013

Kyle M. McCarty, Bald Eagle Field Projects Coordinator
Kurt Licence, Birds and Mammals Technician
Kenneth V. Jacobson, Raptor Management Coordinator
Nongame Branch, Wildlife Management Division



Photo by Kurt Licence



Technical Report 277
Nongame and Endangered Wildlife Program
Nongame Branch Chief: Mike Rabe
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086

December 2013

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ACKNOWLEDGMENTS

The authors acknowledge and appreciate the assistance of the following people: Tim Hughes, U.S. Bureau of Land Management; Larry Gabriel, Borden Miller, Kenn Musselman, Dan Northrop, Heather Saur, and Joe Schlehuber, Papillon Airways Inc; Bill Burger, James Driscoll, Susan MacVean, and Dan Sturla, Arizona Game and Fish Department; Paul Whitefield, National Park Service; Allen Graber and Tom Koronkiewicz, SWCA; Laura Nagy, Tetra Tech; Rob Ackerman, John Knotts, and Ruth Valencia, Salt River Project; Alex Smith and Geoff Shanen, U.S. Bureau of Reclamation; Fred Wong and Roger Joos, U.S. Forest Service; Joel Thompson, WEST, Inc.

PROJECT FUNDING

Funding for this project was provided by the U.S. Bureau of Land Management, the Arizona Game and Fish Department's Heritage Fund, U.S. Fish and Wildlife Service (State Wildlife Grants), and U.S. Forest Service.

RECOMMENDED CITATION

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.

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INTRODUCTION

In 1940, Congress passed the Bald Eagle Protection Act in an effort to provide protection for declining bald eagle populations (*Haliaeetus leucocephalus*). In 1962, the Act was amended to include golden eagles (*Aquila chrysaetos*), becoming the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250). In addition to the BGEPA, golden eagles 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 BGEPA. Disturbance includes an action that “causes, or is likely to cause...injury to an eagle” or 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 BGEPA (USFWS 2009). For implementation of take permits to be compatible with the BGEPA (i.e., stable or increasing breeding populations) accurate population estimates are needed.

Few long-term studies have been undertaken on golden eagle populations in North America (Kochert and Steenhof 2002, Kochert et al. 2002). Braun et al. (1975) proposed 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. In 2003 the USFWS contracted with Western EcoSystems Technology, Inc. (WEST) to complete golden eagle aerial line transect surveys across much of the species' range in the western United States, with an estimated 27,392 golden eagles within the entire study area (Good et al. 2004, 2007). More recently, the surveys were expanded and repeated in 2006-2011, and estimates ranged from 18,858 to 24,206 total golden eagles within the study area (Nielson et al. 2012). Millsap et al. (2013) presented a composite analysis using the transect data in conjunction with Breeding Bird Survey data. Their results yielded similar population size estimates and further analyses indicated a generally stable population across the western U.S. over the past 40 years.

In Arizona, information on breeding golden eagles is limited. Studies have reported on golden eagle productivity in west-central Arizona (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. Additional data was gathered during a 2006 Arizona Game and Fish Department (AGFD) survey effort, which found 14 occupied nests among 85 surveyed locations that had been identified as historic or current breeding areas. The

2006 survey protocol, however, was limited to only 2 visits, in mid-April and mid-June, so occupancy-only and early failures were likely missed (AGFD unpublished data).

Intensive statewide nest surveys began in 2011, when the Bureau of Land Management (BLM) funded AGFD to conduct a two-year baseline inventory of potential nest sites primarily within and adjacent to proposed wind and solar energy project areas. In 2011-2012, AGFD surveyed suitable cliff-nesting golden eagle habitat via helicopter in western, northern, central, and southeastern Arizona, visiting 85 breeding areas (BAs) or historic BAs, and finding 67 new BAs and 305 potential BAs (McCarty and Jacobson 2011, 2012). Additional funding was provided by BLM for aerial occupancy surveys in 2013-2014 of known and potential BAs, and by the U.S. Forest Service (USFS) for a nest inventory in 2013 of the Tonto National Forest. This report covers the results of the 2013 surveys.

STUDY AREA

In 2013, helicopter surveys were conducted in portions of Coconino, Gila, Maricopa, Mohave, and Yavapai Counties (Figure 1). The effort included lands administered by the BLM and USFS and adjacent lands that contained proposed wind or solar energy development projects. These lands were often intermingled with private or state trust properties.



Figure 1. Aerial golden eagle occupancy and nest surveys completed in Arizona in 2013 showing raw flight tracks (black lines). County lines in white.

The survey area was diverse in habitat, characterized by nine biotic communities including Great Basin Conifer Woodland, Great Basin Desertscrub, Interior Chaparral, Madrean Evergreen Woodland, Mohave Desertscrub, 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). Elevations throughout the survey area ranged from 137 m (450 ft) at the Colorado River to 2,566 m (8,417 ft) in the Hualapai Mountains.

METHODS

Survey efforts in 2013 were focused on two objectives. First, some occupancy data was collected by returning to golden eagle BAs and potential BAs identified during the nest inventory completed in 2011-2012. Our sample of these nest sites was determined by considering the available flight time, location of airports for fueling, and choosing routes to maximize the number of nests visited. Two visits were scheduled at least 30 days apart, with the first timed to coincide with pre- and early-incubation behavior in late February to early March, and the second visit occurring in late March to early April. At some sites a third visit was scheduled in May in order to gather additional data on number of young hatched, and to document nest success or failure where appropriate. All known alternate nests were examined at each BA or potential BA. In addition, when time allowed, other areas were searched that had been previously unexplored or incompletely examined during the 2011-2012 nest surveys.

The second objective of the 2013 effort was to complete a nest inventory on the Tonto National Forest. We coarsely identified suitable cliff nest habitat within the Forest using ArcMap™ (ESRI) to calculate slopes greater than 40 degrees. In addition, we compiled and reviewed data on sightings of golden eagles or nests from various state and federal agencies and AGFD's Heritage Database Management System to identify specific areas of interest. While the goal was to inventory large eagle-sized nests, flights were timed within the breeding season (late April to early May) in order to opportunistically collect occupancy and productivity data.

The greatest challenge to detecting golden eagle nests is the remote and often inaccessible terrain in which they occur. Helicopters are an indispensable tool for surveying eagle nests in similar habitat throughout Arizona (e.g., McCarty and Jacobson 2012) and served as the primary search method within this survey. A two to three-person team conducted the helicopter surveys, with at least one observer being an AGFD biologist with five or more years of experience in helicopter searches for cliff-nesting bald eagles. The pilots had experience in flying low-level wildlife surveys in Arizona, and most had flown with us during golden eagle nest surveys in previous years. Helicopters flew at approximately 60 meters (200 ft) above ground level and at 50-60 knots (58-70 mph). Topography, presence of high-tension wires, and wind influenced altitude and speed. Multiple passes of tall cliffs and complex terrain were often necessary for a complete survey of these substrates. At a select few sites, ground visits were conducted to band and transmitter young.

The minimum data gathered for each observation included the time, a GPS waypoint using either a Garmin GPSMAP® 62s or Garmin Colorado® 400t unit, and when appropriate the occupancy

status, nest size, nest condition, and nest aspect. Digital photos were taken of active nests at all new breeding areas, as well as most other large nests when possible.

When breeding status was possible to determine, we followed operational definitions derived from Postupalsky (1974, 1983) and Steenhof and Kochert (1982) (Appendix A). A site was termed a “breeding area” (BA) only if the site was documented as occupied within the last 10 years. Sites with documented occupancy more than 10 years old were termed “historic BAs”. Any areas with “large” nests and not enough observations to designate occupancy status were termed as “potential BAs”. “Large” refers to nests we deemed of suitable size for breeding golden eagles as compared to our experience with bald and 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 Hoechlin (1976) and Driscoll (2010).

RESULTS

The 2013 golden eagle occupancy and nest survey effort totaled 122.9 hours (7,374 minutes) over 26 days (Appendix B), and included the examination of 75 breeding areas (BAs), 10 historic BAs, 114 potential BAs, and new suitable cliff nest habitat throughout Arizona. Surveys occurred in the northwest, central, and north central regions of the state (Figure 1). Significant findings included 101 total occupied BAs including 57 new BAs, and 62 new potential BAs with 84 large nests. Also, 45 active nests were opportunistically followed either to failure or through the early nestling stage, and 21 of these were confirmed failed (46.7%). All but one of the failures occurred after onset of incubation but prior to detection of hatching.

Of 75 BAs examined, 42 (56.0%) were found occupied by golden eagles and 33 (44.0%) were unoccupied (Table 1). Among the occupied sites, 39 were active. When these breeding attempts were last observed, four were documented as successful (four nestlings seen at 80% of fledging age), 25 were still active, and 10 failed. All of the failures occurred after incubation was observed but prior to detection of hatching. Six other BAs were only checked once and were not included in summaries (two visits minimum to determine occupancy status).

Of 10 historic BAs examined, 2 (20.0%) were found occupied by golden eagles and 8 (80.0%) were unoccupied. Final status was not determined at the two active historic BAs, however at least 1 nestling hatched and reached 7 weeks of age. Five other historic BAs were only checked once and were not included in summaries (two visits minimum to determine occupancy status).

Of 114 potential BAs examined, 37 (32.5%) were found occupied by golden eagles and 77 (67.5%) were unoccupied. Among the occupied sites, 31 were active. When these breeding attempts were last observed, one was documented as successful (one nestling fledged), 20 were still active, and ten (32.3%) failed. All but one of the failures occurred after incubation was observed but prior to detection of hatching.

Of 20 newly discovered occupied BAs, 19 were active. When these breeding attempts were last observed, one was documented as successful (one nestling fledged and one foster-fledged), 17 were still active, and one (5%) failed prior to detection of hatching.

Table 1. Summary of Arizona golden eagle occupancy, 2013.					
Number of:	BAs	Historic BAs	Potential BAs	New BAs	Total
Areas checked	75	10	114	20	219
Unoccupied	33	8	77	–	118
Occupied ¹	42	2	37	20	101
Active ¹	39	2	31	19	91
Young hatched ¹	15	1	10	9	35
Failed breeding attempts ¹	10	–	10	1	21

¹Data represents the minimum number detected.

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) 236-7612.

SURVEYS IN SUITABLE NESTING HABITAT

The suitable nesting habitat surveyed in 2013 consisted of areas without known nests that were examined during the nest search of the Tonto National Forest, and as time allowed throughout occupancy flights. Twenty new breeding areas were documented during these efforts (Table 2). Also, 62 new potential BAs were discovered (Appendix C). At three of these new potential BAs, a single golden eagle was seen near at least one large nest (Table 3). Observation of single eagles at these sites indicates they were possibly occupied but did not satisfy the criteria for designation as an occupied breeding area.

Coconino County

Little Sullivan Tank (new). – On March 6 and April 3, a golden eagle was incubating in a new cliff nest (#1). There was one 3.5-week old nestling on May 21 (Figure 2).



Figure 2. *Little Sullivan Tank (left) and Sumac (right) breeding areas. Photos by Kurt Licence.*

Sumac (new). – On April 3, a golden eagle was incubating in a new cliff nest (#1). There was one 3.5-week old nestling on May 21 (Figure 2). AGFD banded this nestling at 7.5 weeks old on June 19 and fitted it with a backpack satellite transmitter. At the same time, a similarly-aged

juvenile, which had been found with minor injuries on June 8 near San Carlos, was fostered to the nest and also banded and transmittered.

Gila County

Ash Mountain (new). – On May 1, a golden eagle was standing in a new cliff nest (#1) with one 4.5-week old nestling. There were also three other large nests in the area (#2-4).

Haigler Creek (new). – On April 24, a golden eagle was incubating or brooding in a new cliff nest (nest #1, Figure 3), and a second new cliff nest was found in the area (#2).

Hardscrabble Canyon 1 (new). – On April 22, a golden eagle was standing in a new cliff nest (#1) with a 2.5-week old nestling (Figure 3).



Figure 3. *Haigler Creek (left) and Hardscrabble Canyon 1 (right) breeding areas. Photos by Kurt Licence.*

Houston Creek (new). – On April 23, a 3-week old golden eagle nestling was found in a new cliff nest (#1). A second nest was also discovered in the area (#2).

Pine Creek 2 (new). – On April 22, a golden eagle was incubating or brooding in a new cliff nest (#1).

Potato Butte (new). – On April 23, a golden eagle was incubating or brooding in a new cliff nest (#1).

Maricopa County

Boulder Creek (new). – On May 22, a 3-week old golden eagle nestling was found in a new cliff nest (#1), and a second nest was found in the area (#2).

Mohave County

Black Mtns 32 (new). – On March 25, a golden eagle was incubating in a new cliff nest (#1), and a second nest was discovered in the area (#2).

Bull Mountain (new). – On March 25, a golden eagle was incubating in a new cliff nest (#1). Three other large nests were found in the area (#2-4).

Burro Creek Wilderness 1 (new). – On March 4 and April 2, a golden eagle was incubating in a new cliff nest (#1), and a second large nest was located in the area (#2).

Table Mountain Plateau (new). – On February 27 and March 26, AGFD observed incubation in a new cliff nest (#1), and located three other large nests in the area (#2-4). WEST reported one nestling 3-4 weeks old on May 7.

Yavapai County

Cypress Mountain (new). – On March 5 and April 1, a golden eagle was incubating in a new cliff nest (#1). A second nest was also found in the area (#2).

Deadman Creek (new). – On April 23, a golden eagle was incubating or brooding in a new cliff nest (#1).

East Cedar Mountain (new). – On April 22, a golden eagle was standing in a new cliff nest (#1) with one very small nestling.

Juniper Mountains 3 (new). – On April 2, a golden eagle was incubating in a new cliff nest (#1). AGFD observed one 3-week old nestling on May 21 (Figure 4), which was approximately 7 weeks old on June 20.

Little Lime Creek (new). – On April 29, a pair of golden eagles was flying and interacting close to a cliff near a large nest (#1).

Midnight Mesa (new). – On April 29, a golden eagle was in a new cliff nest (#1) with a 2.5-week old nestling (Figure 4).

Poland Creek (new). – On April 2, a golden eagle was incubating in a new cliff nest (#1).



Figure 4. *Juniper Mountains 3 (left) and Midnight Mesa (right) breeding areas. Photos by Kurt Licence.*

Table 2. Summary of new breeding areas discovered in suitable nesting habitat in 2013.				
Breeding Area ¹	Status ²	Dates surveyed	Nests in area	Comments
Coconino County				
Little Sullivan Tank	A	3/6, 4/3, 5/21	1	Incubating in nest #1 on 3/6 and 4/3. One 3.5-week old nestling on 5/21.
Sumac	S	4/3, 5/21, 6/19	1	Incubating in nest #1 on 4/3. One 3.5-week old nestling on 5/21. One 7.5-week old nestling on 6/19.
Gila County				
Ash Mountain	A	5/1	4	One 4.5-week old nestling in nest #1 on 5/21.
Haigler Creek	A	4/24	2	Incubating or brooding in nest #1 on 4/24.
Hardscrabble Canyon 1	A	4/22	1	One 2.5-week old nestling in nest #1 on 4/22.
Houston Creek	A	4/23	2	One 3-week old nestling in nest #1 on 4/23.
Pine Creek 2	A	4/22	1	Incubating or brooding in nest #1 on 4/22.
Potato Butte	A	4/23	1	Incubating or brooding in nest #1 on 4/23.
Maricopa County				
Boulder Creek	A	5/22	2	One 3.5-week old nestling in nest #1 on 5/22.
Mohave County				
Black Mtns 32	A	3/25	2	Incubating in nest #1 on 3/25.
Bull Mountain	A	3/25	4	Incubating in nest #1 on 3/25.
Burro Creek Wilderness 1	A	3/4, 4/2	2	Incubating in nest #1 on 3/4 and 4/2. Second golden eagle in area on 3/4.
Table Mountain Plateau	A	2/27, 3/26	4	Incubating in nest #1 on 2/27 and 3/26.
Yavapai County				
Cypress Mountain	F	3/5, 4/1, 5/21	2	Incubating in nest #1 on 3/5 and 4/1. Nest empty on 5/21.
Deadman Creek	A	4/23	1	Incubating or brooding in nest #1 on 4/23.
East Cedar Mountain	A	4/22	1	Adult in nest #1 with at least one very small nestling on 4/22.
Juniper Mountains 3	A	4/2, 5/21, 6/20	1	Incubating in nest #1 on 4/2. One 3-week old nestling on 5/21. One 7-week old nestling on 6/20.
Little Lime Creek	O	4/29	1	Pair of golden eagles flying and interacting close to cliff.
Midnight Mesa	A	4/29	1	One 2.5-week old nestling in nest #1 on 4/29.
Poland Creek	A	4/2	1	Incubating in nest #1 on 4/2.

¹Shaded areas denote Tonto National Forest lands.

²Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed.

Table 3. Summary of golden eagle sightings near large nests in 2013.			
Location	Date	Nests in Area	Comments
Gila County			
Dutchwoman Butte	4/30	1	Adult perched on cliff.
Three Sisters Mountain	4/30	1	One golden eagle flew off cliff.
Mohave County			
Iron Mountain	3/26	2	One golden eagle perched in area.

POTENTIAL BREEDING AREAS

The 114 potential breeding areas (BAs) surveyed in 2013 consisted of nest areas found during the 2011-2012 nest surveys conducted by AGFD. Occupancy was confirmed at 37 areas (Table 4). Additionally, at four potential BAs a single golden eagle was seen in the area. All potential BAs documented as having been occupied during the 2013 nest survey will be reclassified as BAs in future reports.

Coconino County

Anderson Canyon. – On May 16, a 3.5-week old nestling was seen in nest #1. On June 13, AGFD banded the nestling and fitted it with a backpack satellite transmitter. Satellite data indicated that fledging occurred sometime after June 24.

Aubrey Cliffs 1. – A pair of golden eagles was in the area on April 3.

Canyon Diablo 3. – One golden eagle was in the area on March 7 and April 4.

Cataract Canyon North 2. – On March 6 and April 3, a golden eagle was incubating in nest #2.

Grapevine 3. – On March 7 and April 4, a golden eagle was incubating in nest #2, but the nest was empty on May 17.

Jacks Canyon. – On April 4, an adult was incubating in nest #1, and one 6-week nestling was in the nest on May 16.

Little Elden Mountain. – On March 7 and April 4, a golden eagle was incubating in nest #3.

Rattlesnake Wash 1. – On March 7, a golden eagle was incubating in nest #1, but the nest was empty on April 4.

Red Mountain. – On March 6, AGFD attempted a survey of the area but strong winds prevented an effective search. On February 27, SWCA confirmed incubation, however it is unclear which nest was used.

Rhodes Canyon. – AGFD observed a golden eagle incubating in nest #2 on March 6 and April 3. On May 6, WEST reported one 3-week old nestling, and on May 21 AGFD observed one nestling approximately 6-6.5 weeks old.

Mohave County

Austin Peak. – On March 4 and March 27, a golden eagle was incubating in nest #2, and there was one nestling 5.5 weeks old on May 21.

Black Mtns 1. – A golden eagle was incubating in a new nest (#2) on March 26. On May 16, Tetra Tech reported one 4-week old nestling, and further observed the nestling dead in the nest by June 23.

Black Mtns 3. – On February 27, a golden eagle was incubating in nest #3, and possibly brooding on March 26. Two new large cliff nests were found in the area (#4-5).

Black Mtns 9. – On March 25, a golden eagle was incubating in nest #1.

Black Mtns 15. – On February 25 and March 25, a golden eagle was incubating in nest #1.

Black Mtns 22. – On March 25, a golden eagle was incubating in nest #2.

Black Mtns 23. – On February 25 and March 25, a golden eagle was incubating in nest #6.

Black Mtns 24. – On March 25, a golden eagle was incubating in nest #5.

Black Mtns 28. – One golden eagle was in the area on February 25.

Cerbats 2. – A pair of golden eagles was in the area on February 26.

Cherokee Point. – On February 26 and March 27, a golden eagle was incubating in nest #3. Two nestlings 4.5-5 weeks old were seen on May 21. The nest was empty and failed by June 11.

Grand Wash 2. – One golden eagle was in the area on March 26, and a new large cliff nest (#2) was found in the area.

Grand Wash 3. – A pair of golden eagles was in the area on February 27.

Grand Wash 5. – A pair of golden eagles was in the area on February 27, and a new large cliff nest (#3) was found.

Grand Wash 6. – On February 27, a golden eagle was incubating in nest #2, but the nest was empty on March 27. A new large cliff nest (#3) was also discovered.

Grand Wash 7. – On February 26 and March 27, a golden eagle was incubating in nest #1, and there was one 5-week old nestling on May 21.

Hualapai 1. – On March 27, a golden eagle was incubating in a new cliff nest (#3).

Indian Head. – One golden eagle was in the area on March 27.

Long Mountain. – On March 27, a golden eagle was incubating in nest #2, and one 3-week old nestling was seen on May 21.

Peacock Mountains North. – On March 27, a golden eagle was incubating in a new cliff nest (#2), but the nest was empty on May 21.

Peacock Mountains South. – A pair of golden eagles was seen in the area on February 26, and two new large cliff nests (#2-3) were found.

Poachie 2. – On March 4, a new medium to large cliff nest (#3) was discovered.

Virgin Canyon. – On March 26, a new cliff nest (#3) was located in poor condition.

White Hills 1. – On February 27, two new medium to large cliff nests (#2-3) were found.

Yavapai County

Big Black Mesa 1. – On April 2, a golden eagle was incubating in nest #2, but the nest was empty on May 21.

Big Chino Valley 1. – On March 5 and April 2, a golden eagle was incubating in nest #1, but the nest was empty on May 21.

Juniper Mountains 1. – AGFD observed incubation in nest #1 on March 6. On April 2, a golden eagle was in the nest incubating and the second adult was chasing an immature golden eagle from the area. On May 6, WEST reported the nest was empty and had failed. The nest was also empty on May 21.

Juniper Mountains 2. – A pair of golden eagles was in the area on March 5.

Kirkland Peak. – On March 5 and April 1, a golden eagle was incubating in nest #1, with one nestling 7.5 weeks old on May 21.

Martin Mountain. – On March 5 and April 1, a golden eagle was incubating in a new cliff nest (#4), with one nestling 6 weeks old on May 21.

Mingus Mountain. – On April 2, a golden eagle was incubating in nest #1.

Santa Maria Mountains. – On April 1, a golden eagle was incubating in nest #1, but the nest was empty on May 21.

South Mesa. – On March 5, a new large cliff nest (#2) was found.

Sullivan Buttes. – On March 5 and April 2, a golden eagle was incubating in nest #2, but the nest was empty on May 21.

Ward Pocket. – On April 2, a golden eagle was incubating in nest #1.

Weaver Mountains 1. – On March 5, a new large cliff nest (#2) was discovered.

Table 4. Summary of potential breeding areas surveyed for occupancy in 2013 (continued next page).			
Location	Status ¹	Dates	Result
Coconino County			
Anderson Canyon*	S	3/7, 4/4, 5/16, 6/13	Fledged one young after 6/24.
Aubrey Cliffs 1*	O	3/6, 4/3	Pair of golden eagles in area on 4/3.
Canyon Diablo 2	U	3/7, 4/4	All known nests empty. No eagles.
Canyon Diablo 3	U	3/7, 4/4	One golden eagle in area on 3/7 and 4/4.
Cataract Canyon North 1	U	3/6, 4/3	All known nests empty. No eagles.
Cataract Canyon North 2*	A	3/6, 4/3	Incubating in nest #2 on 3/6 and 4/3.
Colten Crater	U	3/6, 4/3	All known nests empty. No eagles.
Government Canyon	U	3/7, 4/4	All known nests empty. No eagles.
Grapevine 2	U	3/7, 4/4	All known nests empty. No eagles.
Grapevine 3*	F	3/7, 4/4, 5/17	Incubating in nest #2 on 3/7 and 4/4. Nest empty on 5/17.
Jacks Canyon 1*	A	4/4, 5/16	Incubating in nest #1 on 4/4. One 6-week old nestling on 5/16.
Little Elden Mountain*	A	3/7, 4/4	Incubating in nest #3 on 3/7 and 4/4.
Long Point 1	U	3/6, 4/3	All known nests empty. No eagles.
O' Leary Peak	U	3/7, 4/4	All known nests empty. No eagles.
Rattlesnake Wash 1*	F	3/7, 4/4	Incubating in nest #1 on 3/7. Nest empty on 4/4.
Red Mountain*	A	3/6	SWCA reported incubation on 2/27.
Rhodes Canyon*	A	3/6, 4/3, 5/21	Incubating in nest #2 on 3/6 and 4/3. One 6.5-week old nestling on 5/21.
Spider Web Ranch	U	3/6, 4/3	All known nests empty. No eagles.
Vineyard Tank	U	3/7, 4/4	All known nests empty. No eagles.
Mohave County			
Aquarius Mountains 1	U	3/4, 3/27	All known nests empty. No eagles.
Aquarius Mountains 2	U	3/4, 3/27	All known nests empty. No eagles.
Aquarius Mountains 3	U	2/27, 3/27	All known nests empty. No eagles.
Aquarius Mountains 4	U	3/4, 3/27	All known nests empty. No eagles.
Aubrey Hills	U	2/28, 3/28	All known nests empty. No eagles.
Aubrey Wilderness 2	U	2/28, 3/28	Red-tailed hawk incubating in nest #3 on 3/28.
Austin Peak*	A	3/4, 3/27, 5/21	Incubating in new nest #2 on 3/4 and 3/27. One 5.5-week old nestling on 5/21.
Bill Williams Mtns	U	2/28, 3/28	All known nests empty. No eagles.
Black Mtns 1*	A	3/26	Incubating in nest #2 on 3/26.
Black Mtns 2	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 2 North	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 3*	A	2/27, 3/26	Incubating in nest #3 on 2/27. Incubating or brooding on 3/26. New nests #4, 5 found.
Black Mtns 4	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 5	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 6	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 8	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 9*	A	2/25, 3/25	Incubating in nest #1 on 3/25.
Black Mtns 10	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 11	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 12	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 13	U	2/25, 3/25	All known nests empty. No eagles.

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

*Indicates a new breeding area was confirmed.

Table 4 continued.			
Location	Status ¹	Dates	Result
Mohave County			
Black Mtns 14	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 15*	A	2/25, 3/25	Incubating in nest #1 on 2/25 and 3/25.
Black Mtns 16	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 17	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 18	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 19	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 20	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 21	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 22*	A	2/25, 3/25	Incubating in nest #2 on 3/25.
Black Mtns 23*	A	2/25, 3/25	Incubating in nest #6 on 2/25 and 3/25.
Black Mtns 24*	A	2/25, 3/25	Incubating in nest #5 on 3/25.
Black Mtns 25	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 26	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 27	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 28	U	2/25, 3/25	All known nests empty. One golden eagle in area on 2/25.
Black Mtns 29	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 30	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns 31	U	2/25, 3/25	All known nests empty. No eagles.
Cerbats 1	U	2/26, 3/26	All known nests empty. No eagles.
Cerbats 2*	O	2/26, 3/26	Two golden eagles in area on 2/26
Cerbats East	U	2/26, 3/26	All known nests empty. No eagles.
Cherokee Point*	F	2/26, 3/27, 5/21, 6/11	Incubating in nest #3 on 2/26 and 3/27. Two 4.5-5 week old nestlings on 5/21. Nest empty on 6/11.
Cottonwood Mountains 1	U	2/26, 3/27	All known nests empty. No eagles.
Grand Wash 1	U	2/27, 3/26	All known nests empty. No eagles.
Grand Wash 2	U	2/27, 3/26	New nest #2 found. One golden eagle in area on 3/26.
Grand Wash 3*	O	2/27, 3/26	Two golden eagles in area on 2/27.
Grand Wash 4	U	2/27, 3/27	All known nests empty. No eagles.
Grand Wash 5*	O	2/27, 3/27	New nest #3 found. Two golden eagles in area on 3/27.
Grand Wash 6*	F	2/27, 3/27	New nest #3 found. Incubating in nest #2 on 2/27. Nest empty on 3/27.
Grand Wash 7*	A	2/26, 3/27, 5/21	Incubating in nest #1 on 2/26 and 3/27. One 5-week old nestling on 5/21.
Grand Wash 8	U	2/26, 3/27	All known nests empty. No eagles.
Grapevine Mesa	U	3/26	Active red-tailed hawk nest.
Hualapai 1*	A	2/28, 3/27	Incubating in new nest #3 on 3/27.
Hualapai 2	U	2/28, 3/27	All known nests empty. No eagles.
Indian Head	U	2/27, 3/27	One golden eagle in area on 3/27.
Long Mountain*	A	2/26, 3/27, 5/21	Incubating in nest #2 on 3/27. One 3-week old nestling on 5/21.
Mohave Mountains 1	U	2/28, 3/28	Red-tailed hawk active in nest #1. New nest #2 found (two large nests.)
Peacock Mountains North*	F	2/26, 3/27, 5/21	Incubating in new nest #2 on 3/27. Nest empty on 5/21.

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

*Indicates a new breeding area was confirmed.

Table 4 continued.			
Location	Status ¹	Dates	Result
Mohave County			
Peacock Mountains South*	O	2/26, 3/27	New nests #2, 3 found. Two golden eagles on 2/26.
Poachie 2	U	3/4, 4/1	New nest #3 found. All known nests empty. No eagles.
Rawhide 1	U	2/28, 3/28	All known nests empty. No eagles.
Rawhide 2	U	2/28, 3/28	All known nests empty. No eagles.
Trout Creek 2	U	3/4, 3/27	All known nests empty. No eagles.
Trout Creek 3	U	2/27, 3/27	All known nests empty. No eagles.
Trout Creek 5	U	2/27, 3/27	All known nests empty. No eagles.
Valentine	U	2/26, 3/27	All known nests empty. No eagles.
Virgin Canyon	U	2/27, 3/26	New nest #3 found. All known nests empty. No eagles.
White Hills 1	U	2/27, 3/26	New nests #2, 3 found. All known nests empty. No eagles.
Yavapai County			
Antelope Creek	U	3/4, 4/1	All known nests empty. No eagles.
Beehive	U	3/4, 4/1	All known nests empty. No eagles.
Big Black Mesa 1*	F	3/5, 4/2, 5/21	Incubating in nest #2 on 4/2. Nest empty on 5/21.
Big Black Mesa 2	U	3/5, 4/2	All known nests empty. No eagles.
Big Chino Valley 1*	F	3/5, 4/2, 5/21	Incubating in nest #1 on 3/5 and 4/2. Nest empty on 5/21.
Burro Creek 2	U	3/4, 4/1	All known nests empty. No eagles.
Cedar Mesa	U	3/5, 4/1	All known nests empty. No eagles.
Cow Creek	U	2/27, 3/27	All known nests empty. No eagles.
Juniper Mountains 1*	F	3/6, 4/2, 5/21	Incubating in nest #1 on 3/6 and 4/2. Nest empty on 5/21.
Juniper Mountains 2*	O	3/5, 4/2	Two adults in area on 3/5.
Kirkland Creek	U	3/5, 4/1	All known nests empty. No eagles.
Kirkland Peak*	A	3/5, 4/1, 5/21	Incubating in nest #1 on 3/5 and 4/1. One 7.5-week old nestling on 5/21.
Martin Mountain*	A	3/5, 4/1, 5/21	Incubating in new nest #4 on 3/5 and 4/1. One 6-week old nestling on 5/21.
Mingus Mountain*	A	4/2	Incubating in nest #1 on 4/2.
Pilot Knob	U	3/4, 3/27	All known nests empty. No eagles.
Pine Creek	U	3/4, 4/1	All known nests empty. No eagles.
Santa Maria Mountains*	F	3/4, 4/1, 5/21	Incubating in nest #1 on 4/1. Nest empty on 5/21.
Smith Mesa	U	3/5, 4/1	All known nests empty. No eagles.
South Mesa	U	3/5, 4/1	New nest #2 found. All known nests empty. No eagles.
Sullivan Buttes*	F	3/5, 4/2, 5/21	Incubating in nest #2 on 3/5 and 4/2. Nest empty on 5/21.
Sycamore Creek 1	U	3/5, 4/1	All known nests empty. No eagles.
Sycamore Mesa	U	3/5, 4/1	All known nests empty. No eagles.
Sycamore Wilderness 1	U	3/7, 4/4	All known nests empty. No eagles.
Trout Creek 4	U	2/27, 3/27	All known nests empty. No eagles.
Ward Pocket*	A	4/2	Incubating in nest #1 on 4/2.
Weaver Mountains 1	U	3/5, 4/1	New nest #2 found. All known nests empty. No eagles.

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

*Indicates a new breeding area was confirmed.

HISTORIC BREEDING AREAS

The 15 historic breeding areas (BAs) surveyed in 2013 consisted of sites which have been documented as occupied in the past, but not within the last ten years. Five sites were only checked once and occupancy was considered undetermined. At the remaining 10 historic BAs, occupancy was confirmed at two sites and a single golden eagle was found in the area at a third site (Table 5). Significant findings are detailed below. Any historic BA documented as being occupied during the 2013 nest survey will be reclassified as a BA in future reports.

Coconino County

Canyon Diablo. – On March 7, a golden eagle was incubating in nest #1, and a new large cliff nest (#2) was found in the area. On April 4, an adult was standing in a position which indicated brooding behavior, but no young were observed. On May 16, there was one 7-week old nestling.

Mohave County

Boriana Canyon. – A pair of golden eagles was reported in courtship flights in February 1979. AGFD examined this area in 2011 and found no nests, but saw one golden eagle in the area. On February 28, 2013, a golden eagle was incubating in a new cliff nest. Since it was unclear from the original 1979 data if a nest had actually been found, we considered this new nest as #2.

Eagle Point. – On February 28, five empty nests were seen and one golden eagle was soaring in the area. All known nests were empty on March 28.

Table 5. Summary of findings at historic breeding areas surveyed in 2013.			
Breeding Area	Status ¹	Dates surveyed	Comments
Coconino County			
Canyon Diablo	A	3/7, 4/4, 5/16	Incubating in nest #1 on 3/7, and possibly brooding 4/4. New nest #2 found. One 7-week old nestling in nest #1 on 5/16.
Steiger Tank	U	3/7, 4/3	All known nests empty. No eagles.
Upper Lake Mary	–	5/8	Nest #1 not found. Nest #2 empty. No eagles.
Gila County			
Coon Creek	–	4/30	No nests found. No eagles.
Diamond Butte	–	4/23	No nests found. No eagles.
Mohave County			
Boriana Canyon	A	2/28, 3/28	Incubating in new nest #2 on 2/28 and 3/28.
Crookton	–	3/5	No nests found. No eagles.
Eagle Point	U	2/28, 3/28	All known nests empty. One golden eagle in area on 2/28.
Flatop	U	2/28, 3/28	All known nests empty. No eagles.
Francis Creek	U	2/28, 3/27	All known nests empty. No eagles.
Hells Half Acre	U	3/4, 4/1	All known nests empty. No eagles.
McCracken Mountains	U	2/28, 3/28	All known nests empty. No eagles.
Shingle Canyon	U	2/28, 3/28	All known nests empty. No eagles.
White Hills	U	2/27, 3/26	All known nests empty. No eagles.
Yavapai County			
Woodchute Mountain	–	4/2	All known nests empty. No eagles.

¹ Breeding area status codes: O=occupied, A=active, U=unoccupied, –=undetermined.

¹ Shaded areas denote Tonto National Forest lands.

BREEDING AREAS

The 80 breeding areas surveyed in 2013 consisted of sites that had documented golden eagle occupancy in at least one of the past ten years, and were discovered prior to this year's survey. Six sites were only checked once and occupancy was considered undetermined. At the remaining 75 BAs, occupancy was confirmed at 42 sites (Table 6). Significant findings and field activities in 2013 are discussed below, including new nests, sightings of golden eagles at unoccupied BAs, and banding of nestlings.

Apache County

Wolf Mountain. – On June 5, an adult golden eagle was in nest #1 with one 6-week old nestling. On June 17, AGFD banded the nestling and fitted it with a backpack satellite transmitter. Satellite data indicates fledging occurred sometime in July.

Coconino County

Aubrey Cliffs 2. – On March 6 and April 3, a golden eagle was incubating in nest #4. On May 6, WEST reported one 3-week old nestling, however the nest was empty on May 21.

Aubrey Cliffs 3. – On March 6, AGFD observed an adult golden eagle in the area, and on April 3 an adult flushed from nest #3. The nest appeared to be empty but contents were not confirmed. On May 6, WEST reported an adult sitting tight in the nest, presumed to be brooding but no young were observed.

Aubrey Cliffs 5. – One golden eagle was perched in the nest area on March 6 and April 3.

Boquillas. – One golden eagle was perched in the nest area on March 6.

Chavez Pass. – This area was searched extensively on March 7 and no nest was found at the coordinate. The area had last been checked in 2012 with the same result.

Double A Knoll. – On March 7 and April 3, a golden eagle was incubating in nest #1, and there was one nestling 5-5.5-weeks old on May 21. AGFD banded the nestling and fitted it with a backpack satellite transmitter on June 12. Satellite data indicated fledging occurred around June 30.

Grindstone Wash. – On March 7 and April 4, a golden eagle was incubating in a new cliff nest (#3).

Mesa Butte. – On February 27, SWCA reported one adult golden eagle perched in the area. On March 6, AGFD observed incubation in nest #1.

Round Mountain. – On March 6, one golden eagle was in the area. On April 3, an adult flushed from nest #1 however the nest contents were hidden because of an overhanging ledge and we left the area immediately. Two adults were in the area on May 21.

Gila County

Oak Spring Canyon. – On May 22, a survey of the area was attempted but strong winds prevented a complete examination by air. Nest #3 was empty. There was one other nest which appeared to be empty, but was not determined if it was nest #1 or #2.

Parker Creek. – On April 30, a new cliff nest (#4) was discovered with one 3-week old golden eagle nestling, and four other new large nests were found in the area (#5-8).

Moody Point. – On May 1, a new large cliff nest was located in the area (#2).

Mohave County

Aubrey Peak Wilderness. – On March 28, a golden eagle was incubating in a new cliff nest (#9) and another new large nest was found in the area (#10).

Black Mtns 1. – On March 26, a golden eagle was incubating in a new cliff nest (#2).

Black Mtns 3. – A golden eagle was incubating in nest #3 on February 27 and March 26, and two new nests were found in the area (#4-5). On May 16, Tetra Tech reported two 5-week old nestlings, and further observed that one fledged prior to June 13, and the other fledged June 14.

Black Mtns 9. – On March 25, a golden eagle was incubating in a new cliff nest (#2). At least ten nests were found in varying condition and heights along the same cliff face, however due to their proximity it was not possible to obtain a separate location for each one.

Black Mtns 15. – On March 25, a new large cliff nest was found in the area (#2).

Black Mtns 23. – On February 25 and March 25, a golden eagle was incubating in a new cliff nest (#6). Nests #3-5 were empty, and there were at least four nests in the location of #1 and #2.

Black Mtns 24. – On March 25, a golden eagle was incubating in a new cliff nest (#5) and another new large nest was discovered in the area (#6).

Black Mtns South. – On March 25, a red-tailed hawk was incubating in nest #1, which had been used by golden eagles in 2011.

Black Mtns West. – New cliff nests #5-11 were documented during two visits, on February 25 and March 25, with up to 13 total nests in the area.

Burro Cliffs. – On March 4 and April 1 one golden eagle was seen close in the nest area. Nests #1 and 2 were not seen during the first visit, however all known nests (#1-4) were empty on the second visit.

Cerbats West. – A pair of golden eagles was seen soaring together in the area on February 26.

Cherokee Point. – On February 26, a golden eagle was incubating in new a cliff nest (#3).

Cottonwood Cliffs North. – One golden eagle was seen in the area on March 27.

Grand Wash 5. – On March 27, a pair of adult golden eagles was in the area, and a new large cliff nest (#3) was discovered.

Grand Wash 6. – On March 27, a new large cliff nest (#3) was found in the area.

Grand Wash North 2. – On March 26, a golden eagle was incubating in a new cliff nest (#2).

Hualapai 1. – On March 27, a golden eagle was incubating in a new cliff nest (#3).

Hualapai South. – A golden eagle was flying in the area on February 28, and a new large cliff nest (#2) was found on March 28.

Long Mountain. – On March 27, a golden eagle was incubating in a new large cliff nest (#2).

Middle Grand Wash. – On March 26, a golden eagle was incubating in a new cliff nest (#2). On May 7, WEST reported two nestlings 3-4 weeks old.

Panther Point. – One golden eagle was seen in the area on February 27.

Peacock Mountains North. – Two new cliff nests were found (#2-3), with an adult incubating in nest #2 on March 27.

Trap Spring. – On March 27, a golden eagle was incubating in a new cliff nest (#2) concealed at the base of a tree on the side of a rock outcrop below and to the right of nest #1.

White Hills South. – A new cliff nest (#3) was found in the area on March 26.

Yavapai County

Martin Mountain. – On March 5, a golden eagle was incubating in a new cliff nest (#4).

Peoples Canyon. – On April 1, a new cliff nest (#4) was discovered, with an adult feeding two small nestlings approximately one week old.

Picacho Butte. – On March 5, a new large cliff nest was found in the area (#2).

Poachie. – On April 1, a new large cliff nest was located in the area (#4).

Sycamore. – Three new large cliff nests (#5-7) were found on March 5 and April 1.

Watson Lake. – On March 14, one golden eagle was seen in the area.

Table 6. Summary of findings at known breeding areas surveyed in 2013 (continued next page).			
Breeding Area	Status ¹	Dates surveyed	Comments
Apache County			
Wolf Mountain	S	6/5, 6/17	One 6-week old nestling on 6/5; 7.5-8 weeks old on 6/17.
Coconino County			
Aubrey Cliffs 2	F	3/6, 4/3, 5/21	Incubating in nest #4 on 3/6 and 4/3. Nest empty on 5/21.
Aubrey Cliffs 3	A	3/6, 4/3	One golden eagle in area on 3/6. Flushed from nest #3 on 4/3, nest contents undetermined. WEST, Inc. reported an adult likely brooding on May 6.
Aubrey Cliffs 4	U	3/6, 4/3	All known nests empty. No eagles.
Aubrey Cliffs 5	U	3/6, 4/3	One golden eagle in area on 3/6 and 4/3.
Big Bud Tank	U	3/6, 4/3	All known nests empty. No eagles.
Big Chino	U	3/5, 4/2	All known nests empty. No golden eagles. One immature bald eagle in area.
Boquillas	U	3/6, 4/3	All known nests empty. One golden eagle in area on 3/6.
Cataract Canyon	U	3/6, 4/4	Active great-horned owl nest.
Cedar Mountain	A	3/6, 4/3, 5/21	Incubating in nest #1 on 3/6 and 4/3. One 3-week old nestling on 5/21.
Chavez Pass	–	3/7	No nests found. No eagles.
Double A Knoll	S	3/7, 4/3, 5/21, 6/12	Incubating in nest #1 on 3/7 and 4/3. One 5-5.5 week old nestling on 5/21. One 8-week old nestling on 6/12.
Double Knobs	--	3/6	All known nests empty. No eagles.
Eagle Nest Mountain	U	3/7, 4/3	All known nests empty. No eagles.
Eagle Rock	–	4/3	All known nests empty. No eagles.
Flat Mesa	S	3/7, 4/4, 5/21	Incubating in nest #1 on 3/7. One 8-week old nestling on 5/21.
Grapevine	U	3/7, 4/4	All known nests empty. No eagles.
Grindstone Wash	A	3/7, 4/4	New nest #3 found. Incubating in nest #3 on 3/7 and 4/4.
Henderson	A	3/7, 4/4	Incubating in nest #1 on 3/7 and 4/4.
Johnson Canyon	U	3/7, 4/4	All known nests empty. No eagles.
Mesa Butte	A	3/6	Incubating in nest #1 on 3/6.
Mount Floyd	F	3/6, 4/3, 5/21	Incubating in nest #2 on 4/3. Nest empty on 5/21.
Muleshoe	–	3/7	No nests found. No eagles.
Perrin Ranch	U	3/6, 4/3	All known nests empty. No eagles.
Red Butte	A	3/6, 4/3	Incubating in nest #1 on 3/6 and 4/3.
Round Mountain	O	3/6, 4/3, 5/21	One adult in area on 3/6. One adult flushed from nest #1 on 4/3, contents unknown. Two adults in area on 5/21.
Gila County			
Oak Spring Canyon	–	5/22	Status unknown; incomplete survey.
Parker Creek	A	4/30	One 3-week old nestling in new nest #4. Also found new nests #5-8.
Moody Point	U	5/1	New nest #2 found. All known nests empty. No eagles.

¹Breeding area status codes: O=occupied, A=active, U=unoccupied, – =undetermined .

Table 6 continued.			
Breeding Area	Status ¹	Dates surveyed	Comments
Mohave County			
Aubrey Peak Wilderness	A	2/28, 3/28	Incubating in new nest #9 on 3/28. New nest #10 also found.
Black Mtns 1	A	3/26	Incubating in new nest #2.
Black Mtns 3	A	2/27, 3/26	New nests #4-5 found. Incubating in nest #3 on 2/27 and 3/26.
Black Mtns 9	A	2/25, 3/25	Incubating in new nest #2 on 3/25. At least 10 nests in area.
Black Mtns 15	A	2/25, 3/25	New nest #2 found. Incubating in nest #1 on 2/25 and 3/25.
Black Mtns 23	A	2/25, 3/25	Incubating in new nest #6 on 2/25 and 3/25.
Black Mtns 24	A	2/25, 3/25	Incubating in new nest #5 on 3/25. New nest #6 also found.
Black Mtns East	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns North	U	2/25, 3/25	All known nests empty. No eagles.
Black Mtns South	U	2/25, 3/25	Red-tailed hawk incubating in nest #1 on 3/25.
Black Mtns West	U	2/25, 3/25	New nests #5-11 found. Up to 13 large nests in area.
Burro Cliffs	U	3/4, 4/1	All known nests empty, however #1 and 2 not seen on 3/4. One golden eagle in area on 3/4 and 4/1.
Cerbats North	U	2/26, 3/26	All known nests empty. No eagles.
Cerbats West	O	2/26, 3/26	All known nests empty. Pair of golden eagles in area on 2/26.
Cottonwood Cliffs Central	A	2/26, 3/27, 5/21	Incubating in nest #2 on 3/27. One 4.5-week old nestling on 5/21.
Cottonwood Cliffs North	U	2/26, 3/27	All known nests empty. One golden eagle in area on 3/27.
Cross Mountain	F	2/27, 3/27, 5/21	Incubating in nest #2 on 3/27. Nest empty on 5/21.
Elephant Mountain	U	3/4, 4/1	All known nests empty. No eagles.
Grand Wash 5	O	2/27, 3/27	New nest #3 found. Two adult golden eagles in area on 3/27.
Grand Wash 6	F	2/27, 3/27	New nest #3. Incubating in nest #2 on 2/27. Nest empty on 3/27.
Grand Wash North	U	2/27, 3/26	All known nests empty. No eagles.
Grand Wash North 2	A	2/27, 3/26	Incubating in new nest #2 on 3/26.
Hualapai 1	A	2/28, 3/27	Incubating in new nest #3 on 3/27.
Hualapai Mountains	U	2/28, 3/28	All known nests empty. No eagles.
Hualapai South	U	2/28, 3/28	New nest #2 found. One golden eagle in area on 2/28.
Long Mountain	A	2/26, 3/27, 5/21	Incubating in new nest #2 on 3/27. One 3-week old nestling on 5/21.
Middle Grand Wash	A	2/27, 3/26	Incubating in new nest #2 on 3/26.
Panther Point	U	2/27, 3/27	All known nests empty. One golden eagle in area on 2/27.
Peacock Mountains North	F	2/26, 3/27, 5/21	Incubating in new nest #2 on 3/27. New nest #3 also found. Nest empty on 5/21.
Peacock Peak	U	2/26, 3/27	All known nests empty. No eagles.
Red Tanks	U	2/26, 3/27	All known nests empty. No eagles.
Trap Spring	F	2/26, 3/27, 5/21	Incubating in new nest #2 on 3/27. Nest empty on 5/21.
Trout Creek	U	3/4, 3/27	All known nests empty. No eagles.
White Hills South	U	2/27, 3/26	New nest #3 found. All known nests empty. No eagles.
Wright Canyon	U	3/26, 3/27	All known nests empty. No eagles.
Yavapai County			
Camp Wood	U	3/4, 4/1	All known nests empty. No eagles.
Cherry Creek	-	4/2	All known nests empty. No eagles.
Granite	F	1/7, 2/4, 3/14, 4/19	Incubating in nest #2 on 2/4. Incubating or brooding on 3/14. Nest empty on 4/19.

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

Table 6 continued.			
Breeding Area	Status ¹	Dates surveyed	Comments
Hell Point	A	2/4, 3/14, 4/19	Incubating in nest #4 on 3/14. Possibly brooding on 4/19.
Martin Mountain	A	3/5, 4/1, 5/21	Incubating in new nest #4 on 3/5 and 4/1. One 6-week old nestling on 5/21.
McCloud Mountains	U	3/5, 4/1	All known nests empty. No eagles.
Mohon Mountains	F	3/4, 3/27	Incubating in nest #3 on 3/4. Nest empty on 3/27.
Mount Hope	A	3/4, 4/1, 5/21	Incubating in nest #1 on 3/4 and 4/1. One 4.5-week old nestling on 5/21.
Mormon Pocket	F	1/7, 2/4, 3/14, 4/19	Incubating in nest #2 on 3/14. Nest empty on 4/19.
Peoples Canyon	A	4/1	Two very small nestlings fed by adult in new nest #4 on 4/1.
Picacho Butte	S	3/5, 4/2, 5/21	New nest #2 found. Incubating in nest #1. One 8-week old nestling on 5/21.
Pine Spring	F	3/5, 4/1, 5/21	Incubating in nest #1 on 3/5 and 4/1. Nest empty on 5/21.
Poachie	U	4/1	New nest #4 found.
South Butte	U	3/5, 4/2	All known nests empty. No eagles.
Sycamore	A	3/5, 4/1, 5/21	New nest #5-7 found. Incubating in nest #4 on 3/5 and 4/1. One nestling 3.5-weeks old on 5/21.
Watson Lake	U	3/4, 3/14	All known nests empty. One golden eagle in area on 3/14.

¹Breeding area status codes: O=occupied, A=active, U=unoccupied, – =undetermined .

ADDITIONAL GOLDEN EAGLE SIGHTINGS

During the 2013 occupancy and nest surveys, 8 sightings of golden eagles were documented that were not associated with a nest area (Table 7). Additional details for the most significant sightings are included below.

Maricopa County

Cypress Ridge. – On May 22, a pair of adults was perched together in a small canyon within the southern portion of the Mazatzal Wilderness, however there was no evidence of breeding. The closest nest was found 2.0 miles away, which was too far away to confidently associate with the pair.

Table 7. Summary of additional golden eagle sightings in 2013.			
Location	Date	Number of Eagles	Comments
Gila County			
Mogollon Rim	4/29	1	Adult perched on lower point.
Sierra Ancha	4/29	1	Adult perched on cliff side.
Maricopa County			
Cypress Ridge	5/22	2	Pair of adults perched together.
Yavapai County			
Bradshaw Mountains	4/2	1	One adult soaring.
Bradshaw Mountains	4/2	1	One immature slope-soaring.
Granite Peak	4/22	1	One adult flew low, then perched high. No nests found.
Juniper Mesa	3/4	1	One golden eagle soaring.
Sugarloaf Mountain	2/26	1	One adult soaring around small butte.

OVERVIEW

With nest inventory survey data collected by AGFD in 2011-2012, a database of large nests was established for a wide area of the state. The 2013 surveys consisted of inventory efforts on the Tonto National Forest (TNF) and the commencement of occupancy surveys in north-central Arizona. In total 57 new BAs were identified, including 11 on the TNF. Among all areas surveyed, 101 BAs were confirmed occupied. Occupancy measures should be interpreted with caution because it seems likely that adult pairs were missed at some areas, and indeed few of the BAs were designated as occupied-only status.

A large number of failures were documented as having occurred sometime after incubation had started and prior to observation of young. However, not all of the active nests were followed to determine their final outcome, so additional failures at later points in the breeding attempts presumably would have occurred. Likewise, success was not reported since not enough active nests were followed through fledging, and gathering productivity data was a secondary, opportunistic, objective of this year's effort.

Currently, including the 2013 survey data, there are 168 known golden eagle BAs and 55 historic BAs in Arizona, excluding those that occur on Native American lands (Figure 2).

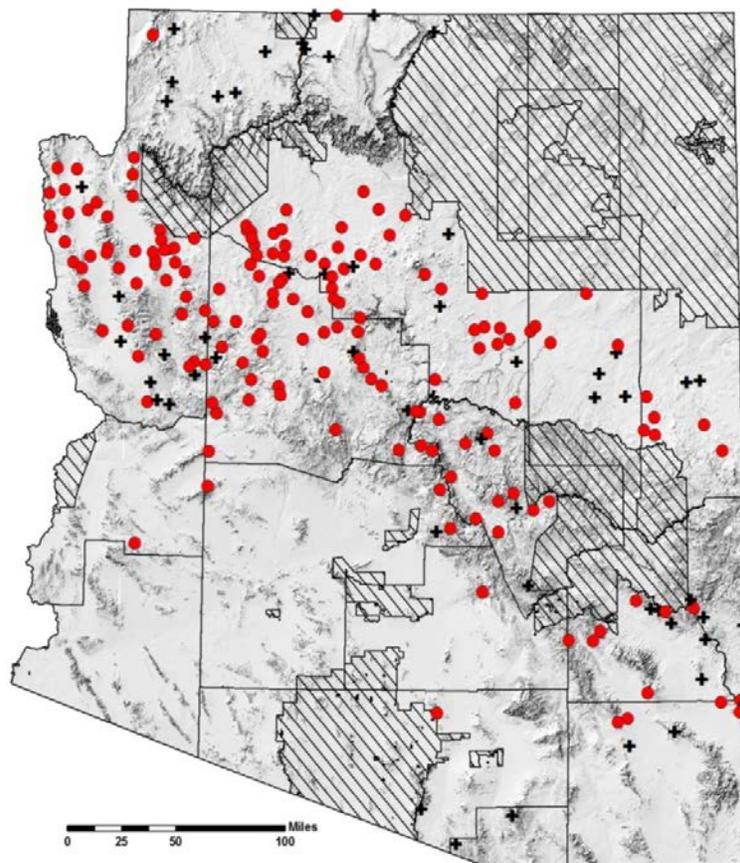


Figure 5. Distribution of current (circles) and historic (crosses) golden eagle breeding areas in Arizona as of 2013. Breeding areas are not shown on Native American lands (shaded).

BIRD CONSERVATION REGIONS

Management of golden eagle populations is currently being evaluated by USFWS using Bird Conservation Regions (BCRs) as ecological units. Arizona is approximately divided in thirds by BCR 16, 33, and 34 (NABCI 2000). An insignificant portion of BCR 35 (Chihuahuan Desert) is represented as well. Surveys in 2013 occurred in BCR 16 (Southern Rockies/Colorado Plateau) and BCR 33 (Sonoran and Mohave Deserts) in northern and western Arizona south of the Colorado River, and BCR 34 (Sierra Madre Occidental) in central Arizona. Excluding Native American lands, the number of known breeding areas, potential breeding areas, and large nests is weighted toward BCRs 33 and 34, where AGFD has spent the most survey effort since 2011 (Table 7).

BCR number	BAs	Historic BAs	Potential BAs	Large Nests
16	43*	19	64	99
33	51*	11	120	217
34	75	24	163	251
35	0	1	1	9

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

MANAGEMENT RECOMMENDATIONS

1. Priority areas for future aerial nest inventory surveys include all unexplored suitable breeding habitat and historic BAs within 10 miles of proposed wind and solar projects.
2. Future nest survey efforts should also focus on large segments of suitable habitat within each of Arizona's three main BCR's that we have not explored.
 - 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, and cliffs east of Colorado City.
 - b. In BCR 33, portions of Burro Creek and Bozarth Mesa, Department of Defense lands not covered by AGFD Wildlife Contracts Branch in 2013, and Kofa National Wildlife Refuge.
 - c. In BCR 34, the southern quarter of Tonto National Forest, Chiricahua Mountains, Mule Mountains, and most of Coronado National Forest (except the Dragoon, Galiuro, Santa Teresa, Whetstone, and Winchester Mountains).
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 includes areas where we found a single golden eagle sighted 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.

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APPENDIX A: RAPTOR REPRODUCTIVE STATUS CRITERIA

Breeding Area (BA): An area containing 1 or more nests within the range of 1 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 breeding area 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 1 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 1 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 1 young fledged during the breeding season under consideration. Nests were successful if at least 1 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 breeding area.

APPENDIX B: AREAS SURVEYED IN 2013.

Table 8. Summary of areas searched and flight time in 2013 golden eagle nest surveys.		
Date	Time (min)	Areas surveyed ¹
2/25	354	Black Mountains
2/26	246	Peacock Mountains, Cottonwood Cliffs, Cherokee Point, Cerbat Mountains
2/27	366	Grand Wash Cliffs, White Hills
2/28	270	Hualapai Mountains, Aubrey Peak Wilderness, Mohave Mountains, Bill Williams Refuge
3/4	324	Trout Creek, Aquarius Mts., Burro Creek, Burro Creek Wilderness, Juniper Mountains
3/5	276	Juniper Mountains, Weaver Mountains, Big Chino Valley, Big Black Mesa
3/6	276	Aubrey Cliffs, Long Point
3/7	264	Grapevine Canyon, Canyon Diablo, Anderson Mesa
3/25	336	Black Mountains
3/26	294	Grand Wash Cliffs, White Hills, Cerbat Mountains, Lake Mead
3/27	288	Grand Wash Cliffs, Peacock Mountains, Cherokee Point
3/28	252	Hualapai Mountains, Aubrey Peak Wilderness, Mohave Mountains, Bill Williams Refuge
4/1	270	Juniper Mountains, Weaver Mountains, upper Burro Creek, Mt. Hope, Cypress Mountain
4/2	258	Juniper Mountains, Bradshaw Mountains, Mingus Mountain, Prescott National Forest
4/3	264	Aubrey Cliffs, Long Point, Boquillas, Cataract Canyon, Red Butte
4/4	252	Sycamore Canyon, Bill Williams Mountain, Grapevine Canyon, Canyon Diablo
4/22	330	New River Mountains, Tonto National Forest, Verde River mountains, Mogollon Rim
4/23	336	Mazatzal Mountains, Tonto Creek
4/24	318	Mazatzal Mountains, Tonto Creek, Cherry Creek
4/25	138	Four Peaks, Tonto National Forest, Goldfield Mountains
4/29	336	Mogollon Rim
4/30	324	Sierra Ancha
5/1	360	Sierra Ancha, Cherry Creek, Salt River
5/2	24	Windy conditions precluded continuation of survey
5/21	354	Flagstaff to Kingman
5/22	264	Mazatzal Mountains, Mt. Ord, Four Peaks

¹Shaded areas denote Tonto National Forest lands.

APPENDIX C: NEW POTENTIAL BREEDING AREAS DOCUMENTED IN 2013

Table 9. Summary of new potential breeding areas with large nests documented in 2013.				
Area Name	Nest #	Aspect	Nest condition	Comments
Coconino County				
Bill Williams Mountain 1	1	W	Fair	Disrepair.
Ferguson Tank	1	N	Poor	Not very good, old, but some greenery.
Mays Wash	1	n/a	Poor	Very small wash and substrate. Two small-medium nests and 1 active raven nest nearby.
Gila County				
Armer Gulch	1	n/a	Fair, Good	Two nests on lower on-third of cliff.
Bryant Mountain	1	n/a	Fair	Behind or below a shrub in a hole in cliff.
Cherry Creek 2	1	W	Fair	Borderline size.
	2	W	Good	Borderline size.
Cherry Creek 3	1	E	Fair, Good	One large and one medium nest by creek.
Cherry Creek 4	1	W/NW	Fair	On ledge about midway.
	2	W/NW	Fair	Lower set of bouldery cliff line.
Cherry Creek 5	1	W	Poor	Old, not much material.
Coon Creek Butte	1	W	Fair	Relatively low on wall above slope.
Dutchwoman Butte	1	NW	Fair	Nest on highest set of cliffs. One golden eagle in area.
Gisela Mountain	1	N	Good	Nice nest.
	2	n/a	n/a	Empty.
	3	n/a	Poor	Old, but materials look like possibly used by eagles.
Hardscrabble Canyon 2	1	W	Good	Empty.
Hellsgate Wilderness 1	1	N/NW	Fair/Good	Empty.
	2	n/a	Poor	Empty.
	3	n/a	Poor	Mid-way up cliff in vertical crack.
Limestone Hills	1	SE	Fair	Empty.
Mailbox Mesa	1	N	Good	Nice-looking nest.
Mazatzal Wilderness 2	1	NW	n/a	Mid-level on cliff by shrub on ledge.
Mazatzal Wilderness 3	1	S	Fair	Small outcrop. Perhaps borderline size.
Naegelin	1	S	Poor/Fair	Cacti growing in nest.
Pueblo Canyon	1	N	Fair	Hidden back in hole on small substrate. On second level of cliffs above creek.
Salome Wilderness 1	1	n/a	Fair	At corner of large outcrop, low near creek. Borderline size.
Salome Wilderness 2	1	n/a	Poor, Good	Two nests on low cliff. Borderline size.
Salt River Canyon	1	n/a	Fair	Nest looked worn from use.
	2	n/a	Good	Empty.
	3	n/a	Fair/Good	Also a second, smaller nest nearby.
	4	n/a	Fair	Higher on cliff.
Sheep Basin Mountain	1	N	Fair	Spilling down.
Sierra Ancha 1	1	W	Fair	Empty.
Sierra Ancha 2	1	W/NW	Fair	Very well hidden in slot. Borderline size.
Sierra Ancha 3	1	W	Good	Empty.
Sierra Ancha 4	1	n/a	Fair	Borderline size.
Sierra Ancha 5	1	n/a	Fair	Empty.
	2	n/a	Fair	Empty.
	3	n/a	Fair	Empty.

¹Shaded areas denote Tonto National Forest lands.

Table 9 continued.				
Area Name	Nest #	Aspect	Nest condition	Comments
Sierra Ancha 5	4	n/a	Fair	Some whitewash. Appears used in the last year or two.
	5	n/a	Fair, Good	Two nests, one large and one medium.
Sierra Ancha 6	1	E/SE	Fair	Empty.
Sierra Ancha 7	1	n/a	Poor	Old nest.
Sierra Ancha 8	1	n/a	Poor	Very poor nest. Peregrine falcon incubating.
Spring Creek	1	N	Fair/Good	Definitely eagle-sized. Very large nest.
	2	N	Good	Good size.
Three Sisters Mountain	1	W	Fair/Good	Definitely eagle-sized. One golden eagle flew off cliff.
Tonto Creek 1	1	S	Fair	Empty.
Vosburg Mesa	1	W	Fair	Empty.
Maricopa County				
Goldfield Mountains	1	W	Poor/Fair	Spread out on ledge. High near top of cliffs.
Mazatzal Wilderness 1	1	N	Fair/Good	Empty.
Mazatzal Wilderness 6	1	n/a	Poor	Low, hidden well.
Willow Spring Mountain	1	N	Fair	Very large. Definitely eagle-sized.
Mohave County				
Grand Wash 9	1	NW	Poor/Fair	Not very good, small substrate (possibly hawk nest).
Havasu Wilderness 1	1	n/a	Fair	Large nest.
Hualapai Valley 1	1	n/a	Fair	Large nest on power line structure.
Iron Mountain	1	n/a	Poor/Fair	Old. One golden eagle perched in area.
	2	n/a	Poor	On higher part of cliffs.
Lake Mead NRA 1	1	N	Good	Well-hidden nest higher on cliff.
Music Mountains 1	1	SW	Fair	Empty.
Tres Alamos	1	S	Poor/Fair	Nest with whitewash as if recently used.
	2	S	Poor/Fair	Empty.
	3	S	Fair	Nest back in shadow, relatively low.
	4	S	Fair	Low.
	5	N	Poor	Tucked back in shadow of cliff, top one-third.
Virgin Canyon 2	1	E	Good	Good shape.
	2	W	Poor	Bad condition but large. Low.
Yavapai County				
Bradshaw Mountains 1	1	n/a	n/a	At least 2 old nests back on ledges.
Bradshaw Mountains 2	1	W	Fair	On middle cliffs. Could be a hawk nest.
Casner Mountain 1	1	n/a	Fair	Higher on knife-edge cliffs.
	2	n/a	Fair	Lower on knife-edge cliffs.
Gabriel Tank	1	N	Fair/Good	Two large nests on small substrate.
Hell Canyon	1	E	Fair/Good	Empty. Definitely eagle-sized.
Janes Butte	1	N	Fair	Perhaps borderline size but good habitat.
Mazatzal Wilderness 4	1	NW	Fair	Good size, worn down.
Mazatzal Wilderness 5	1	S	Fair	Empty.
	2	N	Fair	Empty.
New River 1	1	NW	Poor/Fair	A few large sticks.
Rugged Mesa	1	E	Fair	Higher cliffs.
Sunset Mountain	1	N	Fair	Lots of whitewash. Pair of bald eagles in the area.
	2	W/NW	Fair	Nest low on cliff slope.
Trap Canyon	1	N	Fair	Empty.
Tucker Canyon	1	W	Fair	Large nest on west side of creek.

¹Shaded areas denote Tonto National Forest lands.