

ARIZONA GOLDEN EAGLE PRODUCTIVITY ASSESSMENT 2024

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INTRODUCTION

In 1940, the U.S. Congress passed the Bald Eagle Protection Act to protect declining populations of bald eagles (*Haliaeetus leucocephalus*). This legislation was amended in 1962 to include golden eagles (*Aquila chrysaetos*), becoming the Bald and Golden Eagle Protection Act (Eagle Act). In the late 2000s, the U.S. Fish and Wildlife Service (USFWS) clarified definitions within the Eagle Act and finalized regulations providing a mechanism to authorize take (USFWS 2007a, b; USFWS 2009). In December 2013 the USFWS also finalized revisions to the rule governing eagle take permits and extended programmatic permits to a maximum of 30 years (USFWS 2013), a rule which was challenged in court and vacated. As a result, the USFWS developed a new rule and a programmatic environmental impact statement in December 2016 to reinstate the 30-year permit and to modify other aspects of take permit implementation (USFWS 2016a, 2016b, 2017). In 2024, the USFWS made additional revisions to the regulations governing permits for incidental take and eagle nest take (USFWS 2024). For implementation of take permits to be compatible with the congressional intent of the Eagle Act's preservation standard (i.e., stable or increasing breeding populations), accurate population estimates and trends are needed (Millsap et al. 2013).

In 2010, after the USFWS made its initial clarifications to the Eagle Act, a group of state and federal agencies, Native American tribes, and private entities in Arizona established the Southwestern Golden Eagle Management Committee (SWGEMC) as a means to enhance coordination and communication among interested parties and to provide oversight for golden eagle management in the state. Prior to the formation of the SWGEMC, information on the status, distribution, and life history of breeding golden eagles in Arizona was limited (e.g., Millsap 1981, Eakle and Grubb 1986, Grubb and Eakle 1987, Corman and Wise-Gervais 2005). At the time, observations collected by the Arizona Game and Fish Department (Department) were dated or were gathered incidentally or intermittently, and no formalized study to document statewide population numbers had ever been implemented. In 2006, the Department conducted a ground survey effort limited to 85 previously known breeding areas (BAs) and found 14 were occupied by golden eagles (unpublished data). All of these past observations and other information from partners were used to establish a foundation for a more coordinated population assessment effort in Arizona.

Some members of the SWGEMC provided funds to the Department to implement statewide nest inventory, occupancy, and productivity surveys for cliff-nesting golden eagles. The Department's Terrestrial Wildlife (Nongame) Branch conducted aerial occupancy and nest survey efforts in 2011-2014 and 2020-2023, and completed a five-year project in 2015-2019 to assess productivity at a subsample of known BAs (McCarty and Jacobson 2011, 2012; McCarty et al. 2013-2021, 2023). Additionally, the Department's Wildlife Contracts Branch conducted surveys on the Barry M. Goldwater Air Force Range (BMGR) via fixed-wing aircraft in May 2013 and March 2014 and via helicopter in August 2014 (Sturla et al. 2014a), as well as other helicopter surveys in southwestern Arizona (Sturla et al. 2014b). This report summarizes results from the 2024

productivity survey, excluding those conducted on the BMGR. After the 2024 season, there were 365 known golden eagle BAs, 56 historic BAs, and 483 potential BAs outside of Native American lands in Arizona.

STUDY AREA

In 2024, the golden eagle occupancy and reproductive assessment was conducted in southeastern Arizona covering portions of Cochise, Graham, Greenlee, Pima, Pinal, and Santa Cruz counties (Figure 1). Surveys occurred mainly over lands administered by the Arizona State Land Department, Bureau of Land Management, U.S. Forest Service (USFS), and private lands. The survey region was generally characterized by a series of “sky islands”, isolated mountain ranges separated by broad valleys. Elevation of surveyed areas ranged from approximately 457 to 2,590 m (1,500 to 8,500 ft).

The surveyed areas included a variety of habitat types within Bird Conservation Regions 33, 34, and 35 (NABCI 2000) and were characterized by eight biotic communities: Chihuahuan Desertscrub, Great Basin Conifer Woodland, Interior Chaparral, Madrean Evergreen Woodland, Plains and Great Basin Grassland, Rocky Mountain (Petran) Montane Conifer Forest, Semidesert Grassland, and Sonoran Desertscrub (Brown 1994).

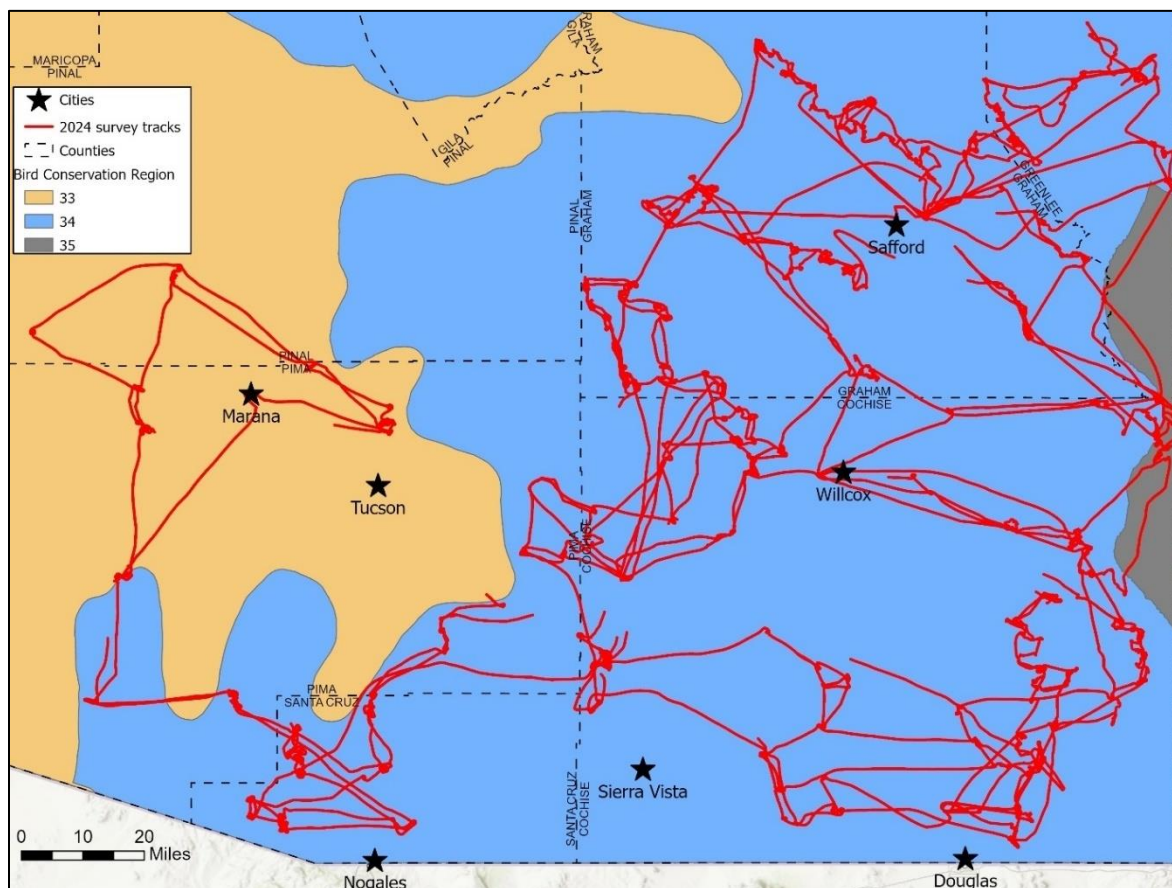


Figure 1. Study area of golden eagle survey flights conducted in Arizona in 2024.

METHODS

We followed operational definitions of breeding status derived from Postupalsky (1974, 1983), Steenhof and Kochert (1982), and Driscoll (2010) (Appendix A). An area was termed a golden eagle breeding area (BA) only if it had been documented as occupied at least once within the last ten years. BAs with no documented occupancy for more than ten years were termed “historic BAs”. However, in many cases a BA 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 without documentation of positive occupancy status were called “potential BAs”. All potential or historic BAs documented as occupied during surveys are reclassified as BAs in future reports. “Large” refers to nests we considered having suitable qualities (e.g., large size and large sticks) for breeding golden eagles based on our experience with bald and golden eagle nests in Arizona (Grubb and Eakle 1987). “Medium” refers to nests that were not likely to have been large enough for golden eagle use and were probable red-tailed hawk (*Buteo jamaicensis*) or common raven (*Corvus corax*) structures.

In 2020, we began a long-term occupancy and productivity monitoring plan for golden eagles, selecting a different region of the state each year and visiting all known nest sites, collecting occupancy and productivity data, and searching for new nests and territories within that region. Over several years, the entire state (excepting tribal lands) will be surveyed. We also incorporated data from the 2011-2019 surveys and considered opportunities to fill in gaps in knowledge of golden eagle distribution and occupancy. Survey efforts were primarily focused on examining all previously discovered large nests and secondarily searching cliff habitat deemed suitable for nesting golden eagles as time allowed.

Although the goal was to survey each BA, historic BA, or potential BA twice, in practice some areas were only surveyed once due to unexpected delays, mechanical or logistical issues, inclement weather, or other factors. When faced with these realities, we prioritized visits to BAs and historic BAs over potential BAs, and sites where at least one golden eagle was detected on prior visits. At some areas there were no existing nests to revisit, and some potential BAs were either considered or confirmed to be territory for nesting hawks rather than eagles and not worthy of using additional flight time to check later in the season.

The first set of surveys occurred in late February to early March to coincide with pre- and early-incubation behavior of golden eagles in Arizona (McCarty et al. 2023). The second round of surveys occurred three to four weeks later (late March to early April) to determine occupancy if it was not observed during the first visit. In order to save time and resources, not all of the sites found with an active nest during the first round of surveys were re-visited in the second round. BAs that were found occupied after one of the first two rounds were visited again in May and/or June as necessary to document the number of young hatched (if any) and reaching at least 80% of fledging age. For golden eagles, measures of 80% of fledging age range from 51-56 days old (7.3-8 weeks) (Kochert et al. 2002, Driscoll 2010, Brown et al. 2013, Pagel et al. 2010). The 80% standard for our assessment was at least 7.5 weeks old although surveys were generally timed for eight weeks old. Golden eagle nestlings were aged following Hoechlin (1976) and Driscoll (2010).

Aerial surveys were conducted on February 20-23 and 26-29; March 1, 19-21, and 26-28; May 13, 15, and 28; and June 5 and 19. Some observations were also made opportunistically during helicopter surveys of bald eagle nests from January to May. A team of two to three biologists completed the surveys from a helicopter (Bell 206L) flown at approximately 60 m (200 ft) above ground level and at 50-80 knots (approximately 60-90 mph), however in June the observations of final nesting status (to document 80% of fledging age) were made via ground visits or fixed-wing aircraft (Cessna A185F, Cessna TU-206, or Quest Kodiak 100). Altitude and speed of aerial surveys were influenced by topography, ground-based obstacles (presence of high-tension wires, meteorological towers, etc.), and wind. Multiple passes were sometimes necessary to accurately document occupancy and productivity. The minimum data recorded for all surveys included occupancy status, number of adults and their behavior, number of eggs (if visible) and/or young, nestling age, and nest condition. Supplemental information included nest characteristics (size, position on cliff, substrate descriptors, etc.), assessment of site for ground access, and observations of other raptor species. The locations of new nests were recorded on Garmin GPSMAP 64s units. Photos were taken of active nests and most other large nests for future reference using a Nikon D610 DSLR camera with a Sigma lens (150-600 mm).

Laying, hatching, and fledging dates were estimated using nestling age (based on plumage development) as a starting point. For this purpose only, the incubation period was considered to take 45 days and age at fledging to be 70 days old. For pairs producing more than one nestling, the average age of the young was used to generate a single set of estimates per active nest. Fledging dates were only estimated for successful sites.

In December 2016, the USFWS changed the scale at which eagle populations are to be evaluated, from Bird Conservation Regions (BCRs) to migratory flyways (USFWS 2016a, b). The change enlarged eagle management units to correspond to the USFWS administrative flyways, with provisions for evaluating effects of take permits at more local levels. In Arizona, the Department has utilized the BCR approach since productivity surveys began in 2015. For the sake of consistency, and since BCRs allow for finer-scale comparison within the state, we continue to reference the BCRs. Arizona includes BCRs 16 (Southern Rockies/Colorado Plateau), 33 (Sonoran and Mohave Deserts), 34 (Sierra Madre Occidental), and 35 (Chihuahuan Desert) (NABCI 2000).

RESULTS

The 2024 golden eagle survey effort totaled 81.7 hours (4,902 minutes) of aerial surveys over 20 days (Appendix B). In total, we surveyed 91 previously-known breeding areas, one historic breeding area, and 62 potential breeding areas at least twice. Additionally, we visited 32 other sites one time only, including two BAs, three historic BAs, and 27 potential BAs. Notable findings included five new breeding areas.

Occupancy was documented at 49 of 96 (51.0%) areas eligible for analysis (i.e., they were surveyed at least twice to determine occupancy and included previously-known BAs, new BAs, and re-occupied historic BAs) (Table 1, Appendix C). Of the 49 occupied areas, 42 (85.7%) were active and 7 were occupied-only (14.3%). A total of 36 nestlings hatched at the 42 active areas,

and 29 young fledged from 24 successful nesting attempts. Excluding two active sites where final status was not determined, productivity was 0.62 young fledged per occupied BA and mean brood size was 1.2 nestlings.

Based on the observation of nestlings that were aged by feather development, we estimated egg-laying and hatching for 30 of the active BAs, and fledging dates for 25 of them (Table 2). Overall, the 2024 average estimated laying date was February 21 (range February 6 to March 15), average hatching date was April 6 (March 22 to April 29), and average fledging date was June 13 (May 31 to July 8). There were no meaningful comparisons of productivity or timing to make between BCRs due to small sample sizes in BCR 33 and 35 (Tables 1 and 2).

Table 1. Summary of Arizona golden eagle productivity in 2024.				
	All areas	BCR 33	BCR 34	BCR 35
Areas surveyed	96	4	89	3
Occupied	49 (51.0%)	1 (25.0%)	47 (52.8%)	1 (33.3%)
Active	42	1	40	1
Failed breeding attempts	16	0	15	1
Successful breeding attempts	24	1	23	0
Young hatched	36	1	35	0
Young fledged	29	1	28	0
Nest success (successful/occupied)	0.49*	1.0	0.51*	0
Mean brood size (fledged/successful)	1.2*	1.0	1.2*	0
Productivity (fledged/occupied)	0.62*	1.0	0.62*	0

*Excludes two active sites where final status was not determined.

Table 2. Estimated average laying, hatching, and fledging dates in 2024.				
Estimated:	All BCRs	BCR 33	BCR 34	BCR 35
Laying date	February 21 (n=30)	March 15 (n=1)	February 20 (n=29)	--
Hatching date	April 6 (n=30)	April 29 (n=1)	April 5 (n=29)	--
Fledging date	June 13 (n=25)	July 8 (n=1)	June 12 (n=24)	--

RESULTS OF NEST SURVEYS

Results worthy of discussion are described below and include surveys in suitable habitat (including new BAs and new potential BAs), surveys in breeding areas (including previously known BAs, potential BAs, and historic BAs), discovery of new nests, and additional golden eagle sightings. Nest locations are sensitive data, considered confidential by the Department, and omitted from this report. Management agencies requiring specific locations should contact the Department's Heritage Data Management System at (623) 236-7618 or hdms@azgfd.gov.

Breeding Areas

A total of 91 previously-known breeding areas were surveyed at least twice and occupancy was confirmed at 44 sites (Table 3). Single golden eagles were observed at nine other sites.

Cochise County

Fisher (5GE036). – On March 28, two golden eagles were perched in the area.

Grassy Hill (5GE049). – On February 23, a golden eagle was incubating in a new nest #11 on a cliff (Figure 2).

Leslie Canyon (5NE142). – On March 21, two golden eagles were seen flying and interacting over the peak, one of which was an immature bird. After the nesting season had concluded, while reviewing photos taken during the survey, we noted a golden eagle had been incubating in a new nest #9 near nest #7 (Figure 2). A second new nest #10 was also found. Since the active nest was not observed during the flight, a follow-up visit was not scheduled and final status was not determined.



Figure 2. Golden eagle incubating at the Grassy Hill breeding area (left) and Leslie Canyon (right).

Mustang Mountains (5NE051). – On February 22, a golden eagle was incubating in a new nest #9 on a cliff (Figure 3).

Orange Butte (5GE017). – On March 28, one golden eagle was perched on a cliff in the nest area. The tall cliffs contained many facets, making it difficult to search, however one new large nest was found #6.

Pedregosa 1 (5GE042). – On February 29, two golden eagles were flying and perching in the area. On May 13, a single golden eagle was seen perched.

Perilla Mountains 1 (5GE044). – On March 28, a golden eagle was incubating in a new nest #11 on a cliff, and a second new large nest was found #12.

Pothole (5GE046). – On March 28, one golden eagle was perched in the area.

San Simon (5NE135). – On March 28, two golden eagles were flying in the area, and a single golden eagle was seen perched on May 13.

Stockton Draw (5NE164). – On February 23, one golden eagle was perched in the area.



Figure 3. Golden eagles at the Mustang Mountains (left) and Teran Basin (right) breeding areas.

Teran Basin (5NE090). – On February 22 and March 20, two golden eagles were standing in nest #2 (Figure 3). No eggs were observed during those visits, and the nest was empty on May 13.

Whetstone Mountains 1 (5NE049). – On February 22 one golden eagle was flying in the area.

Valley View (5GE047). – On February 29, three new large nests were found on cliffs (#4-6).

Graham County

Galiuro Mts 1 (5NE080). – On March 20, one new large nest #6 was found on a cliff.

Galiuro Mts 3 (5NE082). – On March 20, one new large nest #3 was found on a cliff

Galiuro Mts 7 (5NE086). – On March 20, one new large nest #4 was found on a cliff

Galiuro Mts 11 (5NE094). – On March 20, a golden eagle was incubating in a new nest #5 on a cliff (Figure 4), and a second new nest #6 was found nearby.

Gila Mountains 3 (5NE028). – On March 27, one golden eagle was perched in the area.

Javelina Peak (5GE005). – On March 26, one new large nest #13 was found on a cliff.

Santa Teresa Mtns 1 (5NE064). – On March 27, one new large nest #6 was found on a cliff.

Slaughter Mountain (5NE034). – On March 27, a golden eagle was incubating in a new nest #11 on a cliff (Figure 4).

Turtle Mountain 1 (5NE038). – On February 27, one new large nest #11 was found on a cliff.



Figure 4. Golden eagle incubating at the Galiuro Mts 11 (left) and Slaughter Mountain (right) breeding areas.

Turtle Mountain 2 (5NE039). – On February 27, a golden eagle was incubating in a new nest #4 on a cliff (Figure 5).

Weber Peak (5GE008). – All known nests are now considered non-existent. The mining operation here has expanded considerably and the nest cliff has been removed.

Graham/Greenlee County

Peloncillo Mountains 3 (5GE037). – On March 26, a red-tailed hawk was standing in nest #11 (Figure 5), and a new large nest #15 was found on a cliff.



Figure 5. Golden eagle incubating at Turtle Mountain 2 breeding area (left) and red-tailed hawk at Peloncillo Mountains 3 (right).

Greenlee County

Hot Springs Canyon (5GE009). – On March 26, two golden eagles were soaring in the area.

Pima County

Cerro Colorado (5NE097). – On February 20, a golden eagle was flying in the area.

Coyote Mountains (5GE052). – On March 19, a golden eagle was perched in the area.

Mildred Peak (5GE016). – On February 20, a golden eagle was perched in the area, and two new large nests (#4-5) were found on cliffs.

Waterman Mountains (5GE023). – On February 20, one new large nest #6 was found on a cliff. On March 19, a red-tailed hawk was incubating in nest #2, and a prairie falcon was incubating in nest #4 (Figure 6).

Santa Cruz County

Atascosa (5NE096). – On March 19, a golden eagle was perched above a new large nest #6 on a cliff (Figure 6).

Ruby (5NE103). – On February 21, two new large nests (#2-3) were found on cliffs.



Figure 6. Prairie falcon incubating at Waterman Mountains (left) and golden eagle perched at Atascosa breeding area (right).

Table 3. Summary of breeding areas examined during nest surveys in 2024 (continued next page).				
Breeding area	Area ID ¹	Dates surveyed	Status ²	Comments
Cochise County				
Boulder Canyon	5NE041	2/28, 5/13	F	2/28: Golden eagle incubating in nest #1. 5/13: Nest empty, failed.
Bowie Mountain	5NE042	2/28, 3/28, 5/13, 5/28	F	3/28: Golden eagle incubating in nest #5. 5/13: One nestling, 6.5 weeks old. 5/28: Nest empty, failed.
Chiricahua 2	5NE114	2/28, 3/28	U	All known nests empty. No eagles.
Coronado	5NE141	2/29, 3/28	U	All known nests empty. No eagles.
Engine Mountain	5GE003	2/27, 3/28, 5/15	F	3/28: Golden eagle incubating in nest #3. 5/15: Nest empty, failed.
Fisher	5GE036	2/28, 3/28	O	3/28: Two golden eagles perched in area.
Grassy Hill	5GE049	2/23, 5/13, 6/5	S	New nest found, #11. 2/23: Golden eagle incubating in nest #11. 6/5: One nestling, 7.5 weeks old.
Leslie Canyon	5NE142	2/23, 3/21	A	Two new nests found, #9-10. 3/21: Golden eagle incubating in nest #9.

¹Breeding area identification code.

²A=active, F=failed, O=occupied, S=Successful, U=Unoccupied.

Table 3 continued.				
Breeding area	Area ID ¹	Dates surveyed	Status ²	Comments
Little Rincon Mountains	5NE054	2/22, 5/13, 5/28	S	2/22: Golden eagle incubating in nest #1. 5/28: One nestling, 8 weeks old.
Maverick	5GE031	2/28, 5/13	F	2/28: Golden eagle incubating in nest #2. 5/13: Nest empty, failed.
May Day	5NE154	2/29, 5/13, 6/5	S	2/29: Golden eagle incubating in nest #4. 5/13: One nestling, 4+ weeks old. 6/5: One nestling, 7.5 weeks old.
Mule Mountains 1	5GE051	2/23, 3/21	U	All known nests empty. No eagles.
Mustang Mountains	5NE051	2/22, 5/13, 6/5	S	One new nest found #9. 2/22: Golden eagle incubating in new nest #9. 5/13: One nestling 6 weeks old. 6/5: One nestling, 8-8.5 weeks old.
Orange Butte	5GE017	2/28, 3/28	U	All known nests empty. One new nest found #6. 3/28: One golden eagle perched.
Pedregosa 1	5GE042	2/29, 3/21, 5/13	O	2/29: Two golden eagles flying and perching. 5/13: One golden eagle perched.
Pedregosa 2	5GE043	2/29, 3/28	U	All known nests empty. No eagles.
Pedregosa 3	5NE143	2/29, 5/13, 6/5	S	2/29: Golden eagle incubating in nest #1. 5/13: One nestling, 4.5 weeks old. 6/5: One nestling, 8 weeks old.
Peloncillo Mountains	5GE018	2/28, 3/28, 5/15	F	3/28: Golden eagle incubating in nest #11. 5/15: Nest empty, failed.
Peloncillo Mountains 2	5NE023	2/27, 3/28	U	All known nests empty. No eagles.
Peloncillo Mountains 4	5NE109	2/28, 3/28	U	All known nests empty. No eagles.
Perilla Mountains 1	5GE044	2/29, 3/28, 5/13	F	Two new nests found, #11-12. 3/28: Golden eagle incubating in nest #11. 5/13: Nest empty, failed.
Portal	5GE045	2/29, 3/28	U	All known nests empty. No eagles. Red-tailed hawk incubating in nest #8.
Pothole	5GE046	2/29, 3/28	U	All known nests empty. 3/28: One golden eagle perched.
Redrock	5NE130	2/22, 3/20	U	All known nests empty. No eagles.
Saddle Gap	5GE048	2/29, 5/13, 6/5	S	2/29: Golden eagle incubating in nest #13. 5/13: One nestling, 5.5-6 weeks old. 6/5: One nestling, 8.5 weeks old.
San Simon	5NE135	2/28, 3/28, 5/13	O	3/28: Pair of golden eagles flying. 5/13: One golden eagle perched.
Severin Canyon	5GE022	2/22, 3/20	U	All known nests empty. No eagles.
Square Mountain	5GE021	2/22, 5/13, 5/28	S	2/22: Golden eagle incubating in nest #1. 5/13: One nestling, 5.5 weeks old. 5/28: One nestling, 8.5-9 weeks old.
Stockton Draw	5NE164	2/23, 3/21	U	All known nests empty. 2/23: One golden eagle perched.
Swiss 1	5GE040	2/23, 3/21	U	All known nests empty. No eagles.
Swiss 2	5GE041	2/23, 5/13, 5/28	S	2/23: Golden eagle incubating in nest #2. 5/13: One nestling, 6 weeks old. 5/28: One nestling, 7.5-8 weeks old.
Teran Basin	5NE090	2/22, 3/20, 5/13	O	2/22 & 3/20: Pair of golden eagles standing in nest #2.

¹Breeding area identification code.

²A=active, F=failed, O=occupied, S=Successful, U=Unoccupied.

Table 3 continued.				
Breeding area	Area ID ¹	Dates surveyed	Status ²	Comments
Valley View	5GE047	2/29, 3/28	U	All known nests empty. No eagles. Three new nests found, #4-6.
Whetstone Mountains 1	5NE049	2/22, 3/21	U	All known nests empty. 2/22: One golden eagle flying.
Winchester Mountains 2	5NE045	2/22, 3/20, 5/13, 5/28	S	3/20: Golden eagle standing in nest #12. 5/13: Two nestlings, 5.5 weeks old. 5/28: Two nestlings, 8 weeks old.
Wolverine	5GE050	2/23, 5/13	S	2/23: Golden eagle incubating in nest #1. 5/13: One nestling, 7.5 weeks old.
Graham County				
Big Spring Canyon	5GE011	2/26, 3/27	U	All known nests empty. No eagles.
Blue Ridge	5GE024	2/28, 3/27, 5/13	O	3/27: Pair of golden eagles perched.
Bryce Mountain	5GE019	2/26, 5/15, 6/5	S	2/26: Golden eagle incubating in nest #2. 5/15: Two nestlings, 5 weeks old. 6/5: Two nestlings, 7.5-8 weeks old.
Galiuro Mts 1	5NE080	2/22, 3/20	U	One new nest found #6. All known nests empty. No eagles.
Galiuro Mts 3	5NE082	2/22, 3/20	U	One new nest found #3. All known nests empty. No eagles.
Galiuro Mts 7	5NE086	2/22, 3/20	U	One new nest found #4. All known nests empty. No eagles.
Galiuro Mts 9	5NE088	2/22, 3/20	U	All known nests empty. No eagles.
Galiuro Mts 11	5NE094	2/22, 3/20, 5/13	F	Two new nests found, #5-6. 3/20: Golden eagle incubating in nest #5. 5/13: Nest empty, failed.
Gila Mountains 1	5NE025	2/26, 3/27	O	All known nests empty. 2/26: Two golden eagles perched.
Gila Mountains 3	5NE028	2/26, 3/27	U	All known nests empty. 3/27: One golden eagle perched.
Gila Mountains 4	5NE029	2/26, 5/15	F	2/26: Golden eagle incubating in nest #7. 5/15: Nest empty, failed.
Gila Mountains 6	5NE036	2/26, 3/27	U	All known nests empty. No eagles.
Gila Mountains Central	5GE027	2/26, 5/15	S	2/26: Golden eagle incubating in nest #11. 5/15: One nestling, 7+ weeks old.
Gila Peak	6GE007	2/26, 3/27	U	All known nests empty. No eagles.
Javelina Peak	5GE005	2/27, 3/26	U	All known nests empty. No eagles. New nest #13 found.
O-Bar-O	5GE020	2/28, 5/13, 6/5	S	2/28: Golden eagle incubating in nest #1. 5/13: One nestling, 4-4.5 weeks old. 6/5: One nestling, 7.5+ weeks old.
Pinaleno 1	5GE032	2/28, 5/13, 5/28	S	2/28: Golden eagle incubating in nest #1. 5/13: One nestling, 5.5 weeks old. 5/28: One nestling, 8 weeks old.
Pinaleno 2	5GE033	2/8, 3/28	U	All known nests empty. No eagles.
Pinaleno 3	5GE038	2/28, 3/27	U	All known nests empty. No eagles.
Pinaleno 4	5GE039	2/28, 3/27	U	All known nests empty. No eagles.
Pinaleno 9	5NE124	2/28, 3/27	U	Red-tailed hawk incubating in nest #1. No eagles.
Santa Teresa	5GE025	2/28, 3/27	U	All known nests empty. No eagles.

¹Breeding area identification code.

²A=active, F=failed, O=occupied, S=Successful, U=Unoccupied.

Table 3 continued.				
Breeding area	Area ID ¹	Dates surveyed	Status ²	Comments
Santa Teresa Mtns 1	5NE064	2/28, 3/27	U	One new nest found #6. All known nests empty. No eagles.
Santa Teresa Mtns 5	5NE068	2/28, 3/27, 5/13, 6/18	F	3/27: Golden eagle incubating in nest #2. 5/13: One nestling, 2-3 weeks old. 6/18: Nest empty, failed.
Slaughter Mountain	5NE034	2/26, 3/27, 5/15, 5/28	S	One new nest found #11. 3/27: Golden eagle incubating in new nest #11. 5/15: One nestling, 7 weeks old. 5/28: One nestling, 8.5-9 weeks old.
Slick Rock	5NE107	2/27, 3/26	U	All known nests empty. No eagles.
Turtle Mountain 1	5NE038	2/27, 5/15	F	One new nest found #11. 2/27: Golden eagle incubating in nest #3. 5/15: Nest empty, failed.
Turtle Mountain 2	5NE039	2/27, 5/15	S	One new nest found #4. 2/27: Golden eagle incubating in nest #4. 5/15: One nestling, 7.5 weeks old.
Weber Peak	5GE008	2/26, 3/27	U	All known nests non-existent. Mining operation has expanded considerably and the cliff has been removed.
Whitlock Mountains 3	5NE021	2/27, 5/15	F	2/27: Golden eagle incubating in nest #9. 5/15: Nest empty, failed.
Winchester Mountains 4	5NE047	2/22, 5/13, 5/28	A	2/22: Golden eagle incubating in nest #5. 5/13: One nestling, 6+ weeks old. 5/28: Nest empty. Unable to determine if fledged or failed.
Winchester Mountains 5	5NE048	2/22, 3/20	U	All known nests empty. No eagles.
Graham/Greenlee County				
Peloncillo Mountains 3	5GE037	2/27, 3/26	U	3/26: Red-tailed hawk standing in nest #11. No eagles. One new nest found #15.
Greenlee County				
Bear Canyon	5GE010	2/27, 3/26	U	All known nests empty. No eagles.
Dix Mesa	1NE034	2/27, 3/26	U	All known nests empty. No eagles.
Hackberry	1NE027	3/26, 5/15	S	3/26: Golden eagle incubating in nest #3. 5/15: Two nestlings, 7.5 weeks old.
Harden Creek	1GE057	2/27, 5/15, 6/5	S	2/27: Golden eagle incubating in nest #3. 5/15: Two nestlings, 4.5-5 weeks old. 6/5: Two nestlings, 7.5+ weeks old.
Hot Springs Canyon	5GE009	2/27, 3/26	O	All known nests empty. 3/26: Two golden eagles soaring.
Palace	5NE106	2/27, 5/15, 6/5	F	2/27: Golden eagle incubating in nest #3. 5/15: Two nestlings, 4.5 weeks old. 6/5: Nest empty, failed.
San Francisco River 2	1NE033	2/27, 5/15, 6/5	S	2/27: Golden eagle incubating in nest #1. 5/15: One nestling, 5-5.5 weeks old. 6/5: One nestling, 8+ weeks old.
Twin Peaks	5GE007	2/27, 5/15, 6/5	F	2/27: Golden eagle incubating in nest #2. 5/15: One nestling, 5.5 weeks old. 6/5: Nestling dead in nest.
Pima County				
Cerro Colorado	5NE097	2/20, 3/19	U	All known nests empty. 2/20: One golden eagle flying.

¹Breeding area identification code.

²A=active, F=failed, O=occupied, S=Successful, U=Unoccupied.

Table 3 continued.				
Breeding area	Area ID ¹	Dates surveyed	Status ²	Comments
Cochie Canyon	5NE017	2/20, 3/19, 5/13, 6/18	S	3/19: Golden eagle incubating in nest #5. 5/13: One nestling, 2 weeks old. 6/18: One nestling, 7.5 weeks old.
Coyote Mountains	5GE052	2/20, 3/19	U	All known nests empty. 3/19: One golden eagle perched.
Fagan 1	5GE029	2/21, 3/19	U	All known nests empty. No eagles. Two new nests found, #8-9.
Fagan 2	5GE030	2/21, 3/19	U	All known nests empty. No eagles.
Martinez	5NE116	2/22, 3/20	U	All known nests empty. No eagles.
Mildred Peak	5GE016	2/20, 3/19	U	All known nests empty. Two new nests found, #4-5. 2/20: One golden eagle perched.
Pusch Ridge Wilderness 1	5NE061	2/20, 3/19	U	All known nests empty. No eagles.
Waterman Mountains	5GE023	2/20, 3/19	U	One new nest found #6. Red-tailed hawk incubating in nest #2. Prairie falcon incubating in nest #4. No eagles.
Whetstone Mountains 3	5GE035	2/22, 5/13, 5/28	S	2/22: Golden eagle incubating in nest #1. 5/13: One nestling, 6-6.5 weeks old. 5/28: One nestling, 8.5+ weeks old.
Santa Cruz County				
Agua Caliente 1	5GE028	2/21, 3/19	U	All known nests empty. No eagles.
Atascosa	5NE096	2/21, 3/19	U	One new nest found #6. All known nests empty. 3/19: One golden eagle perched.
Cayenne	5NE172	2/21, 5/13, 5/28	S	2/21: Golden eagle incubating in nest #4. 5/13: Two nestlings, 6 weeks old. 5/28: One nestling, 8+ weeks old.
Montana	5GE053	2/21, 3/19, 5/13, 6/18	F	3/19: Golden eagle incubating in nest #1. 5/13: One nestling, 2 weeks old. 6/18: Nest empty, failed.
Ruby	5NE103	2/21, 5/13, 5/28	S	Two new nests found, #2-3. 2/21: Golden eagle incubating in nest #1. 5/13: One nestling, 6-8 weeks old. 5/28: Presumed fledged.
Tumacacori 2	5GE034	2/20, 3/19	U	All known nests empty. No eagles.

¹Breeding area identification code.

²A=active, F=failed, O=occupied, S=Successful, U=Unoccupied.

Historic Breeding Areas

Four historic breeding areas were surveyed at least once (Table 4). Occupancy was not confirmed at any of the sites.

Graham County

Markham Creek (5NE035). – On March 27, a red-tailed hawk was incubating in nest #2.

Table 4. Summary of historic breeding areas surveyed in 2024.				
Historic breeding area	Area ID ¹	Dates surveyed	Status ²	Comments
Cochise County				
Old Horseshoe Canyon	5GE004	2/27	--	All known nests empty. No eagles.
Graham County				
Markham Creek	5NE035	2/26, 3/27	U	Red-tailed hawk incubating in nest #2. No eagles.
Tollgate Canyon	5GE006	2/27	--	All known nests empty. No eagles.
Greenlee County				
Black Hills	5GE012	2/27	--	All known nests empty. No eagles.

¹Breeding area identification code.

²U=Unoccupied, --=Undetermined (only one visit).

Potential Breeding Areas

A total of 62 previously documented potential BAs were surveyed at least twice (Table 5). Five of the sites were found occupied for the first time and will be designated as breeding areas in future reports. Single golden eagles were observed at five other sites. An additional 27 potential BAs were surveyed only once. Only the occupied areas and eagle sightings are included below.

Cochise County

Chiricahua 3 (5NE131). – On March 28, a golden eagle was flying in the area.

Madrono (5NE134). – On March 28, a golden eagle was flying in the area.

Whetstone Mountains 2 (5NE050). – On March 21, a golden eagle was incubating in nest #1 (Figure 7), representing the first time occupancy has been documented at this site since it was discovered in 2012. On May 13, the nest was empty and the attempt failed.

Graham County

Galiuro Mts 8 (5NE087). – On March 20, a golden eagle was incubating in nest #5, representing the first time occupancy has been documented at this site since it was discovered in 2012. One nestling was observed at three weeks old on May 13 (Figure 7) and 8.5 weeks old on June 18.



Figure 7. Golden eagle incubating at Whetstone Mountains 2 (left) and nestling at Galiuro Mts 8 (right).

Oliver Knoll (5NE030). – On March 27, one golden eagle was perched in the area.

Peloncillo Mountains 6 (5NE127). – On February 27, a golden eagle was incubating in nest #1 (Figure 8), representing the first time occupancy has been documented at this site since it was discovered in 2014. On May 15, the nest was empty and the attempt failed.

Greenlee County

Hackberry (1NE027). – On March 26, a golden eagle was incubating in nest #3, representing the first time occupancy has been documented at this site since it was discovered in 2018. On May 15, two 7.5-week old nestlings were standing on a ledge next to the nest (Figure 8).



Figure 8. Golden eagle incubating at Peloncillo Mountains 6 (left) and nestlings at Hackberry (right).

Pima County

Arrowhead (5NE115). – On March 20, a golden eagle was standing in nest #1 (Figure 9).

Santa Cruz County

Cayenne (5NE172). – On February 21, a golden eagle was incubating in nest #4, representing the first time occupancy has been documented at this site since it was discovered in 2020. Two nestlings, 6 weeks old, were in the nest on May 13 (Figure 9), and one 8-week old nestling was standing in the nest on May 28.

Grosvenor (5NE099). – On March 19, a golden eagle was perched in the area.



Figure 9. Golden eagle at Arrowhead (left) and nestlings at Cayenne (right).

Table 5. Summary of potential breeding areas examined during nest surveys in 2024. ¹				
Potential breeding area	Area ID ²	Dates surveyed	Status ³	Comments
Cochise County				
Chiricahua 3	5NE131	3/28	N1	All known nests empty. One golden eagle flying.
Madrono	5NE134	3/28	N1	All known nests empty. One golden eagle flying.
Whetstone Mountains 2	5NE050	2/21, 3/21, 5/13	F	3/21: Golden eagle incubating in nest #1. 5/13: Nest empty, failed.
Graham County				
Galiuro Mts 8	5NE087	2/22, 3/20, 5/13, 6/18	S	3/20: Golden eagle incubating in nest #5. 5/13: One nestling 3+ weeks old. 6/18: One nestling, 8.5 weeks old.
Oliver Knoll	5NE030	3/27	N1	All known nests empty. One golden eagle perched.
Peloncillo Mountains 6	5NE127	2/27, 5/15	F	2/27: Golden eagle incubating in nest #1. 5/15: Nest empty, failed.
Greenlee County				
Hackberry	1NE027	3/26, 5/15	S	3/26: Golden eagle incubating in nest #3. 5/15: Two nestlings, 7.5 weeks old.
Pima County				
Arrowhead	5NE115	3/20	N1	One golden eagle standing in nest #1.
Santa Cruz County				
Cayenne	5NE172	2/21, 5/13, 5/28	S	2/21: Golden eagle incubating in nest #4. 5/13: Two nestlings, 6 weeks old. 5/28: One nestling 8+ weeks old.
Grosvenor	5NE099	3/19	N1	One golden eagle perched.

¹Only includes sites that were occupied or where a single golden eagle was seen.

²Area identification code.

³F=failed, N1=One golden eagle and at least one large nest observed, S=successful.

Surveys in Suitable Nesting Habitat

No new potential BAs were documented during in 2024. The survey area contained hundreds of nests associated with breeding areas and potential breeding areas, leaving little time to search additional habitat for new nests. However, 40 new large nests were found as alternates within known areas.

DISCUSSION

The observed occupancy of BAs surveyed in 2024 (51.0%) was slightly below the average of 53.3% in occupancy and productivity surveys since 2015 (Table 6). As usual, we caution that our observed occupancy rates are likely lower than reality in part due to reliance on aerial surveys and the associated difficulty in detecting resident eagles that do not lay eggs. For example, McIntyre (2002) found an overall occupancy rate of 83.0% (ranging from 69.7% to 93.4%) in a long-term study of golden eagles in Alaska using a combination of foot, dogsled, and helicopter.

Productivity at our surveyed areas in 2024 (0.62) was slightly above the average of 0.57 from 2015-2023 (Table 6), excluding 2020 when the COVID-19 pandemic interrupted our ability to survey. Other studies have reported higher mean annual brood size and productivity than seen in our Arizona results (Table 7), however productivity in Arizona varies according to BCR. Since

2015, productivity was 0.50 in BCR 34 (n=262 occupied breeding areas), 0.61 in BCR 33 (n=88), and 0.72 in BCR 16 (n=130).

Nesting chronology data was combined from the 2015-2019 and 2021-2024 surveys to help fine-tune the planning of future efforts. Statewide, the average estimated laying date is February 21 (n=240, range January 25 to March 23), hatching is April 6 (n=240, range March 11 to May 7), and fledging is June 15 (n=204, range May 20 to July 16) (Figure 10). Estimates of laying, hatching, and fledging dates were based on the observed plumage development of nestlings. Nesting attempts that failed prior to hatching were excluded from laying estimates.

Currently in Arizona there are 365 known golden eagle BAs, 56 historic BAs, and 483 potential BAs, excluding those that occur on Native American lands (Table 9, Figure 11).

	2015	2016	2017	2018	2019	2020 ^a	2021	2022	2023	2024
BAs examined	87	100	102	101	112	68	93	95	44	96
Number occupied	45	67	61	47	70	42	48	25	23	49
Percent occupied	51.7	67.0	59.8	46.5	62.5	61.8	51.6	26.3	52.3	51.0
Active	42	58	49	33	59	--	44	18	21	42
Failed attempts	17	19	16	20	26	--	30	6	8	16
Successful attempts	25	39	33	13	33	--	14	12	13	24
Young hatched	34	59	50	24	47	--	24	16	16	36
Young fledged	28	52	44	19	39	--	16	14	14	29
Nest success	0.56	0.58	0.54	0.28	0.47	--	0.29	0.48	0.57	0.49 ^b
Mean brood size	1.12	1.33	1.33	1.46	1.18	--	1.14	1.16	1.08	1.21 ^b
Productivity	0.63	0.78	0.72	0.40	0.56	--	0.33	0.56	0.61	0.62 ^b

^aIn 2020, the COVID-19 pandemic prevented aerial surveys and collection of data from occurring after April 2.

^bExcludes two active sites where final status was not determined.

Study	State	Years	Mean annual brood size	Brood size range	Mean annual productivity	Productivity range
This study (2015-2024) ^a	AZ	9	1.22	1.08 - 1.46	0.58	0.33 – 0.78
McIntyre 2002	AK	12	1.45	1.13 - 1.68	0.68	0.16 - 1.16
Phillips et al. 1990	MT/WY	11	1.30	1.1 - 1.8	0.78	0.37 - 1.50
Steenhof et al. 1997	ID	24	1.56	1.0 - 2.0	0.79	0.16 - 1.38
Phillips and Beske 1990	WY	5	1.48	1.33 - 1.65	0.81	0.52 - 1.16
Thompson et al. 1982	OR	16	1.70	1.42 - 2.0	1.08	0.20 - 1.67
Millsap 1981 ^b	AZ	2	1.58	--	1.25	--

^aExcluding 2020.

^bBrood size=per active nest.

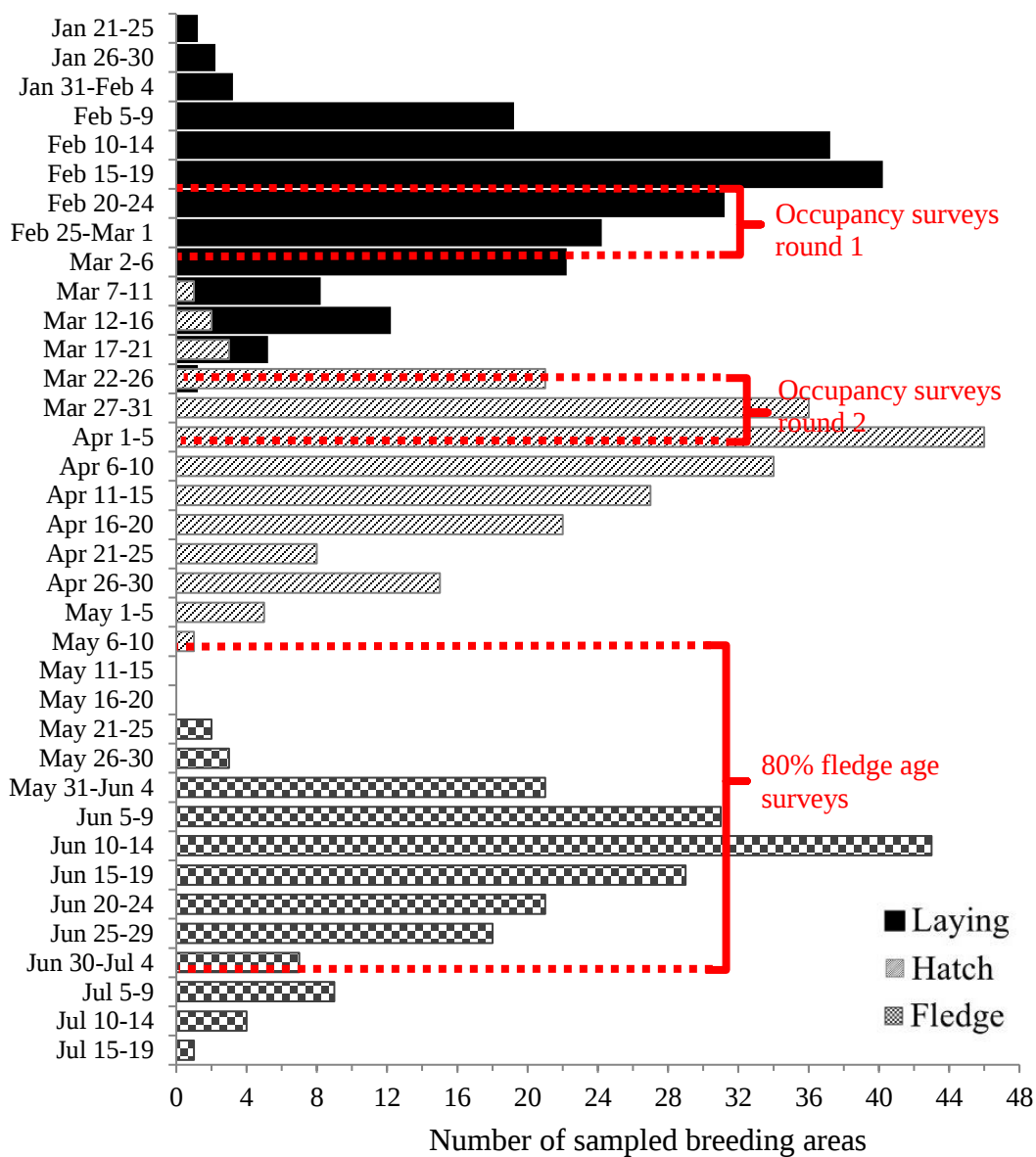


Figure 10. Estimated laying, hatching, and fledging dates at sampled golden eagle breeding areas 2015-2019, and 2021-2024 including recommended timing for future aerial surveys.

Table 8. Number of current, historic, and potential golden eagle breeding areas, and large nests within potential BAs, by Bird Conservation Region in Arizona as of 2024.			
BCR number	Current BAs	Historic BAs	Potential BAs
16	90	14	82
33	76	14	186
34	196	27	215
35	3	1	--
Total	365	56	483

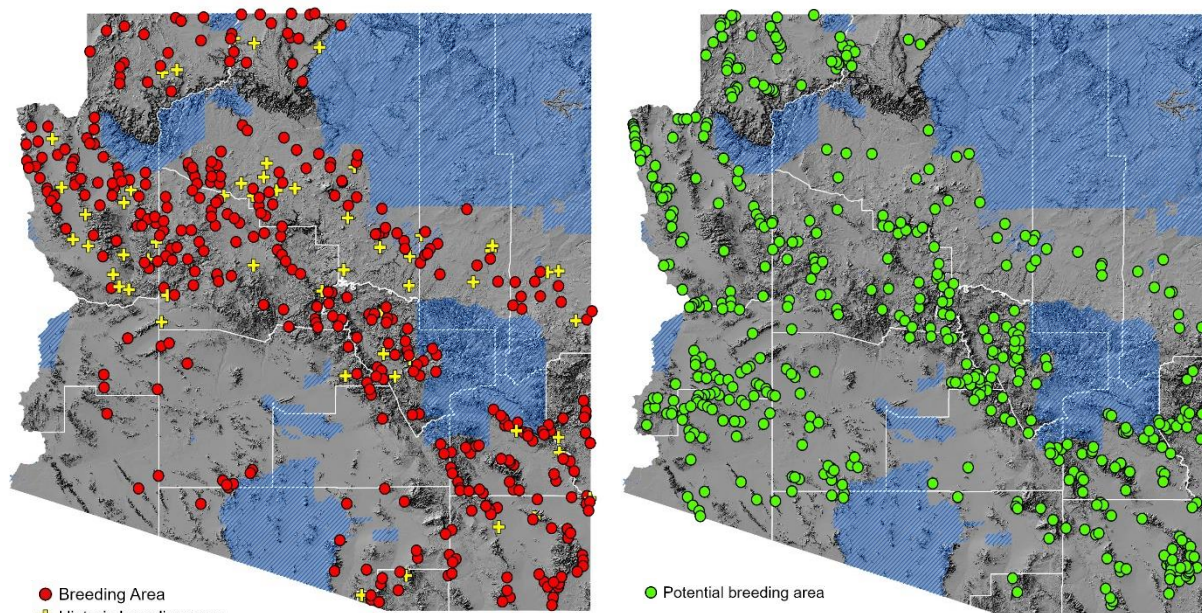


Figure 11. Maps of current and historic golden eagle breeding areas (left) and potential breeding areas (right) in Arizona, excluding Native American lands (blue shaded). County lines in white.

MANAGEMENT RECOMMENDATIONS

1. Future survey efforts should incorporate segments of suitable habitat within each of Arizona's three main BCR's that have not been fully explored:
 - a. In BCR 16, the Grand Wash Cliffs north of Grand Canyon, Andrus Canyon, Kanab Creek and tributaries (Grama and Hack Canyons), Kaibab Plateau, Saddle Mountain Wilderness Area, Marble Canyon, Grand Canyon National Park.
 - b. In BCR 33, portions of Yuma Proving Ground, Barry M. Goldwater Range (West), Organ Pipe National Monument, Cabeza Prieta National Wildlife Refuge, and Buckskin, Dome Rock, Eagletail, Gila Bend, Rawhide, and Trigo Mountains.
 - c. In BCR 34, portions of the Superstition Wilderness, southern Tonto National Forest, Coconino National Forest (Sedona area), Coronado National Forest (including portions of Atascosa, Chiricahua, Huachuca, Patagonia, Pinaleno, Santa Catalina, and Santa Rita Mountains), and Apache-Sitgreaves National Forest (Greenlee County; San Francisco and Blue Rivers).
2. Partner with tribes and Department of Defense to conduct nest inventory or occupancy surveys to fill in gaps of golden eagle breeding distribution.
3. Incorporate limited ground surveys into the monitoring plan to supplement aerial surveys. Observations from the ground would be especially beneficial January through March to detect occupancy.

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APPENDIX A: TERMINOLOGY AND RAPTOR REPRODUCTIVE STATUS CRITERIA

Breeding Area (BA): An area containing one or more nests within the range of a mated pair of birds displaying occupancy as described below. 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., ten consecutive years unoccupied).

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 a 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: A nest 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 nests at which none of the activity patterns diagnostic of occupancy were observed in a given breeding season. At least two visits are required with 30 days between visits in order to designate the site as unoccupied. Sites must have existed as occupied before they can be recognized and classified as an unoccupied BA.

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

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.

Nest success: The number of successful nesting attempts per occupied BA.

Mean brood size: The number of young produced per successful breeding attempt.

APPENDIX B: AREAS SURVEYED FOR GOLDEN EAGLES IN 2024

Table 9. Summary of survey areas and survey time in 2024.			
Date	Duration (hours)	Counties	Locations surveyed
2/20	4.3	Pima, Pinal, Santa Cruz	Cerro Colorado Mountains, Coyote Mountains, Mildred Peak, Picacho Mountains, Santa Catalina Mountains, Silver Bell Mountains, Tortolita Mountains, Tumacacori Mountains, Waterman Mountains, Wildcat Peak.
2/21	2.8	Cochise, Pima, Santa Cruz	Atascosa Mountains, Coronado National Forest, Grosvenor Hills, San Cayetano Mountains, Santa Rita Mountains, Tumacacori Mountains, Whetstone Mountains.
2/22	6.1	Cochise, Pima, Graham	Galiuro Mountains, Johnny Lyon Hills, Little Dragoon Mountains, Little Rincon Mountains, Rincon Mountains, Whetstone Mountains, Winchester Mountains.
2/23	2.3	Cochise	Dragoon Mountains, Escabrosa Ridge, Hay Mountain, Mule Mountains, Pedregosa Mountains, Swisshelm Mountains, Turquoise Mountain.
2/26	2.3	Graham	Gila Mountains.
2/27	5.0	Cochise, Graham, Greenlee	Apache National Forest, Black Hills, Bonita Creek, Eagle Creek, Gila River, Peloncillo Mountains, San Francisco River, Turtle Mountain, Whitlock Mountains.
2/28	6.2	Cochise, Graham	Chiricahua Mountains, Dos Cabezas Mountains, Fisher Hills, Peloncillo Mountains, Pinaleño Mountains, Santa Teresa Mountains.
2/29	5.4	Cochise	Chiricahua Mountains, Pedregosa Mountains, Perilla Mountains.
3/19	5.7	Pima, Santa Cruz	Atascosa Mountains, Cerro Colorado Mountains, Coronado National Forest, Coyote Mountains, Grosvenor Hills, Mildred Peak, Picacho Mountains, Santa Catalina Mountains, Santa Rita Mountains, Tumacacori Mountains, Waterman Mountains.
3/20	4.6	Pima, Graham, Cochise	Galiuro Mountains, Johnny Lyon Hills, Little Dragoon Mountains, Little Rincon Mountains, Rincon Mountains, Winchester Mountains.
3/21	3.3	Cochise	Dragoon Mountains, Escabrosa Ridge, Hay Mountain, Mule Mountains, Pedregosa Mountains, Swisshelm Mountains, Turquoise Mountain, Whetstone Mountains.
3/26	3.0	Graham, Greenlee	Apache National Forest, Black Hills, Bonita Creek, Eagle Creek, San Francisco River, Whitlock Mountains.
3/27	5.2	Graham	Gila Mountains, Pinaleño Mountains, Santa Teresa Mountains.
3/28	5.3	Cochise, Graham	Chiricahua Mountains, Pedregosa Mountains, Perilla Mountains, Pinaleño Mountains, Peloncillo Mountains.
5/13	5.6	Cochise, Graham	Chiricahua Mountains, Dos Cabezas Mountains, Little Rincon Mountains, Mustang Mountains, Pedregosa Mountains, Perilla Mountains, Pinaleño Mountains, Santa Teresa Mountains, Swisshelm Mountains, Winchester Mountains.
5/15	2.2	Cochise, Graham	Apache National Forest, Gila Mountains, Peloncillo Mountains, San Francisco River, Turtle Mountain, Whitlock Mountains.
5/28	5.0	Cochise, Graham, Santa Cruz	Chiricahua Mountains, Coronado National Forest, Gila Mountains, Little Rincon Mountains, Peloncillo Mountains, San Cayetano Mountains, Swisshelm Mountains, Whetstone Mountains, Winchester Mountains.
6/5	4.4	Cochise, Graham, Greenlee	Apache National Forest, Chiricahua Mountains, Gila Mountains, Mule Mountains, Mustang Mountains, Perilla Mountains, San Francisco River.
6/19	3.0	Graham, Pima, Santa Cruz	Coronado National Forest, Galiuro Mountains, Santa Teresa Mountains, Tortolita Mountains.

APPENDIX C: 2024 GOLDEN EAGLE PRODUCTIVITY

Table 10. Arizona golden eagle breeding area productivity, 2024 (continued next page).								
Area ID	Nest	Status	Incubation Range	Eggs	Hatch Range	Hatched	Fledge Range	Fledged
1GE057	3	S	<2/27	2	2/27-5/15	2	>6/5	2
1NE027	3	S	<3/26	2	3/26-5/15	2	>5/15	2
1NE033	1	S	<2/27	1	2/27-5/15	1	>6/5	1
1NE034	--	U	All known nests empty. No eagles.					
2GE031	1	F	1/29-4/1	1	Failed 4/1-4/29.			
2GE049	6	A	1/29-4/1	1	4/1-4/29	1	No survey after 4/29.	
2NE058	--	U	All known nests empty. No eagles.					
3GE017	--	U	All known nests empty. No eagles.					
3GE061	4	S	<6/13	1	<6/13	1	>6/13	1
3NE093	1	S	<5/14	1	<5/14	1	>5/14	1
4NE066	8	O	3/10: Adult GOEA in nest possibly incubating or brooding (not confirmed).					
4NE068	1	S	<3/10	1	3/31-6/9	1	>6/9	1
5GE003	3	F	2/27-3/28	1	Failed 3/28-5/15.			
5GE005	--	U	All known nests empty. No eagles.					
5GE007	2	F	<2/27	1	2/27-5/15	1	Failed 5/15-6/5.	
5GE008	--	U	All known nests empty. No eagles.					
5GE009	--	O	3/26: Two golden eagles soaring.					
5GE010	--	U	All known nests empty. No eagles.					
5GE011	--	U	All known nests empty. No eagles.					
5GE018	11	F	2/28-3/28	1	Failed 3/28-5/15.			
5GE019	2	S	<2/26	2	2/26-5/15	2	>6/5	2
5GE020	1	S	<2/28	1	2/28-5/13	1	>6/5	1
5GE021	1	S	<2/22	1	2/22-5/13	1	>5/28	1
5GE022	--	U	All known nests empty. No eagles.					
5GE023	--	U	Red-tailed hawk incubating in nest #2. No eagles.					
5GE024	--	O	3/27: Pair of golden eagles perched.					
5GE025	--	U	All known nests empty. No eagles.					
5GE027	11	S	<2/26	1	2/26-5/15	1	>5/15	1
5GE028	--	U	All known nests empty. No eagles.					
5GE029	--	U	All known nests empty. No eagles.					
5GE030	--	U	All known nests empty. No eagles.					
5GE031	2	F	<2/28	1	Failed 2/28-5/13.			
5GE032	1	S	<2/28	1	2/28-5/13	1	>5/28	1
5GE033	--	U	All known nests empty. No eagles.					
5GE034	--	U	All known nests empty. No eagles.					
5GE035	1	S	<2/22	1	2/22-5/13	1	>5/28	1
5GE036	--	O	3/28: Two golden eagles perched.					
5GE037	--	U	All known nests empty. No eagles.					
5GE038	--	U	All known nests empty. No eagles.					
5GE039	--	U	Red-tailed hawk incubating in area od nest #3. No eagles.					
5GE040	--	U	All known nests empty. No eagles.					
5GE041	2	S	<2/23	1	2/23-5/13	1	>5/28	1
5GE042	--	O	2/29: Two golden eagles flying around and perching.					

¹Breeding area identification code.

²A=active, F=failed; S=successful; O=occupied; U=unoccupied.

³Represents minimum number of eggs laid.

Table 10 continued.								
Area ID	Nest	Status	Incubation Range	Eggs	Hatch Range	Hatched	Fledge Range	Fledged
5GE043	--	U	All known nests empty. No eagles.					
5GE044	11	F	2/29-3/28	1	Failed 3/28-5/13.			
5GE045	--	U	All known nests empty. No eagles.					
5GE047	--	U	All known nests empty. No eagles.					
5GE048	13	S	<2/29	1	2/29-5/13	1	>6/5	1
5GE049	11	S	<2/23	1	2/23-5/13	1	>6/5	1
5GE050	2	S	<2/23	1	2/23-5/13	1	>5/13	1
5GE051	--	U	All known nests empty. No eagles.					
5GE053	1	F	2/21-3/19	1	3/19-5/13	1	Failed 5/13-6/18.	
5NE017	5	S	2/20-3/19	1	3/19-5/13	1	>6/18	1
5NE019	--	U	All known nests empty. No eagles.					
5NE021	9	F	<2/27	1	Failed 2/27-5/15.			
5NE022	--	U	All known nests empty. No eagles.					
5NE023	--	U	All known nests empty. No eagles.					
5NE024	--	U	All known nests empty. No eagles.					
5NE025	--	O	2/26: Two golden eagles perched near nest #3.					
5NE026	--	U	All known nests empty. No eagles.					
5NE027	--	U	All known nests empty. No eagles.					
5NE029	1	F	<2/26	1	Failed 2/26-5/15.			
5NE032	--	U	All known nests empty. No eagles.					
5NE033	--	U	Red-tailed hawk incubating in nest #1. No eagles.					
5NE034	11	S	2/26-3/27	1	3/27-5/15	1	>5/28	1
5NE035	--	U	Red-tailed hawk incubating in nest #2. No eagles.					
5NE036	--	U	All known nests empty. No eagles.					
5NE038	3	F	<2/27	1	Failed 2/27-5/15.			
5NE039	4	S	<2/27	1	2/27-5/15	1	>5/15	1
5NE041	1	F	<2/28	1	Failed 2/28-5/13.			
5NE042	5	F	2/28-3/28	1	3/28-5/13	1		0
5NE043	--	U	All known nests empty. No eagles.					
5NE045	12	S	2/22-3/20	2	3/20-5/13	2	>5/28	2
5NE046	--	U	All known nests empty. No eagles.					
5NE047	5	A	<2/22	1	2/22-5/13	1	Final status unconfirmed.	
5NE048	--	U	All known nests empty. No eagles.					
5NE050	1	F	2/21-3/21	1	Failed 3/21-5/13.			
5NE051	9	S	<2/22	1	2/22-5/13	1	>6/5	1
5NE052	--	U	All known nests empty. No eagles.					
5NE053	--	U	All known nests empty. No eagles.					
5NE054	1	S	<2/22	1	2/22-5/13	1	>5/28	1
5NE056	--	U	All known nests empty. No eagles.					
5NE058	--	U	All known nests empty. No eagles.					
5NE061	--	U	All known nests empty. No eagles.					
5NE062	--	U	All known nests empty. No eagles.					
5NE063	--	U	All known nests empty. No eagles.					
5NE064	--	U	All known nests empty. No eagles.					
5NE065	--	U	All known nests empty. No eagles.					

¹Breeding area identification code.

²A=active, F=failed; S=successful; O=occupied; U=unoccupied.

³Represents minimum number of eggs laid.

Table 10 continued.								
Area ID	Nest	Status	Incubation Range	Eggs	Hatch Range	Hatched	Fledge Range	Fledged
5NE066	--	U	All known nests empty. No eagles.					
5NE067	--	U	All known nests empty. No eagles.					
5NE068	2	F	2/28-3/27	2	3/27-5/13	1	Failed 5/13-6/18.	
5NE069	--	U	All known nests empty. No eagles.					
5NE080	--	U	All known nests empty. No eagles.					
5NE082	--	U	All known nests empty. No eagles.					
5NE083	--	U	All known nests empty. No eagles.					
5NE084	--	U	All known nests empty. No eagles.					
5NE085	--	U	All known nests empty. No eagles.					
5NE086	--	U	All known nests empty. No eagles.					
5NE087	5	S	2/22-3/20	1	3/20-5/13	1	>6/18	1
5NE088	--	U	All known nests empty. No eagles.					
5NE090	--	O	3/20: Two golden eagles standing in nest #2.					
5NE091	--	U	All known nests empty. No eagles.					
5NE092	--	U	All known nests empty. No eagles.					
5NE093	--	U	All known nests empty. No eagles.					
5NE094	5	F	2/22-3/20	1	Failed 3/20-5/13.			
5NE095	--	U	All known nests empty. No eagles.					
5NE098	--	U	All known nests empty. No eagles.					
5NE100	--	U	All known nests empty. No eagles.					
5NE101	--	U	All known nests empty. No eagles.					
5NE103	1	S	<2/21	1	2/21-5/13	1	>5/13	1
5NE105	--	U	All known nests empty. No eagles.					
5NE106	3	F	<2/27	2	2/27-5/15	2	Failed 5/15-6/5.	
5NE107	--	U	All known nests empty. No eagles.					
5NE108	--	U	All known nests empty. No eagles.					
5NE109	--	U	All known nests empty. No eagles.					
5NE111	--	U	All known nests empty. No eagles.					
5NE112	--	U	All known nests empty. No eagles.					
5NE113	--	U	All known nests empty. No eagles.					
5NE114	--	U	All known nests empty. No eagles.					
5NE116	--	U	All known nests empty. No eagles.					
5NE120	--	U	All known nests empty. No eagles.					
5NE122	--	U	All known nests empty. No eagles.					
5NE124	--	U	All known nests empty. No eagles.					
5NE127	1	F	<2/27	1	Failed 2/27-5/15.			
5NE129	--	U	All known nests empty. No eagles.					
5NE130	--	U	All known nests empty. No eagles.					
5NE132	--	U	All known nests empty. No eagles.					
5NE133	--	U	All known nests empty. No eagles.					
5NE135	--	O	3/28: Pair of golden eagles flying, territorial.					
5NE137	--	U	All known nests empty. No eagles.					
5NE138	--	U	All known nests empty. No eagles.					
5NE141	--	U	All known nests empty. No eagles.					
5NE142	9	A	2/23-3/21	1	No surveys after 3/21.			

¹Breeding area identification code.

²A=active, F=failed; S=successful; O=occupied; U=unoccupied.

³Represents minimum number of eggs laid.

Table 10 continued.								
Area ID	Nest	Status	Incubation Range	Eggs	Hatch Range	Hatched	Fledge Range	Fledged
5NE143	1	S	<2/29	1	2/29-5/13	1	>6/5	1
5NE145	--	U	Red-tailed hawk incubating in nest #1. No eagles.					
5NE150	--	U	All known nests empty. No eagles.					
5NE154	4	S	<2/29	1	2/29-5/13	1	>6/5	1
5NE160	--	U	All known nests empty. No eagles.					
5NE163	--	U	All known nests empty. No eagles.					
5NE165	--	U	All known nests empty. No eagles.					
5NE166	--	U	All known nests empty. No eagles.					
5NE167	--	U	All known nests empty. No eagles.					
5NE171	--	U	All known nests empty. No eagles.					
5NE172	4	S	<2/21	2	2/21-5/13	2	>5/28	2
5NE173	--	U	All known nests empty. No eagles.					
5NE174	--	U	All known nests empty. No eagles.					
5NE177	--	U	All known nests empty. No eagles.					
5NE178	--	U	All known nests empty. No eagles.					
6GE002	8	S	<3/6	1	3/6-4/23	1	>4/23	1
6GE007	--	U	All known nests empty. No eagles.					
6GE062	1	F	3/6-4/1	1	Failed 4/23-5/28.			

¹Breeding area identification code.

²A=active, F=failed; S=successful; O=occupied; U=unoccupied.

³Represents minimum number of eggs laid.