# ARIZONA BALD EAGLE MANAGEMENT PROGRAM
# 2022 SUMMARY REPORT

Kyle M. McCarty, Eagle Field Projects Coordinator
Jennifer K. Presler, Birds and Mammals Biologist
Kenneth V. Jacobson, Raptor Management Coordinator

*Photo by Sam Rector*

Technical Report 355
Nongame and Endangered Wildlife Program
Terrestrial Wildlife Branch
Wildlife Management Division
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086
December 2022

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## PROJECT FUNDING

Funding for this project was provided by: Arizona Game and Fish Department's Heritage Fund; Arizona Public Service; Pittman-Robertson Funds (U.S. Fish and Wildlife Service); Salt River Pima-Maricopa Indian Community; Salt River Project; Scorpion Bay Marina; U.S. Bureau of Land Management; U.S. Department of Defense (Luke Air Force Base); U.S. Forest Service (Apache-Sitgreaves, Kaibab, Prescott, and Tonto National Forests); and Verde Canyon Railroad.

## Recommended Citation

McCarty, K.M., J.K. Presler, and K.V. Jacobson. 2022. Arizona bald eagle management program 2022 summary report. Nongame and Endangered Wildlife Program Technical Report 355. Arizona Game and Fish Department, Phoenix, Arizona.

## Acknowledgments

The authors acknowledge and appreciate the assistance of the following people: Arizona Department of Transportation; Mathew Downs and Nicole Rodriguez, Arizona Public Service; James Knotts, Arizona State Parks Department; Arizona Army National Guard; City of Phoenix; Forest Highlands Golf Club; Mark Frank and Karen Shaw, Fort McDowell Yavapai Nation; Woodrow Crumbo and Samuel Rector, Gila River Indian Community; The Hopi Tribe; Jan Miller, Joe Miller, Megan Mosby, and Alex Stofko, Liberty Wildlife Rehabilitation Foundation; Rudy Bowen, Jennifer Johnston, Pete McCormick, and Jennifer Waller, Maricopa County Parks and Recreation Department; Kristen Philbrook, National Park Service; Leanna Begay and Brent Powers, Navajo Nation Department of Fish and Wildlife; Chelsea Atwater, Josh Coplan, Zach Heesh, Billy Nugent, Papillon Helicopters, Inc.; Gina Leverette-Mason and Victoria Olmstead, Salt River Pima-Maricopa Indian Community; Rob Ackerman, Nina Grimaldi, Julie Keith, Shea Meyer, Jose Navarro, Nick Quevedo, Lesly Swanson, and Ruth Valencia, Salt River Project; Daniel Juan, San Carlos Apache Tribe; Tonto Apache Tribe; Tiffany Shepherd, U.S. Air Force (Luke Air Force Base); Mike Vissichelli, U.S. Army Corps of Engineers; Chip Lewis, U.S. Bureau of Indian Affairs; Elroy Masters, U.S. Bureau of Land Management; Carol Evans and Nichole Olsker, U.S. Bureau of Reclamation; Greg Beatty, Efren Chavez, Shaula Hedwall, Kammie Kruse, Tamara Kurey, Kirsten McDonnell, and Mary Richardson, U.S. Fish and Wildlife Service; Janie Agyagos, Christina Akins, Camden Bruner, Charles Denton, Natasha Douglas, Jarrod Elmer, Noel Fletcher, Damon Haan, Kelly Kessler, Travis Largent, Ariel Leonard, Loren LeSueur, Charles Stocksdale, Bonnie Woods, U.S. Forest Service; Teresa Propeck, and Ellen Roberts, Verde Canyon Railroad; Cynthia Dale, White Mountain Apache Tribe; Donna Bailloux, James Driscoll, Cheyenne Dubiach, Dan Groebner, Sharon Lashway, Jeff Meyers, Susi MacVean, Gloria Morales, and Tim Snow, Arizona Game and Fish Department. A special thanks goes out to the winter count surveyors and coordinators for their hard work and dedication, and to volunteers and local supporters Gordo Douglas, Cindi Hall, Melanie Herring, Claudia Kirscher, Dennis McTighe, Marta Peddie, and Bill Waldron.

This report, in part, summarizes the results of monitoring by the Arizona Bald Eagle Nestwatch Program using the breeding area reports submitted in 2022. Those include: Leticia Cruz-Paredes and Eduardo Martinez-Leyva, Box Bar, Woods Canyon, and Scholz Lake Breeding Areas (BAs); Karl Garrett and Tyler Obermeit, Pleasant and Cataract BAs; Russell Seeley and Andrea Tews, Concho BA; Alayna Coulter and Owen Baxter, Bachelor Cove BA; Joe and Marta Peddie, Luna and Greer Lakes BA; Kurt Anderson and Scott Mill, Goldfield BA; Bethany Adams and Julia Clickard, Orme BA; Jennifer Ottinger and Parisa Ardekani, Rodeo, Doka, Fort McDowell and Sycamore BAs.

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# ARIZONA BALD EAGLE MANAGEMENT PROGRAM 2022 SUMMARY REPORT

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## INTRODUCTION

In 1978, the U.S. Fish and Wildlife Service (USFWS) listed the bald eagle (*Haliaeetus leucocephalus*) as endangered under the Endangered Species Act (ESA), as amended (1973), in 43 states including Arizona and threatened in five others (USFWS 1982). The species was not listed in Alaska and it does not occur in Hawaii. The USFWS downlisted the bald eagle to threatened in 1995 and delisted the species in 2007 (USFWS 1995, 2007a).

Bald eagles in central Arizona were temporarily designated as a Distinct Population Segment (DPS) and listed as threatened in 2008 due to a court order requiring a 12-month status review of the Sonoran Desert Area population (USFWS 2008). As a result of the status review, the USFWS determined the population did not satisfy the definition of a DPS and was therefore not eligible for listing (USFWS 2010). Bald eagles in the Sonoran Desert Area were removed from the list of endangered and threatened species in 2011 (USFWS 2011). Further legal challenges resulted in a subsequent 12-month finding which supported the previous conclusions (USFWS 2012a). The 2012 finding was upheld by a U.S. District Court in 2014, and that decision was affirmed by an appellate court in 2017.

The bald eagle remains protected in the state under Arizona Revised Statute Title 17 and nationally under the Bald and Golden Eagle Protection Act (Eagle Act), Migratory Bird Treaty Act, Lacey Act, Airborne Hunting Act, and the Convention on International Trade in Endangered Species of Wild Flora and Fauna. Along with delisting from the ESA, the USFWS revised the Eagle Act to codify the definition of "disturb" (USFWS 2007b) and finalize regulations to provide a mechanism to authorize take of eagles and eagle nests under limited circumstances (USFWS 2009). For implementation of take permits to be compatible with the Eagle Act, take must be "consistent with the goal of stable or increasing breeding populations." In the Southwest, take thresholds are extremely limited. In April 2012, the USFWS proposed revisions to eagle take permits which would have extended programmatic permits to a maximum of 30 years (USFWS 2012b), a rule which was challenged in court and overturned. As a result, the USFWS developed a new rule in 2016 to reinstate a 30-year permit and included other revisions to take permit implementation (USFWS 2016, 2017).

The Southwestern Bald Eagle Management Committee (SWBEMC) was formed in 1984 by land and wildlife management agencies to enhance coordination, increase communication, and provide oversight for Arizona bald eagle management. In 2007, 2014, and 2020 some members of the SWBEMC signed the Conservation Assessment and Strategy for Bald Eagles in Arizona (CAS), which described strategies for continuing management post-delisting (Driscoll et al. 2006). The CAS also specified threats facing bald eagles in Arizona and identified actions necessary to maintain their distribution and abundance in the state. Today, the SWBEMC consists of 28 members, with the Arizona Game and Fish Department (Department) as the lead implementation agency for bald eagle management projects. This report covers the 2022 results for the following

projects: Arizona Bald Eagle Winter Count, Occupancy and Reproductive Assessment, Nest Survey, and Arizona Bald Eagle Nestwatch Program.

## STUDY AREA

Nest monitoring and surveys were conducted statewide, and Arizona bald eagle breeding areas (BAs) were located within eight biotic communities (Brown 1994, The Nature Conservancy 2004): Sonoran Desertscrub (n=52 BAs) [includes Arizona Upland Subdivision (n=45) and Lower Colorado River Valley Subdivision (n=7)], Rocky Mountain (Petran) Montane Conifer Forest (n=19), Plains and Great Basin Grasslands (n=8), Semidesert Grassland (n=7), Interior Chaparral (n=3), Great Basin Conifer Woodland (n=3), Mohave Desertscrub (n=1), and Subalpine Grassland (n=1). Other biotic communities visited included Chihuahuan Desertscrub and Madrean Evergreen Woodland.

A majority of the 95 bald eagle BAs in 2022 occurred at elevations at or below 3,000 ft (914 m) (55.3%, n=53), and were located primarily in central Arizona within the riparian areas of the Sonoran Riparian Scrubland and Sonoran Interior Strands as described in Brown (1994) (Figure 1). Fewer BAs were at elevations between 3,001 and 6,000 ft (915 to 1,829 m) (17.0%, n=16) or above 6,000 ft (>1,829 m) (27.7%, n=26). Representative riparian vegetation at lower elevations included Fremont cottonwood (*Populus fremonti*), Goodding willow (*Salix gooddingii*), Arizona sycamore (*Platanus wrightii*), and nonnative salt cedar (*Tamarix* spp.), with surrounding uplands of the Sonoran Desertscrub-Arizona Upland subdivision, Interior Chaparral, Semidesert Grassland and Great Basin Conifer Woodland. These upland areas are commonly vegetated with blue palo verde (*Parkinsonia florida*), mesquite (*Prosopis* spp.), ironwood (*Olneya tesota*), saguaro (*Carnegiea gigantea*), teddy bear cholla (*Cylindropuntia bigelovii*), juniper (*Juniperus* spp.), and pinyon pine (*Pinus edulis*).

In northwestern Arizona, two bald eagle BAs (Black Canyon and Nevada Bay) were located adjacent to the Colorado River within Mohave Desertscrub, where riparian vegetation was similar and uplands included creosote bush (*Larrea tridentata*), blackbrush (*Coleogyne ramosissima*), saltbush (*Atriplex spp.*), catclaw acacia (*Acacia sp.*), and a variety of cacti (e.g. silver cholla, *Cylindropuntia echinocarpa*). However, at the Black Canyon BA, the eagle pair has only built a nest on the Nevada side of the river and is not included in regular monitoring by the Department. Grassland communities contained a suite of mixed grasses and vegetation such as grama (*Bouteloua spp.*), agave (*Agave spp.*), yucca (*Yucca spp.*), and prickly pear cacti (*Opuntia spp.*), with degrees of invasion by scrubs, shrubs, and nonnative plants. In these areas, bald eagle nests occurred in stands of cottonwoods, ponderosa pine (*Pinus ponderosa*), or riverine cliffs. At higher elevations, BAs were found in Rocky Mountain Montane Conifer Forest dominated by ponderosa pine, where riparian vegetation included narrow-leaf cottonwood (*Populus angustifolia*), thin-leaf alder (*Alnus tenuifolia*), Bebb's willow (*Salix bebbiana*), and coyote willow (*S. exigua*) (Brown 1994). Interior Chaparral included pinyon-juniper woodlands, shrub live oak (*Quercus turbinella*), and pointed (*Arctostaphylos pungens*) and pringle manzanita (*A. pringlei*).

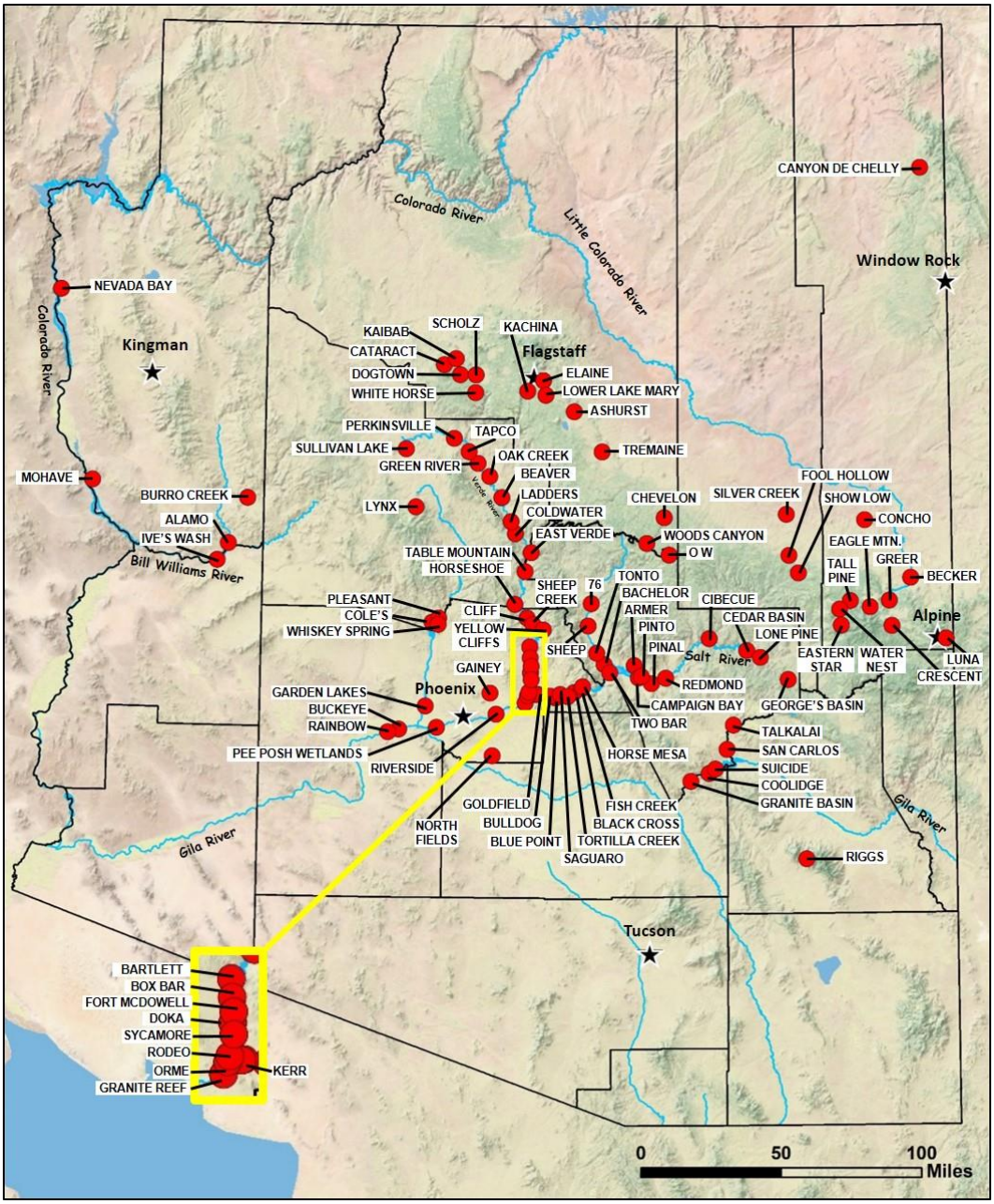


*Figure 1. Location of known bald eagle breeding areas in Arizona, 2022.*

With some exceptions, the majority of bald eagles in Arizona nested within a mile of water sources providing sufficient foraging opportunities for fish or waterfowl. However, distance to water within some BAs may vary between years depending on fluctuating creek or lake levels (e.g., Alamo Lake and Roosevelt Lake) and the distance of alternate nests. Terrestrial prey comprises an important dietary proportion at some BAs, most notably Gunnison's prairie dogs (*Cynomys gunnisoni*) at Canyon de Chelly, Concho, and Silver Creek, and may also influence habitat selection. Several BAs are located in the Phoenix metropolitan area and include disrupted or highly modified riparian communities, primarily consisting of artificial water formations such as recharge basins, urban ponds and lakes, and canals.

In 2022, BAs were located along: Burro, Canyon, Cibecue, Moon, Oak, Pinal, Silver, Tonto, and Walnut creeks; Alamo, Apache, Ashurst, Bartlett, Canyon, Cataract, Chevelon Canyon, Crescent, Dogtown, Fool Hollow, Greer, Horseshoe, Kaibab, Lower Lake Mary, Luna, Lynx, Pleasant, Riggs, Roosevelt, Saguaro, San Carlos, Scholz, Show Low, Talkalai, Tremaine, White Horse, and Woods Canyon lakes or reservoirs; and the Agua Fria, Bill Williams, Black, Colorado, Little Colorado, Gila, North Fork White, Salt, San Carlos, San Francisco, and Verde rivers. Nests within these drainages are usually on cliff ledges, rock pinnacles, and in cottonwood or ponderosa pine trees. However, they have also occurred in sycamore, juniper, pinyon pine, willow, eucalyptus (*Eucalyptus sp.*), mesquite, and snags, as well as artificial structures and saguaro cactus (Grubb 1980, Hunt et al. 1992, McCarty and Jacobson 2012, McCarty et al. 2018, McCarty et al. 2020).

## ARIZONA BALD EAGLE WINTER COUNT

### INTRODUCTION

National winter surveys are an effective tool to monitor bald eagles throughout their range (Millsap 1986, Stalmaster 1987, Eakle et al. 2015). The knowledge of wintering bald eagle habitat use allows for the consideration and implementation of management actions to protect important wintering areas. Even though the USFWS delisted the species nationwide in 2007, the importance of the national winter count persists. Through each state's consistent efforts, the winter count will continue to provide post-delisting data on national population trends and help to ensure implementation of Eagle Act permits remain compatible with stable or increasing populations (Steenhof et al. 2002, 2008; Eakle et al. 2015).

The National Wildlife Federation (NWF) initiated and organized the national midwinter bald eagle count from 1979-1992. From 1992-2007, coordination shifted among the Bureau of Land Management (BLM), the National Biological Survey, and then the U.S. Geological Survey (USGS). Since 2008, the U.S. Army Corps of Engineers (ACE) has coordinated the national winter count effort. Arizona participated in the program from the 1970s to the early 1980s (Todd 1981). However, in 1986 the national coordinators changed the survey protocol to only count areas of high bald eagle concentrations (routes with more than 15 bald eagles observed in two or more years). Due to Arizona's lack of "concentrations", minimal information was contributed in 1986 and 1987, and surveys only occurred in specific management areas in 1989-1991 such as Roosevelt Lake and Nankoweap Creek (Brown and Stevens 1992).

Arizona's statewide winter counts resumed in 1992 using a combination of terrestrial (foot, snowmobile, vehicle), boat, and aircraft surveys. In 1995, the Department and NWF established 115 standardized routes for Arizona's bald eagle winter count. In 2005, after 10 years of surveying the 115 established routes, we analyzed the data to eliminate those routes that did not meet USGS standards and to include new routes for future surveys. If a route produced three or fewer birds during the previous 10 years of surveys, the route was dropped per USGS guidance. As a result, in 2006 we removed 23 and added 12 new routes to the survey for a net result of 104 standardized routes. Additionally, in order to simplify reporting of data to ACE we dropped two more routes in 2008, Lake Mead and Lake Mohave, for a total of 102 standardized routes. These routes covered

areas along the Colorado River both in Arizona and Nevada, and are reported by the state coordinators of the Nevada Winter Raptor Survey. Finally, starting in 2020 we added two new winter count sites (Buckhead Mesa Landfill and Point of Pines aerial) that have been surveyed for the past four years and that had at least three bald eagles seen during one or more surveys, bringing the total number of standardized routes back up to 104 (Figure 2).

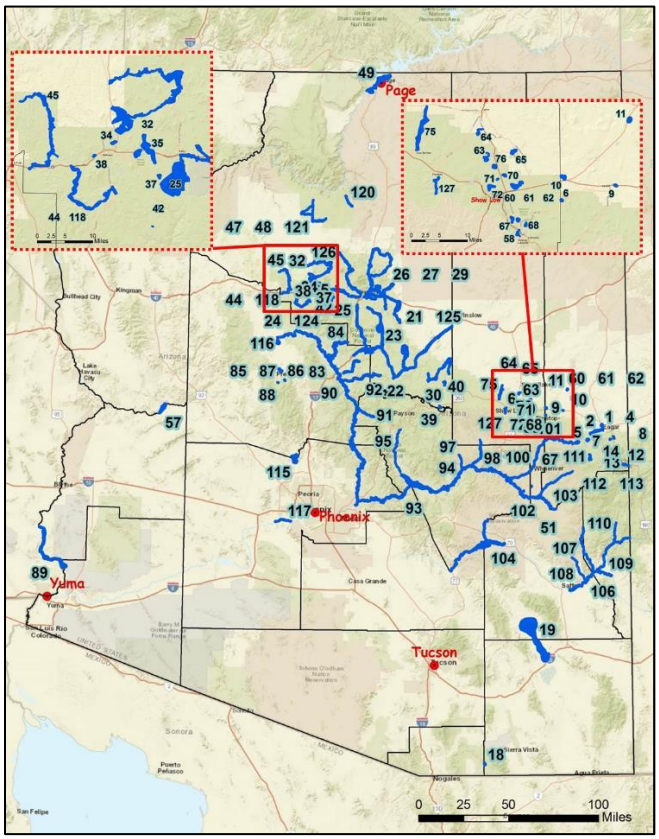


*Figure 2. Map of the Arizona Bald Eagle Winter Count survey routes (blue outlines). County lines in black. See Appendix A for the associated route names.*

## METHODS

We continued to use, and strived to complete, the established standardized survey routes for the 2022 Arizona bald eagle winter count. Additionally, five non-standard routes were completed and integrated into this document for management purposes and were included as non-standard routes in the results submitted to the ACE. We scheduled the winter count for January 8 to 14, 2022, which included weekdays for agency personnel and a weekend for volunteers. The short survey period minimized the chance for any large-scale bald eagle movements between survey routes and related duplicate counts.

We used a variety of survey methods due to the diverse habitats in Arizona and our desire to maximize (but not duplicate) statewide coverage in a narrow period with minimal effort. The most effective method to survey Arizona's remote terrain and the deep canyons of linear drainages was by helicopter. The U.S. Bureau of Reclamation (USBR) and Salt River Project (SRP) contributed

a total of four days of helicopter time for 2-3 biologists and a pilot to fly 26 of the winter count routes. The helicopter's altitude and speed were dependent upon terrain, height, occurrence of power lines, and wind speed. In general, a height of 31-61 m (100-200 ft) above ground level and 55-65 knots (63-75 mph) was typical for surveys. Highways, large lakes, and point counts were surveyed by boats, vehicles, and on foot. We solicited surveyors from cooperating agencies and volunteers from private groups, supplied survey forms, and instructed participants on the National Survey Protocol.

We classified bald eagle sightings into adult and immature age classes. In addition, we included sightings of unknown-age bald eagles and unidentified eagles in our totals to maintain consistency with the national count. We advised the volunteers to be aware of the various near-adult plumages as they may be easily mistaken for full adult bald eagles. Sightings of golden eagles (*Aquila chrysaetos*) and other raptors were also recorded during the survey, but are not reported in this document. We divided the data presented below into two sections for comparison: 1) the terrestrial and boat survey by county and 2) the helicopter survey by drainage or lake (Appendix A).

Due to our refinement of the statewide winter count routes in 2005, four counties are no longer surveyed by ground methods for wintering bald eagles, including Greenlee, Maricopa, Pima, and Pinal counties. However, portions of Greenlee, Maricopa, and Pinal counties were covered by the helicopter flights. Additionally, the one route representing Graham County was not surveyed in multiple years. This route is now being covered by air to ensure completion.

## RESULTS AND DISCUSSION

The 2022 Arizona bald eagle winter count tallied 248 bald eagles, including 174 adults (70.2%), 63 subadults (25.4%), and 11 unknown eagles (4.4%). Participants covered 95 of 104 standardized routes (91%) with a total survey effort of 9,111 minutes (151.9 hours) (Tables 1 and 2). An additional four non-standard routes were surveyed for a total of two bald eagles (Appendix A). The highest total number of bald eagles observed during ground surveys occurred in Coconino County (n=28 routes, 51 eagles) (Table 1), and the largest concentration on a single ground survey occurred near Show Low in Navajo County (14 eagles) (Appendix A). A large number of bald eagles (n=56) was also observed by helicopter along the Salt River and associated drainages.

The total of 248 bald eagles in 2022 was slightly higher than the average of 243 birds observed annually during standardized counts (Table 2), and the age composition of this year's count (70% adult, 25% subadult) approximated the average ratio of adults to subadults in Arizona's winter counts since 2005. In addition to documenting bald eagle sightings, winter count surveyors are asked each year to rate the general weather conditions compared to previous years as being either very mild, mild, normal, harsh, or very harsh. Of those that rated the weather conditions (n=91), most responded that this year's weather was either normal (63%) or mild (30%), followed by very mild (7%) and harsh (1%). There were no responses for very harsh weather. Similarly, of those that rated ice cover (n=91), most responded that it was normal (68%), followed by less than normal (16%), more than normal (9%), much less than normal (5%), and much more than normal (1%) ice cover.

Table 1. Summary of the Arizona bald eagle winter count 2022.

| Survey areas | Routes | Minutes (Hours) | Adults | Subadults | Unknown[1] | Total | Total/ Hr. |
|---|---|---|---|---|---|---|---|
| Apache County | 14 | 926 (15.4) | 7 | 5 | 0 | 12 | 0.8 |
| Cochise County | 2 | 182 (3.0) | 1 | 0 | 0 | 1 | 0.3 |
| Coconino County | 28 | 4,208 (70.1) | 33 | 13 | 5 | 51 | 0.7 |
| Gila County | 1 | 45 (0.8) | 10 | 2 | 0 | 12 | 15.0 |
| Graham County | Not surveyed by ground. | | | | | | |
| Mohave County | 1 | 106 (1.8) | 4 | 0 | 0 | 4 | 2.2 |
| Navajo County | 15 | 657 (11.0) | 12 | 11 | 6 | 29 | 2.6 |
| Santa Cruz County | 1 | 60 (1.0) | 0 | 0 | 0 | 0 | 0 |
| Yavapai County | 6 | 1,985 (33.1) | 12 | 5 | 0 | 17 | 0.5 |
| Yuma & La Paz County | 1 | 120 (2.0) | 1 | 0 | 0 | 1 | 0.5 |
| Verde River drainage | 3 | 155 (2.6) | 27 | 7 | 0 | 34 | 13.1 |
| Salt River drainage | 9 | 403 (6.7) | 44 | 12 | 0 | 56 | 8.4 |
| Gila River drainage | 8 | 205 (3.4) | 11 | 1 | 0 | 12 | 3.5 |
| Various helicopter | 6 | 59 (1.0) | 12 | 7 | 0 | 19 | 19.0 |
| Totals | 95 | 9,111 (151.9) | 174 | 63 | 11 | 248 | 1.6 |

[1] Unknown age bald eagles and unidentified eagles.

Table 2. Summary of Arizona bald eagle winter counts 2005-2022.

| Year | Survey time (min) | Surveys completed | Adults | Subadults | Unknown[1] | Total eagles | Eagles / hour |
|---|---|---|---|---|---|---|---|
| 2005 | 8,910 | 97 (84%) | 153 (68%) | 56 (25%) | 15 (7%) | 224 | 1.5 |
| 2006[2] | 10,074 | 104 (100%) | 239 (74%) | 77 (24%) | 7 (2%) | 323 | 1.9 |
| 2007 | 11,632* | 100 (96%) | 192 (68%) | 81 (29%) | 8 (3%) | 281 | 1.4 |
| 2008[3] | 9,362 | 96 (94%) | 152 (82%) | 29 (16%) | 4 (2%) | 185 | 1.2 |
| 2009 | 9,357 | 94 (92%) | 139 (68%) | 62 (30%) | 3 (2%) | 204 | 1.3 |
| 2010 | 9,138* | 96 (94%) | 159 (63%) | 81 (32%) | 12 (5%) | 252 | 1.7 |
| 2011 | 8,713* | 93 (91%) | 157 (71%) | 57 (26%) | 8 (4%) | 222 | 1.5 |
| 2012 | 10,320 | 100 (98%) | 189 (63%) | 94 (32%) | 15 (5%) | 298 | 1.7 |
| 2013 | 9,902* | 98 (96%) | 169 (66%) | 76 (30%) | 10 (4%) | 255 | 1.5 |
| 2014 | 9,325 | 98 (96%) | 188 (71%) | 77 (29%) | 1 (0.4%) | 266 | 1.7 |
| 2015 | 8,989 | 93 (91%) | 141 (69%) | 53 (26%) | 10 (5%) | 204 | 1.4 |
| 2016 | 8,814 | 98 (96%) | 161 (65%) | 71 (29%) | 17 (7%) | 249 | 1.7 |
| 2017 | 9,522 | 101 (99%) | 169 (65%) | 84 (32%) | 8 (3%) | 261 | 1.6 |
| 2018 | 9,045 | 101 (99%) | 172 (70%) | 63 (26%) | 9 (4%) | 244 | 1.6 |
| 2019[4] | 6,645 | 79 (77%) | 137 (65%) | 74 (35%) | 1 (0.5%) | 212 | 1.9 |
| 2020[5] | 9,377* | 99 (95%) | 176 (66%) | 78 (29%) | 12 (5%) | 266 | 1.7 |
| 2021 | 8,963 | 73 (70%) | 130 (73%) | 45 (25%) | 2 (1%) | 177 | 1.2 |
| 2022 | 9,111 | 95 (91%) | 174 (70%) | 63 (25%) | 11 (4%) | 248 | 1.6 |
| Average | 9,289 | 95 (92%) | 167 (69%) | 68 (28%) | 9 (4%) | 243 | 1.6 |

[1]Unknown age bald eagles and unidentified eagles.
[2]Beginning of 104 standardized routes derived from the analysis of 1995-2005 surveys.
[3]Beginning of 102 standardized routes with Lake Meade and Lake Mohave routes dropped.
[4]Federal government shutdown affected survey effort and number of eagles.
[5]Beginning of 104 standardized routes after addition of two new routes.
*Some survey times not recorded. Times averaged from reported times of previous counts.

### MANAGEMENT RECOMMENDATIONS

1. Maintain the current 104 standardized routes.
2. Continue to assess non-standardized routes and add new routes for areas with consistent sightings of more than four bald eagles. Previously, the national coordinators required at least four years of data before a route was included in trend analyses, although highly productive routes are added to the Department's database.
3. Compile spatial data from winter count survey maps to document the location and abundance of wintering bald eagles, identify important habitat use areas, and develop statewide maps for distribution to cooperating agencies.
4. Continue to collect data on other wintering raptors along survey routes in addition to eagles, and investigate the potential to standardize methods for wintering raptor data collection with other states and organizations.
5. Work with partners and volunteers to improve route coverage, especially in underrepresented areas of the state.
6. Investigate assigning new routes in nontraditional bald eagle wintering locations in urban areas.

## OCCUPANCY AND REPRODUCTIVE ASSESSMENT AND NEST SURVEY

### INTRODUCTION

The Occupancy and Reproductive Assessment (ORA) and nest surveys enhance our understanding of breeding bald eagle ecology in Arizona. Discovery of new BAs and alternate nests within BAs, coupled with the knowledge of current and historical BAs, allows for an accurate description of the distribution, status, and annual productivity of the breeding population in Arizona. Timely discovery of BAs and alternate nests also helps the SWBEMC to identify sensitive areas requiring proactive management to prevent potentially adverse impacts.

In 1972, concern about bald eagle population declines nationwide prompted surveys for the species throughout Arizona (Rubink and Podborny 1976). These annual surveys have continued to the present, excluding 1976 and 1977 (e.g. Glinski 1985, Hildebrandt and Glinski 1987, McCarty et al. 2018). The Department administered and performed the 2022 surveys in cooperation with the SWBEMC.

### METHODS

We monitored breeding activity at current and historic BAs, nest sites discovered between 1992 and 2021, and also investigated reports of bald eagles and nests by other agencies, biologists, and the public. Outside of known BAs, the presence of large nests, habitat quality, previous sightings of bald eagles, and spacing between BAs prioritized survey effort. A two to three-person team conducted surveys between January and June 2022. Winter count flights (January), and ORA flights (February to May), were used to locate nests and search for new BAs. Timing of the ORA flights corresponded with the timing of different breeding stages (incubation, hatching, nestling, and fledging).

Helicopters, provided or funded by Arizona Public Service (APS), SRP, and USBR, were flown at approximately 60 meters (200 ft) above ground level and at 50-60 knots (58-70 mph). Drainage topography, ground-based obstacles (high-tension wires, meteorological towers), and wind influenced altitude and speed. If nest occupancy could not be determined from the air, a ground survey ensued. Boats and off-road vehicles were also used to access survey areas. We used Questar® spotting scopes (40-160x), binoculars (10x), handheld GPS units, and nest map atlases from Hunt et al. (1992) and SRP (2020), to survey and relocate historic BAs and find alternate nests in existing BAs. New nests were numbered consecutively according to the last number assigned within that BA as reported in previous Arizona bald eagle nest survey reports (e.g. McCarty et al. 2021).

Determination of breeding status followed operational definitions derived from Postupalsky (1974, 1983), Steenhof and Kochert (1982), and Driscoll (2010) (Appendix B). Additionally, we used the terms "tall" and "short" in this section to describe heights of cliffs, and "large" and "small" to describe the size of trees and nests. "Tall" and "large" refer to substrates and nests we deemed suitable for breeding bald eagles as compared to current bald eagle nests and locations in Arizona (e.g., Grubb and Eakle 1987). The terms "small" and "short" refer to structures and nests of inadequate height and size. A "nest site" refers to a nest of large size (unless otherwise noted) in appropriate bald eagle habitat that has not been documented as having been built or used by bald eagles, but which is routinely monitored for its potential to be utilized by eagles.

Due to the increase in the number and proximity of BAs in the last decade, some territories have been segmented into multiple smaller territories as pairs of eagles move in and create occupancies. Breeding area names are assigned to each of the new segments. In the event of a reduction in the number of occupied BAs, leaving one pair in an area previously occupied by two or more pairs, then occupancy status will be assigned to the breeding area that existed first.

## RESULTS

All known BAs (n=95) were examined at least once for breeding activity. Although 75 BAs were occupied, one active BA (Cibecue) was excluded from productivity calculations since the final outcome was unknown. Of the remaining 74 occupied BAs, 62 were active and 39 pairs successfully produced 61 fledglings (Table 3; Appendix C) for productivity of 0.82 statewide. For 45 BAs where nestlings were aged by feather development, the average egg laying date was estimated as January 27 (ranging from December 15 to March 16), and average hatch date was estimated as March 3 (ranging from January 19 to April 20). Laying and hatch dates were earlier at lower elevations, averaging January 12 and February 16 respectively at BAs below 3,000 ft (914 m) (n=23), January 29 and March 5 at BAs from 3,000 to 6,000 ft (914 to 1,829 m) (n=8), and February 18 and March 25 at BAs above 6,000 ft (n=14).

Noteworthy findings of the 2022 nest survey included three new bald eagle BAs (Eastern Star, Riggs, and Tall Pine), five new alternate nests within BAs (Doka #9, Green River #2, Lone Pine #9, Sullivan Lake #2, and White Horse #9), 10 fallen nests within BAs (Bill Williams #4, Doka #7, Granite Reef #2, Green River #1, Lone Pine #6, Luna #1, Lynx #7, Sullivan Lake #3, Sycamore #6, and Tonto #9), and 11 new potential nests at seven sites (Black Canyon Lake #1, Ister Flat #1,

North Fork 3 #1, North Fork 4 #1, North Fork 5 #1-2, Santa Fe #1-2, and Willow Springs Lake #13-15).

Table 3. Summary of Arizona bald eagle productivity 2022.

| | | | |
|---|---|---|---|
| Number of BAs | 95 | Number of Active BAs | 62[1] |
| Number of Occupied BAs | 74[1] | Number of Failed Breeding Attempts | 24 |
| Number of Eggs (minimum) | 104 | Number of Successful Breeding Attempts | 39 |
| Nest Success = 39/74 | 0.53 | Number of Young Hatched | 78 |
| Mean Brood Size = 61/39 | 1.6 | Number of Young Fledged[1] | 61 |
| | | Productivity[1] = 61/74 | 0.82 |

[1]One active site was not included where success or failure was not confirmed (Cibecue).

## DISCUSSION

Statewide productivity at Arizona bald eagle BAs in 2022 was 0.82 young fledged per occupied BA, with some differences in elevations and river systems. Most of this year's 74 occupied BAs (those with known final status) were at low elevations (at or below 3,000 ft.) compared to middle (3,001-6,000 ft.) and high elevations (>6,000 ft.). Productivity was above the statewide average at the low elevation sites (0.88, n=40; fledged 35), below average at the middle elevation sites (0.64, n=11; fledged 7), and average at the high elevation sites (0.83, n=23; fledged 19).

There were also differences in productivity between sites along the Salt and Verde Rivers, which together supported 40.5% of this year's occupied BAs. Productivity was above the statewide average along the Verde River (0.93, n=15; fledged 14), and was higher at BAs on the regulated portions of the river (1.1, n=8; fledged 9) and lower on the unregulated portion (0.71, n=7; fledged 5). In contrast, overall productivity on the Salt River was relatively low (0.67, n=15; fledged 10), where BAs on the regulated and unregulated Salt River (downstream vs. upstream of the Highway 288 bridge) had below-average productivity (0.77, n=13; fledged 10 vs. 0.0, n=2; fledged 0). While statewide productivity varies from year to year (Figure 3), it has been relatively high since 2004 and averaged 0.94 over the last ten years (Table 4). Statewide productivity was not based on a complete census as the Cibecue BA was not fully monitored.

The number of known bald eagle breeding areas in Arizona continues to grow. This increase has been consistent since the 1990s, but has been especially apparent in the last two decades, with an average of over three new BAs identified each year from 2006 to 2022. During that timeframe many of the new BAs (40%) were found at elevations above 6,000 ft, including the three confirmed this year (Eastern Star, Riggs, Tall Pine). The continued creation of new breeding areas, discovery of new nests, and changes in occupancy demonstrates the importance of ORA and survey flights as a means to consistently monitor bald eagle demography including population size, distribution, and reproductive success. The annual loss of alternate nests and the potential for further changes in distribution further demonstrates the necessity of the surveys. Without the aid of these flights, we would not be able to accurately document important population parameters in the rugged terrain of Arizona.

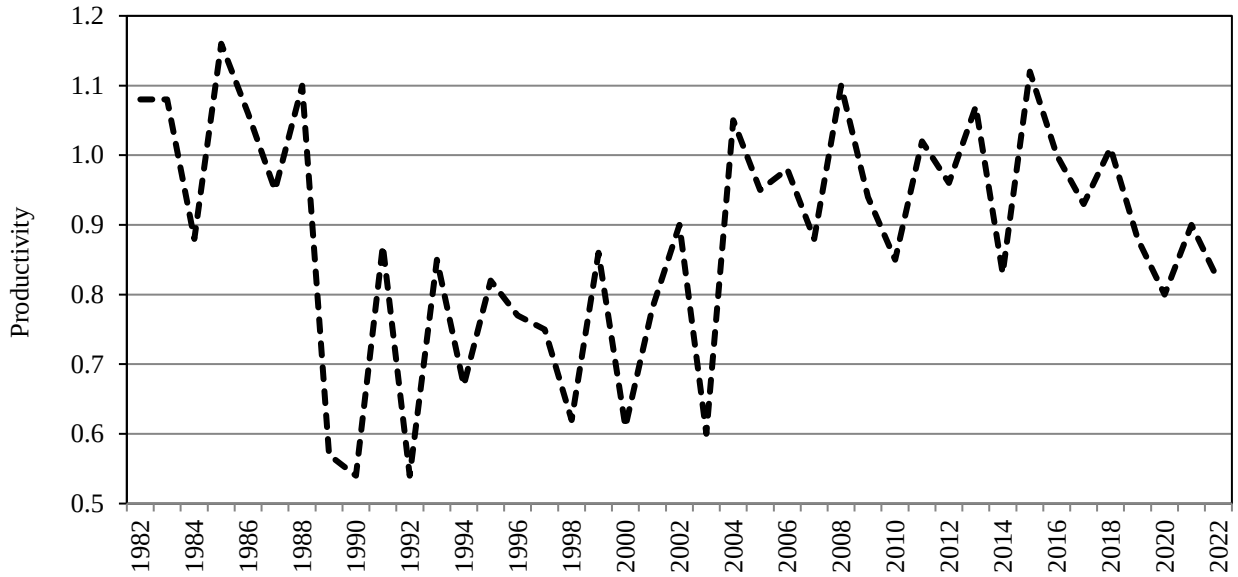


*Figure 3. Productivity at bald eagle breeding areas in Arizona, 1982-2022.*

Table 4. Arizona bald eagle ten-year productivity summary.

| | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of BAs | 95 | 93 | 92 | 89 | 87 | 85 | 81 | 76 | 68 | 68 |
| Number of occupied BAs | 75 | 77 | 73 | 74 | 69 | 68 | 65 | 59 | 52 | 54 |
| Occupancy rate (%) | 79 | 83 | 79 | 83 | 79 | 80 | 80 | 78 | 77 | 79 |
| Number of eggs (minimum) | 104 | 104 | 92 | 97 | 102 | 97 | 97 | 90 | 73 | 79 |
| Number of active BAs | 63 | 66 | 66 | 67 | 63 | 60 | 60 | 56 | 47 | 49 |
| Failed breeding attempts | 24 | 21 | 27 | 26 | 19 | 25 | 19 | 17 | 17 | 14 |
| Successful breeding attempts | 39 | 44 | 36 | 41 | 44 | 35 | 41 | 39 | 30 | 35 |
| Young hatched | 78 | 87 | 71 | 72 | 87 | 82 | 79 | 75 | 58 | 71 |
| Young fledged | 61[a] | 69[a] | 56[a] | 65 | 70 | 63 | 65 | 66 | 43 | 57 |
| Nest success | 0.53[a] | 0.58[a] | 0.51[a] | 0.55 | 0.64 | 0.51 | 0.63 | 0.66 | 0.58 | 0.65 |
| Mean brood size | 1.6[a] | 1.6[a] | 1.6[a] | 1.6 | 1.6 | 1.8 | 1.6 | 1.7 | 1.4 | 1.6 |
| Productivity | 0.82[a] | 0.91[a] | 0.80[a] | 0.88 | 1.01 | 0.93 | 1.0 | 1.12 | 0.83 | 1.06 |

[a]Some active sites were not included where success or failure was not determined.

Results of the individual survey flights are located in Appendix D. Areas worthy of further discussion (new nests, potential nest sites, historic BAs, new breeding areas, bald eagle observations, fallen nests) are described below. 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.

New Locations Surveyed (Table 5)
Included below are descriptions of new large nests found in suitable habitat (new nest sites), new breeding areas discovered, and results of surveys (including bald eagle sightings) outside of known breeding areas.

*Big Sandy River.* – On January 31, we surveyed cottonwood trees along the Big Sandy River for 1.5 miles upstream of its confluence with the Santa Maria River. No new nests or eagles were found.

*Black Canyon Lake.* – A new large nest (#1) was observed near the top of a live pine tree at Black Canyon Lake in Navajo County. The nest looked like it was probably an osprey construction however no eagles or ospreys were seen.

*Burro Creek.* – On March 17, we surveyed a strand of cottonwood trees along Burro Creek 5-6 miles upstream of the Burro Creek BA. No new nests or eagles were found.

*Carrizo Creek.* – On February 1, we found a medium to large size nest on a cliff along the creek. No eagles were seen.

*Cherry Creek.* – On April 18, we surveyed trees and small cliffs along Cherry Creek for 4.5 miles upstream of its confluence with the Salt River. No new nests or eagles were found.

*Eastern Star (new BA).* – On May 31, a pair of adult bald eagles and one nestling were found at a new large nest (#1) in a conifer tree. On June 23, one nestling approximately 10-weeks old was perched on a branch next to the nest (Figure 4). Due to the sensitivity of the nest location, the specific area is not named in this report.

*Ister Flat*. – On January 31, the USFS reported a sighting from the public of a pair of adult bald eagles perched above a large nest (#1) in a snag by the Verde River north of Horseshoe Reservoir. During an aerial survey on February 2, AGFD observed two adults perched by the new nest. No eagles were seen on surveys on March 17 and April 20. The area will be considered a potential nest site, not a breeding area, until or if bald eagles lay eggs. The new nest is within the territory historically associated with the eagles at the Horseshoe breeding area, however we observed an incubating adult in Horseshoe nest #13 on January 31, approximately three miles from the Ister Flat nest. We will continue to monitor the area for nesting activity.

*North Fork White River*. – On January 12, we surveyed the river as part of the annual bald eagle winter count and found four new nests in snags (North Fork 3 nest #1, North Fork 4 nest #1, and North Fork 5 nests #1 and #2). No eagles were seen in the area of any of the nests.

*Riggs (new BA).* – On April 20, we received a report and photograph from the public of an adult bald eagle incubating in a new large nest (#1) in a conifer snag in Graham County near Safford. A second adult was also perched by the nest. AGFD and USFS personnel visited the site at least two times through the end of April and incubation was confirmed (Figure 4). However, by early to mid May no eagles were seen and the nesting attempt had failed.

*Figure 4. Eastern Star (left) and Riggs (right) breeding areas. Photos by Kyle McCarty and Tim Snow.*

*Santa Fe Reservoir.* – On April 20, ospreys were found incubating in two new large nests (#1, #2) in snags.

*Tall Pine (new BA).* – On March 16, an adult bald eagle was incubating in nest #1 (Figure 5). This nest was discovered in 2021 and was named Mogollon #1 at the time, however the name was changed to Tall Pine #1 in 2022. Due to the sensitivity of the nest location, the specific area is not named in this report.

*Figure 5. Tall Pine breeding area (left) and potential nest site on the Verde River (right). Photos by Jennifer Presler and Nina Grimaldi.*

*Verde River (Camp Verde).* – On January 13, SRP reported a pair of adult bald eagles at a new, medium-sized nest in a live cottonwood tree adjacent to the Verde River north of Beasley Flat near Camp Verde. One of the adults was standing in the nest and the second adult, which had a blue band on its left leg consistent with an Arizona-hatched eagle, was perched in the nest tree (Figure 5). The nest was empty and no eagles were seen during surveys on January 31, March 17, and

April 20. Eagles have been sighted in this area in the past, and we will continue to monitor for any nesting activity.

Table 5. Arizona bald eagle nest survey summary, 2022 new locations.

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Big Sandy River | 1/31 | Helicopter | No nests or eagles. |
| Black Canyon Lake | 5/9 | Helicopter | New large nest #1 found. No eagles. |
| Boot Lake | 3/16 | Helicopter | No nests or eagles. |
| Burro Creek | 1/31 | Helicopter | No nests or eagles. |
| Carrizo Creek | 2/1 | Helicopter | Medium-large nest found on cliff. No eagles. |
| Cherry Creek | 4/18 | Helicopter | No nests or eagles. |
| Cooley Lake | 3/16 | Helicopter | No nests or eagles. |
| East Verde River | 1/7 | Helicopter | No nests or eagles. |
| Fossil Creek | 1/31 | Helicopter | No nests or eagles. |
| Goldwater Lake | 1/31 | Helicopter | No nests or eagles. |
| Ister Flat | 2/1, 3/17, 4/20 | Helicopter | 2/1: Pair of adults perched by new large nest #1 in snag. |
| North Fork White River | 1/12 | Helicopter | Four new large nests found. |
| Reservation Lake | 4/18 | Helicopter | No nests or eagles. |
| Santa Fe Reservoir | 4/20 | Helicopter | Ospreys incubating in two new large nests #1-2. |
| Tall Pine | 1/12, 2/1, 3/16, 4/18 | Helicopter | 3/16: Adult incubating in nest #1. |
| Verde River (Camp Verde) | 1/31, 3/17, 4/20 | Helicopter | One medium nest in a cottonwood tree. No eagles. |
| West Clear Creek | 1/7 | Helicopter | No nests or eagles. |

Potential Nest Sites (Table 6)
Below are findings at previously documented potential nest sites, including observations of bald eagles, new nests, fallen nests, and nesting activity of other raptor species.

*Bear Canyon Lake.* – On May 9, an osprey was incubating in nest #6, and nest #5 was partially fallen. No eagles were seen. Windy conditions limited the survey to one quick trip around the perimeter of the lake.

*JD Dam Lake.* – On April 20, nest #1 was fallen.

*Knoll Lake.* – On May 9, an osprey was incubating in nest #6 and nest #5 was not found. No eagles were seen.

*Sunflower Flat.* – On April 20, nest #1 was fallen.

*Willow Springs Lake.* – On May 9, ospreys were incubating in nests #4-5, 11-12 and either #2 or #9. Three new large nests (#13-15) were found in snags. Ospreys were incubating in nests #13-14, and #15 was empty. No eagles were seen.

| Table 6. Arizona bald eagle nest survey summary, 2022 potential nest sites. | | | |
|---|---|---|---|
| Location* | Date(s) | Survey Method | Results |
| Bear Canyon Lake | 5/9 | Helicopter | Osprey incubating in nest #6. Nest #5 partially fallen. No eagles. |
| Cibecue Crossing | 1/12, 3/16 | Helicopter | All known nests empty. No eagles. |
| Granite (2GE049) | 1/7, 1/31, 3/17 | Helicopter | All known nests empty. No eagles. |
| Hell Point (3GE017) | 1/7, 1/31 | Helicopter | All known nests empty. No eagles. |
| Hidden Valley | 1/31 | Helicopter | All known nests empty. No eagles. |
| JD Dam Lake | 4/20 | Helicopter | Nest #1 fallen. |
| Knoll Lake | 5/9 | Helicopter | Osprey incubating in nest #6. Nest #5 not found. No eagles. |
| Mormon Pocket (2GE031) | 1/7, 1/31, 4/20 | Helicopter | All known nests empty. No eagles. |
| Muldoon | 1/7, 1/31 | Helicopter | All known nests empty. No eagles. |
| North Fork 1 | 1/12 | Helicopter | All known nests empty. No eagles. |
| North Fork 2 | 1/12 | Helicopter | All known nests empty. No eagles. |
| Pineasco Creek | 3/16, 4/18 | Helicopter | All known nests empty. No eagles. |
| Sunflower Flat | 4/20 | Helicopter | Nest #1 fallen. No eagles. |
| Watson Lake (3GE010) | 3/17 | Helicopter | All known nests empty. No eagles. |
| Willow Springs Lake | 5/9 | Helicopter | Ospreys incubating in nest #4-5, 11-12, and either #2 or #9. Three new large nests found, with ospreys incubating in two of them. No eagles. |

*Parentheses indicates corresponding site identification number in the Department's golden eagle database.

Historic Breeding Areas (Table 7)
Below are findings at historic breeding areas including observations of bald eagles, new nests, fallen nests, and nesting activity of other species.

| Table 7. Arizona bald eagle nest survey summary, 2022 historic breeding areas. | | | |
|---|---|---|---|
| Location | Date(s) | Survey Method | Results |
| Bagley | 1/31, 3/15 | Helicopter | All known nests empty. No eagles. |
| Canyon | 1/10 | Helicopter | No new nests or eagles. |
| Needle Rock | 1/7, 1/31, 3/17 | Helicopter | No new nests or eagles. |
| Tower | 1/7, 1/31 | Helicopter | All known nests empty. No eagles. |
| Mule Hoof | 1/12, 2/1, 3/16 | Helicopter | All known nests empty. No eagles. |

Breeding Areas (Table 8)
Below are findings at known breeding areas, limited to observations of new nests, fallen nests, bald eagles without active nests, and breeding activity of other species.

*Ashurst.* – On March 17, two adult bald eagles were perched in the area of nest #3.

*Becker.* – On February 1, two adult bald eagles were seen in the area.

*Bill Williams.* – During a ground visit on February 15, no nests or eagles were observed. A wildfire in June 2021 burned most of the vegetation in the breeding area, and nest #4 was likely destroyed at that time. Due to the extensive damage there were few, if any, live trees remaining along the river within the breeding area (Figure 6) however there were still some live trees visible farther upstream. This was the tenth consecutive year that the Bill Williams BA has been unoccupied, and it will now be designated as a historic BA.

*Cedar Basin.* – On April 18, one adult bald eagle was soaring in the area. On February 1, a medium to large nest was found on a small cliff upstream on Carrizo Creek. However, it was unclear whether the nest was large enough to be considered an eagle nest.

*Cole's Bay*. – On January 7, one adult bald eagle was standing in nest #1. Nestwatchers observed two adults visiting the nest with some nest building and maintenance activities during February and early March, but no eggs were laid.

*Crescent.* – On January 12, an adult was sitting in nest #1 and appeared to be incubating (Figure 6). Prior to this year, incubation had never been observed at Crescent Lake during January surveys. Historically, incubation dates for the site ranged from late February to mid-March or later, so the observation on January 12 would be unusually early. If incubation occurred then the nesting attempt failed by February 1 when the nest was empty, and no eagles were seen during subsequent visits in March and April. Alternatively, the observation on January 12 could have been a false positive with an eagle sitting in the nest but not on eggs.

*Figure 6. Burned habitat at the Bill Williams BA (left) and adult bald eagle in the Crescent nest on January 12 (right). Photos by Kyle McCarty and Jennifer Presler.*

*Doka*. – On January 7, two adult bald eagles were perched at a new large nest (#9) in a snag. Nest #7 was fallen.

*George's Basin*. – On February 1 and March 16, one adult bald eagle was perched in the area.

*Gilbert.* – In 2012, a pair of bald eagles was observed incubating at a nest in a eucalyptus tree on private property within a neighborhood in the town of Gilbert. The nesting attempt failed during

incubation that year, and no eagles have been seen or reported since then. As a result, this was the tenth consecutive year that the Gilbert BA has been unoccupied, and it will now be designated as a historic BA.

*Granite Basin.* – On January 10, two adult bald eagles were standing in nest #2. On March 16, two adults were again seen, one of them perched above nest #2 and the other flying to the nest which was empty.

*Granite Reef.* – On January 10, nest #2 was fallen.

*Green River*. – On January 7, an adult bald eagle was incubating in a new nest (#2) in a cottonwood tree.

*Lone Pine.* – On January 12, nest #6 was fallen. On March 16, two adult bald eagles were seen in the area of a new large nest (#9) found on a cliff less than one mile downstream of nest #2.

*Luna.* – On April 12, Nestwatchers found that the nest tree (#1) had snapped in half during a violent windstorm, killing both nestlings. On August 30, AGFD and USFS installed a starter nest platform in a live pine tree within the breeding area.

*Lynx.* – On January 31, an adult bald eagle was incubating in nest #7. On February 22, we confirmed that the nest tree had fallen during a windstorm the previous day and one broken egg was found in the debris.

*Nevada Bay.* – On March 23, one adult flew off a cliff in the nest area, however all known nests were empty and no new nests were found.

*OW.* – U.S. Forest Service personnel conducted ground surveys of the breeding area regularly from January through April and observed a pair of adult bald eagles perching near and in the known nests, however no eggs were laid. Both adults were reported as having bands on both legs (silver band on the right leg and blue band on the left leg). On May 9, nest #3 was noted as fallen.

*Perkinsville*. – On January 31, one adult bald eagle was seen perched at nest #4 and on March 17 one adult was perched by the river.

*Redmond*. – On February 1, two adult bald eagles were perched close together near nest #5. Both adults were unbanded.

*Sheep Creek*. – On January 31, one adult bald eagle was perched by nest #1.

*Sullivan Lake*. – On January 7, an adult bald eagle was incubating in a new nest (#4) in a snag. Nest #3 was fallen.

*Sycamore*. – On January 7, nest #6 was not found but one immature and two adult bald eagles were seen in the area. We observed evidence of the wildfire that had burned some of the area around

Sycamore Creek in May 2021, including many dead trees suggesting that nest #6 was destroyed in the fire. On January 31, two adults were perched in nest tree #7 and nestwatchers observed a pair of adults bringing nest materials to this nest throughout February, but no eggs were laid.

*Tapco.* – On January 31, one adult was seen flying upstream. All known nests were empty.

*Tonto.* – On January 10, nest #9 was fallen. One adult bald eagle was seen near nest #6 and a second adult was seen 1.5 miles upstream on January 10. A single adult was seen on March 15.

*White Horse.* – On April 20, an osprey was incubating in nest #8 and a new large nest #9 was found in a snag. One osprey was standing in nest #6. No eagles were seen.

Table 8. Arizona bald eagle nest survey summary, 2022 breeding areas.

| Location | Date(s) | Method | Results |
|---|---|---|---|
| Ashurst | 3/17, 4/20 | Helicopter | 3/17: Pair of adults perched in area. |
| Becker | 2/1, 3/16 | Helicopter | 2/1: Two adults in area. |
| Bill Williams | 2/15 | Ground | Nest #4 fallen. No new nests or eagles. |
| Cedar Basin | 1/12, 2/1, 3/16, 4/18 | Helicopter | 4/18: One adult soaring in area. |
| Cole's Bay | 1/7, 1/31, 3/17 | Helicopter | 1/7: One adult at nest #1. No eggs or young. |
| Crescent | 1/12, 2/1, 3/16, 4/18 | Helicopter | 1/12: One adult sitting in nest #1. |
| Doka | 1/7, 1/31, 3/17, 4/20, 5/9 | Helicopter | 1/7: Two adults at new large nest #9. Nest #7 fallen. |
| George's Basin | 1/12, 2/1, 3/16 | Helicopter | 2/1 & 3/16: One adult perched in area. |
| Gilbert | -- | -- | No nests or eagles reported. |
| Granite Basin | 1/10, 2/1, 3/16 | Helicopter | 1/10: Pair of adults in nest #2. 3/16: Two adults in area. |
| Granite Reef | 1/10, 1/31, 3/15 | Helicopter | 1/10: Nest #2 fallen. |
| Green River | 1/7, 1/31, 3/17 | Helicopter | 1/7: Adult incubating in new nest #2. Nest #1 fallen. |
| Lone Pine | 1/12, 2/1, 3/16, 4/18 | Helicopter | 1/12: Nest #6 fallen. |
| Luna | 4/12 | Nestwatch | 4/12: Nest #1 fallen in windstorm, nestlings killed. |
| Lynx | 1/7, 1/31, 2/22, 3/17 | Helicopter, Ground | 2/22: Nest #7 fallen. |
| Nevada Bay | 2/24, 3/23 | Helicopter | 3/23: One adult in area. All known nests empty and no new nests. |
| OW | 5/9 | Helicopter | Nest #3 fallen. No eagles. |
| Perkinsville | 1/7, 1/31, 3/17, 4/20 | Helicopter | 1/31: One adult perched at nest #4. 3/17: One adult perched by river. |
| Redmond | 1/10, 2/1, 3/15, 4/18 | Helicopter | 2/1: Pair of adults perched. |
| Sheep Creek | 1/7, 1/31, 3/17, 4/20 | Helicopter | 1/31: One adult perched by nest #1. |
| Sullivan Lake | 1/7, 1/31, 3/17, 4/20 | Helicopter | 1/7: Adult incubating in new nest #4. |
| Sycamore | 1/7, 1/31, 3/17 | Helicopter | 1/7: Nest #6 not found. Two adults and one immature in area. 1/31: Pair of adults perched in nest tree #7. |
| Tapco | 1/7, 1/31, 3/17 | Helicopter | 1/31: One adult flying upstream. |
| Tonto | 1/10, 2/1, 3/16 | Helicopter | 1/10: Nest #9 fallen. Two adults seen. 3/16: One adult in area. |
| White Horse Lake | 3/17, 4/20 | Helicopter | New large nest #9 found. Osprey incubating in nest #8. Osprey standing in nest #6. No eagles. |

Breeding Areas in Surrounding States (Table 9)

*Black Canyon BA (Nevada).* – On February 24, an adult bald eagle was incubating in nest #1 and on March 23 an adult was brooding or shading at least one nestling approximately 2 weeks old.

*Copper Basin BA* (*California*). – Personnel from the Metropolitan Water District of Southern California reported observations of a pair of bald eagles in the area but nesting was not confirmed.

Table 9. Bald eagle breeding area observations in surrounding states, 2022.

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Black Canyon, NV | 2/24, 3/23 | Helicopter | 2/24: Adult incubating in nest #1. 3/23: Adult with at least one nestling, 2 weeks old. |
| Copper Basin, CA | -- | -- | Pair of adults reported in area. |

MANAGEMENT RECOMMENDATIONS

1. Future survey efforts should continue to monitor historic BAs, potential breeding habitat, large nests, and sightings of adult eagles reported in previous nest survey reports. These documents are useful tools for identifying occupancy trends, locating new BAs, and monitoring population expansion.
2. Surveyors should continue to use the nest survey, ORA, and winter count flights, in concert with follow-up ground surveys to inspect areas. From the air, surveyors can easily cover large sections of bald eagle habitat. From the ground, surveyors can investigate areas in more detail.
3. Confirm the band status and identify blue-banded adults observed at new and recently discovered breeding areas including Black Cross, Cataract (2021), Eagle Mountain, Green River, Kachina, Kaibab Lake, OW, Nevada Bay, Rainbow, Two Bar, Water Nest.
4. Identify banded adults at sites where one or both of the pair has long tenure within the breeding area in order to detect when replacement of these important birds has occurred.
5. Examine the following areas for breeding bald eagles and/or nests:
    - Anderson Mesa and area lakes –Kinnikinick Lake.
    - Big Sandy River drainage – upper Trout Creek.
    - Black River drainage – Known osprey nesting areas on the East and West Fork and main stem of the Black River; Tanks Canyon.
    - Central and Eastern Mountain Lakes – Bear Canyon, Black Canyon, Blue Ridge, Dry, Knoll, Lyman, Nash Creek, Point of Pines, Rogers, Willow Springs.
    - Colorado River drainage – Gene Wash Reservoir (CA), Cibola Havasu National Wildlife Refuge, Havasu National Wildlife Refuge, Imperial National Wildlife Refuge, Black Canyon (Lake Mohave to Lake Mead), Lake Mead (Grand Wash), Nankoweap Creek.
    - North Fork of White River – Known osprey nesting locations.
    - Prescott area – Watson, Willow, and Goldwater lakes.
    - Gila River drainage – Lower Blue River, San Francisco River, Gila Box, Gila River bottom through Phoenix metro area.
    - Salt River Drainage – Search at least two miles upstream on major washes and creeks around Roosevelt Lake (e.g., Greenback Creek, Pinto Creek); Tonto Creek north of Tonto

BA; Redmond BA to Lone Pine BA; major side drainages above Highway 60 bridge (e.g., Sawmill Canyon, Carrizo Creek).
- Verde River drainage – Wet Bottom Creek, Red Creek, Canyon Creek, Houston Creek, Fossil Creek, Camp Verde to Cottonwood, West Clear Creek, Beaver Creek, Oak Creek.
- White Mountain Lakes – Big Lake, Carnero, Christmas Tree, Nelson, Nutrioso, Pacheta.
- White River – Whiteriver to confluence with Black and Salt Rivers.
- Williams area lakes – JD Dam and Santa Fe Reservoir.
- Urban and rural areas – Payson, Stanfield.

## ARIZONA BALD EAGLE NESTWATCH PROGRAM

### INTRODUCTION

In 1978, the USFS and two Maricopa Audubon Society volunteers monitored bald eagles breeding near Bartlett Reservoir to understand the effects of recreation on nesting behavior and success (Forbis et al. 1985). This monitoring effort eventually expanded to other BAs, and developed into the Arizona Bald Eagle Nestwatch Program (ABENWP). In 1986, the USFWS assumed coordination of the ABENWP on behalf of the SWBEMC, and expanded its scope. Following passage of the Heritage Initiative in 1990, a voter initiative which created a fund from Arizona Lottery proceeds for conservation of wildlife and natural areas, the Department was able to develop and support a comprehensive bald eagle management program. In 1991, the USFWS transferred coordination of the ABENWP to the Department.

To address the continuing management needs for Arizona's breeding bald eagles, the ABENWP operates under three goals: education, data collection, and conservation. Due to high recreation pressures along some of Arizona's lakes and rivers, land management agencies enact seasonal closures when necessary to protect bald eagles during the breeding cycle. Nestwatchers interact with members of the public who enter these closures, educate them about bald eagles, distribute brochures, and/or direct them away from the breeding attempt. To help the land and wildlife agencies make better bald eagle management decisions, nestwatchers collect basic biological information and behavioral responses to human activities. One of the most tangible benefits of the ABENWP is determining when bald eagles are in life-threatening situations, allowing Department biologists to intervene in these situations and either eliminate or reduce the threat, or rescue injured eagles. In this report, we summarize noteworthy discoveries at each BA monitored by the ABENWP in 2021. Detailed reports of each monitored BA are centralized at the Department, and are distributed to the appropriate land and wildlife management agencies.

### METHODS

We selected BAs to be monitored by weighing the level of recreation activity and management needs. Included are those with seasonal closures (Bachelor Cove, Box Bar, Cole's Bay, Concho, Goldfield, Luna, Pleasant, Whiskey Spring, and Woods Canyon), those without closures (Cataract, Fort McDowell, Granite Reef, Greer Lakes, Orme, Rodeo, Scholz Lake, and Sycamore), and those monitored opportunistically for information (Doka and Tonto). In the fall of 2021, we advertised

the ABENWP contract positions through newsletters, web pages, and at university and college job placement services nationwide. Presentations, brochures, and word-of-mouth also contributed to this year's pool of applicants.

We held two orientation meetings, and three question and answer sessions for the selected ABENWP contractors (nestwatchers). The two orientation meetings offered an introduction to the program, background information on the ABENWP's role in bald eagle management, and an explanation of data forms and emergency protocols. After the orientation meetings, nestwatchers chose a partner, a BA, and were taken into the field. The question and answer sessions occurred after the first 10-day work period and subsequently after every second 10-day work period. In these sessions, we discussed filling out data forms, consistency in data collection, requirements for the final report, and any additional concerns or comments. When appropriate, additional problems or questions were handled on an individual basis. Additional communication was achieved via phone and email.

Fieldwork began February 4 and continued until nestlings fledged. If a nesting attempt failed, nestwatchers were moved to alternate sites for the remainder of the season. Teams of two nestwatchers maintained a ten-days-on/four-days-off schedule. During each work period, weekend observations were conducted from dawn-to-dusk to cover times of high recreation use and to document the resulting habitat use of the breeding pair. Monday through Thursday observations were a minimum of eight hours with emphasis on identifying territory boundaries, home range, and overall habitat use of the breeding pair.

Nestwatchers recorded bald eagle behavior and human activity data from assigned observation points (OP) within the BA. We selected each OP to provide optimal viewing while minimizing the impact to the breeding bald eagles. Alternate OPs were identified when the breeding pair utilized areas out of view of the primary OP. Nestwatchers were provided with spotting scopes, Motorola® radios, and/or USFS radios for viewing and communication needs. We supplied standardized data forms, BA maps with river and/or lake kilometer (rk/lk) designations, and other reference materials. Nestwatchers provided their own transportation, gas, field supplies, binoculars, and housing on days off.

Within an arbitrary 1.0 km (3,281 ft) radius of a bald eagle or active nest, nestwatchers recorded all human activity and the associated bald eagle behavior. Aircraft flying below the 2,000-foot FAA advisory over bald eagle breeding areas were also recorded. Nestwatchers classified bald eagle behavior in response to human activity into seven categories: none, watched, restless, flushed, left area, bird not in area, and unknown. If the bald eagles performed their normal activities without acknowledging the human activity, nestwatchers recorded a "none" response. "Watched" was a bald eagle looking in the direction of the human activity without displaying any other observable reaction. If the bald eagle vocalized and/or moved noticeably without leaving the nest or perch, nestwatchers recorded "restless." If a bald eagle left its location quickly in response to a human activity, nestwatchers recorded a "flushed" response. "Left area" was recorded when a bald eagle became intolerant and flew far away. Nestwatchers recorded "bird not in area" if a bald eagle was not present, and "unknown" if a bald eagle was present but its response could not be observed. Activities that caused a change in bald eagle behavior, provoking a response of "restless," "flushed," and "left area" were considered significant.

At the Bachelor Cove, Box Bar, Cataract, Concho, and Woods Canyon BAs the nestwatchers recorded human activity differently than described above. At the Bachelor Cove BA, nestwatchers had a limited view of the area with observations primarily restricted to the nest canyon and immediate area. Traffic along Highway 188 was not recorded due to its regular presence and no reaction from the resident eagles. At the Box Bar BA, nestwatchers had a limited view of the area to the north, east, and south of the nest tree and no view to the west, and therefore were only able to observe human activity occurring within about 250 m of the nest tree. At Cataract, nestwatchers only recorded activities at, on, or over the lake and within ~300 m of the nest tree, excluding the everyday activities at homes and along the nearby highway. At Concho, because Highway 61, residences, and other permanent structures occur within 1 km of the nest tree, nestwatchers limited their recording of human activity to the lake area east of the highway. At the Woods Canyon BA, due to a high volume of recreationists at the lake, nestwatchers only recorded eagle responses to activities within about 200 m of the nest or an eagle, as well as visitors to the observation point and any activity that elicited a significant response from an eagle.

In addition to recording human activity and associated eagle responses, nestwatchers documented bald eagle behavior at their BA including: interactions with other wildlife, habitat use, forage events, type of prey species delivered and frequency of deliveries to the nest, incubation time, time attending the nest, and feeding frequency. In this report, we only describe human activity, foraging attempts, prey deliveries, habitat use, and site-specific management recommendations.

## RESULTS AND DISCUSSION

The ABENWP monitored 19 breeding areas (either full or part-time) in 2022 including Bachelor Cove, Box Bar, Cataract, Cole's Bay, Concho, Doka, Fort McDowell, Goldfield, Granite Reef, Greer Lakes, Luna, Orme, Pleasant, Rodeo, Scholz Lake, Sycamore, Tonto, Whiskey Spring, and Woods Canyon (Appendix C). The Cole's Bay, Doka, Fort McDowell, Granite Reef, Tonto, and Whiskey Spring BAs were either monitored part-time or opportunistically by nestwatchers at nearby BAs. Therefore, data for some of these sites are not included in the following section of this report.

### Bachelor Cove Breeding Area (Appendix E, Figure 7)

*Observation Period.* – February 4 to May 1. Total monitoring 524.3 hours over 63 days.

*Bald Eagle Identification.* – Both eagles were in adult plumage. The female was not banded (unknown origin), and the male had a blue VID band "21/W" on the left leg and silver band on the right leg (2008 nestling from the Pleasant BA).

*Management Activities.* – 1) The USFS maintained "No Entry" signs around the nest area.

*Human Activity.* – Nestwatchers recorded 551 human activities. Terrestrial activity of eleven types represented 82.2% of activities, aircraft activity (small plane, helicopter, jet) 17.2%, and watercraft (boat) 0.5%. Four types of activity elicited eight significant responses from the breeding pair. The bald eagles were restless in response to three hikers, and left the area in response to two vehicles, one OHV, one hiker, and one nestwatcher.

*Food Habits*. – The nestwatchers observed 15 forage events, with fish accounting for 53.3%, birds 26.7%, and mammals 20.0%. The male was successful in 50.0% (n=6), the female in 57.1% (n=7), and an unknown adult in 100% (n=2) of forage events. The breeding pair was observed delivering 77 prey items to the nest, of which the male delivered 46.8%, the female 44.2%, and an unknown adult 9.1%. Fish comprised 45.5%, mammals 6.5%, birds 3.9%, and unknown prey 44.2% of the deliveries. Of the 6 prey items further identified, 16.7% (n=1) each were catfish species, sucker species, waterfowl species, rabbit species, and desert cottontail (*Sylvilagus audubonii*).

*Habitat Use.* – The Bachelor Cove nestwatchers identified 14 separate perch locations spanning 1.5 km of Roosevelt Lake, ranging from lk 82.2 to 83.7. The bald eagle pair spent 46.0% of the observed time at lake km (lk) 82.6, 29.4% at lk 82.2, 11.7% at lk 82.1, 3.6% at lk 82.3, 3.0% at lk 82.4, and 6.3% at the remaining locations.

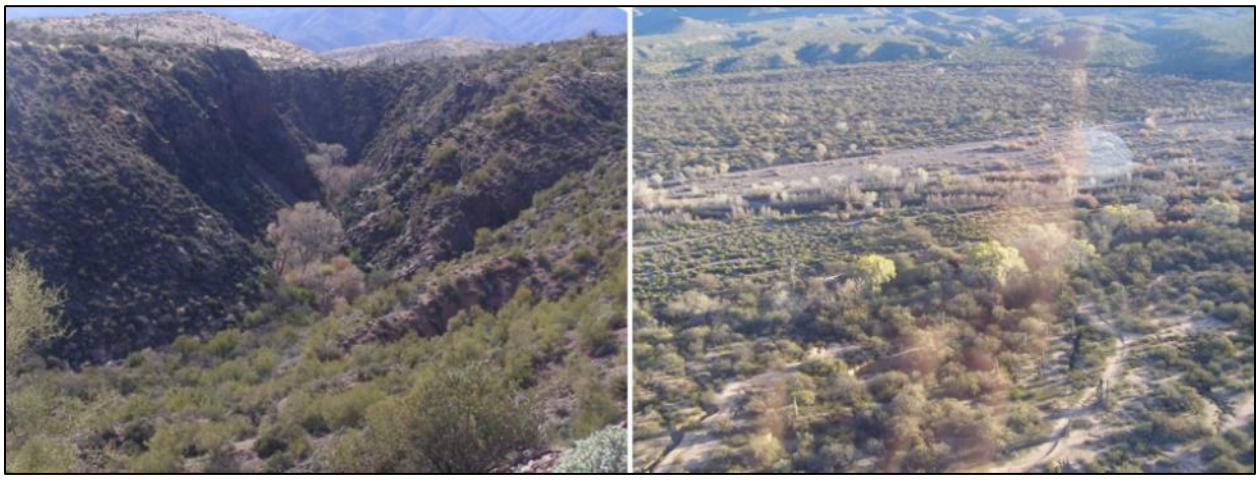

*Figure 7. Bachelor Cove (left) and Box Bar (right) breeding areas. Gila and Maricopa Counties, Arizona.*

Box Bar Breeding Area (Appendix F, Figure 7)
*Observation Period.* – February 4 to April 5. Total monitoring 386 hours over 45 days.

*Bald Eagle Identification.* –The male was in adult plumage and not banded (unknown origin), and the female was in near-adult to adult plumage and was not banded.

*Management Activities.* – 1) The USFS enacted a closure around the nest area and placed or maintained "No Entry" signs.

*Human Activity.* – Nestwatchers recorded 574 human activities. Terrestrial activity of 9 types represented 86.1% and water pursuits (canoe/kayak, swimmer, tuber, paddle board) 13.9% of activities. None of the activities elicited significant responses from the breeding pair.

*Food Habits*. – The nestwatchers were unable to observe any forage events. The breeding pair was observed delivering 18 prey items to the nest, of which the male delivered 100%. Fish comprised 72.2%, mammals 11.1%, and unknown prey 16.7% of the deliveries. Of the 5 prey items further identified, 60.0% were tilapia species, 20.0% were desert cottontails, and 20.0% were ground

squirrel species.

*Habitat Use.* – The Box Bar nestwatchers identified five separate perch locations spanning 1.4 km of the Verde River ranging from river kilometer (rk) 24.4 to 25.8. The bald eagles spent 65.0% of the observed time at rk 25.5, 25.6% at rk 25.8, 8.1% at rk 25.4, and 1.3% at the remaining locations.

Cataract Breeding Area (Appendix G, Figure 8)
*Observation Period.* – March 18 to May 31. Total monitoring 570.5 hours over 58 days.

*Bald Eagle Identification.* – Both eagles were in adult plumage. The male had a blue VID band "28/K" on his left leg and USFWS band on the right leg (2012 Lower Lake Mary nestling). The female was unbanded (unknown origin).

*Management Activities.* – 1) The USFS established advisory signs directing recreation away from the nest area. 2) On April 8, one female and one male nestling were banded with blue VID bands "75B" and "76B" at 5-5.5 weeks old.

*Human Activity.* – Nestwatchers recorded 140 human activities. Terrestrial activity of eight types represented 86.4% of activities, watercraft (canoe, boat) 11.4%, and aircraft (plane, helicopter) 2.1%. Four types of activity elicited ten significant responses from the breeding pair. The bald eagles were restless in response to three observers and one helicopter, flushed in response to three hikers, and one observer, and left the area in response to two biologists.

*Food Habits*. – The nestwatchers observed 48 forage events, with fish accounting for 100%. The male was successful in 65.5% (n=29), the female in 50.0% (n=18), and tandem adults in 100% (n=1) of forage events. The breeding pair was observed delivering 63 prey items to the nest, of which the male delivered 73.0%, the female 25.4%, and an unknown adult 1.6%. Fish comprised 69.8%, birds 4.8%, and unknown prey 25.4% of the deliveries. Of the 24 prey items further identified, 54.2% were rainbow trout (*Oncorhynchus mykiss*), 33.3% were channel catfish (*Ictalurus punctatus*), 8.3% were trout species, and 4.2% were tiger trout.

*Habitat Use.* – The Cataract nestwatchers identified five separate perch locations. The bald eagle pair spent 96.6% of the observed time at lake kilometer (lk) 2.00 and 3.4% at the remaining locations.

*Figure 8. Cataract (left) and Concho (right) breeding areas. Coconino County and Apache County, Arizona.*

Concho Breeding Area (Appendix H, Figure 8)
*Observation Period.* – February 4 to June 9. Total monitoring 895 hours over 90 days.

*Bald Eagle Identification.* – Both resident eagles were in adult plumage and unbanded (unknown origins).

*Management Activities.* – 1) "No Entry" signs were placed or maintained around the perimeter of the nest area. 2) On April 25, two male nestlings were banded with blue VID bands "79B" and "80B" at 6 weeks old.

*Human Activity.* – Nestwatchers recorded 147 human activities. Terrestrial activity of 11 types represented 89.8%, aircraft activity (airplanes, helicopters) 9.5%, and watercraft (boat) 0.7%. Five types of activities elicited five significant responses from the breeding pair. The bald eagles flushed in response to one ATV, one birdwatcher, one horseback rider, one rancher, and one helicopter.

*Food Habits*. – The nestwatchers observed 51 forage events, with birds accounting for 58.8%, fish 17.6%, mammals 7.8%, and unknown prey types 15.7%. The male was successful in 45.0% (n=40) and the female 72.7% (n=11) of forage events. The breeding pair was observed delivering 33 prey items to the nest, of which the male delivered 54.5% and the female 45.5%. Birds comprised 33.3%, fish 24.2%, mammals 15.2%, and unknown prey types 27.3% of the deliveries. Of the 17 prey items further identified, 64.7% were American coots (*Fulica americana*), 23.5% were prairie dogs, 5.9% were common carp (*Cyprinus carpio*), and 5.9% were catfish species.

*Habitat Use.* – The Concho nestwatchers identified 35 separate perch locations at the lake. The bald eagle pair spent 52.6% of the observed time at lk 1.4, 33.0% at lk 1.5, 4.4% at lk 1.1, and 10.0% at the remaining locations.

Goldfield Breeding Area (Appendix I, Figure 9)
*Observation Period*. – February 4 to April 29. Total monitoring 420 hours over 65 days.

*Bald Eagle Identification.* – Both resident eagles were in adult plumage. Nestwatchers reported the male had a blue VID band on the left leg, and a USFWS band on the right leg (unknown origin, but blue band consistent with Arizona origin), and the female was unbanded.

*Management Activities.* – 1) The USFS enacted the seasonal BA closure and maintained wildlife breeding area signs along the river prohibiting entry. 2) The USFS closed off vehicle access to the nest area.

*Human Activity.* – Nestwatchers recorded 15,139 human activities during the observation period. Water activities of 20 types represented 50.3%, terrestrial activities of 8 types 37.4%, and aircraft of five types 12.3%. Three types of activity elicited four significant responses from the breeding pair. The bald eagles were restless in response to one helicopter and flushed in response to one nestwatcher and two paddleboards.

*Food Habits*. – The nestwatchers observed five forage events, with birds accounting for 20.0%, fish 20.0%, and unknown prey types 60.0%. The male was successful in 100% (n=1), and the female 0% (n=1), and an unknown adult in 66.6% (n=3) of forage events. The breeding pair was observed delivering 82 prey items to the nest, of which the male delivered 30.5%, the female 43.9%, and unknown adult 25.6%. Fish comprised 23.2%, birds 8.5%, mammals 1.2%, and unknown prey types 67.1% of the deliveries.

*Habitat Use.* – The Goldfield nestwatchers identified 28 perch locations, spanning a 2.5 km stretch of the Salt River ranging from rk 8.8 to 11.3. The bald eagle pair spent 19.3% of the observed time at rk 9.9, 18.7% at rk 8.8, 11.8% at rk 10.3, 9.5% at rk 10.1, 9.5% at rk 9.8. 9.2% at rk 9.4, 7.1% at rk 10.5, 5.5% at rk 9.3, 3.8% at rk 10.7, 3.1 % at rk 9.1, and 2.5% at the remaining locations.

*Figure 9. Goldfield (left) and Greer Lakes (right) breeding areas. Maricopa County and Apache County, Arizona.*

Greer Lakes Breeding Area (Appendix J, Figure 9)
*Observation Period*. – April 29 to June 23. Total monitoring 415 hours over 43 days.

*Bald Eagle Identification.* – Both eagles were in adult plumage. The male had a blue VID band on his left leg, USFWS band on the right leg (unknown origin, but blue band consistent with Arizona origin), and the female was unbanded (unknown origin).

*Management Activities.* – 1) On May 12, two male nestlings were banded with blue VID bands "83B" and "84B" at 6 weeks old.

*Human Activity.* – Nestwatchers recorded 42 human activities during the observation period. Terrestrial activities of five types represented 100% of activities. Two types of activity elicited four significant responses from the breeding pair. The bald eagles were flushed in response to one helicopter and left the area in response to three photographers.

*Food Habits*. – The nestwatchers observed 40 forage events, with fish accounting for 95.0%, and birds for 5.0%. The male was successful in 100% (n=22) and the female 100% (n=18) of forage events. The breeding pair was observed delivering 39 prey items to the nest, of which the male delivered 56.4% and the female 43.6%. Fish comprised 94.9% and birds 5.1% of these deliveries.

*Habitat Use.* – The Greer Lakes nestwatchers identified 13 perch locations around Greer Lakes. The bald eagle pair spent 71.9% of the observed time at lk 1.4, 9.3% at lk 1.1, 4.2% at lk 1.9, 3.7% at lk 2.7, 2.7% at lk 1.7, 2.5% at lk 1.8, and 5.7% at the remaining locations.

Luna Breeding Area (Appendix K, Figure 10)
*Observation Period*. – February 4 to April 10. Total monitoring 476 hours over 50 days.

*Bald Eagle Identification.* – Nestwatchers reported that both resident eagles were in adult plumage and unbanded.

*Management Activities*. – 1) Due to the catastrophic loss of nest #1 and the nestlings in a violent windstorm on April 12, AGFD installed a starter nest platform in a live pine tree within the breeding area on August 30.

*Human Activity.* – The nestwatchers recorded 285 human activities. Terrestrial activity of eight different types accounted for 91.6% and water pursuits (fishing boats, float tubers, kayaks/canoes) 8.4%. None of the activities elicited a significant response from the breeding pair.

*Food Habits*. – The nestwatchers observed 58 forage events, with birds accounting for 65.5%, fish 31.0%, and carrion for 3.4%. The male was successful in 100% (n=34) and the female in 100% (n=24) of forage events. The breeding pair was observed delivering 55 prey items to the nest, of which the male delivered 61.8% and the female 38.2%. Birds comprised 67.3% of these deliveries and fish 32.7%. Of the 55 prey items further identified, 67.3% were American coots, 30.9% were rainbow trout, and 1.8% were cutthroat trout (*Oncorhynchus clarkii*).

*Habitat Use*. – Nestwatchers identified 16 separate habitat use areas around Luna Lake. The bald eagle pair spent 74.0% of the observed time at lk 2.4, 10.0% at lk 2.3, 4.5% at lk 2.2, 4.5% at lk 2.7, 3.7% at lk 0.7, and 3.4% at the remaining locations.

*Figure 10. Luna (left) and Orme (right) breeding areas. Apache and Maricopa Counties, Arizona.*

Orme Breeding Area (Appendix L, Figure 10)
*Observation Period*. – February 4 to May 22. Total monitoring 494 hours over 80 days.

*Bald Eagle Identification* – Both eagles were in adult plumage. The male had a blue VID band "26/B" on the left leg and USFWS band on the right leg (2011 nestling from the Riverside BA). The female was unbanded (unknown origin).

*Management Activities*. – 1) The Salt River Pima-Maricopa Indian Community (SRPMIC) continues to restrict non-tribal member use to the area. 2) On April 4, one female and one male nestling were blue VID banded "71/B" and "72/B" at 5.5-6 weeks old.

*Human Activity*. – Nestwatchers recorded 344 human activities. Aircraft (helicopters, small planes) represented 81.1% and terrestrial activities 18.9%. Three types of activity elicited 14 significant responses from the breeding pair. The bald eagles were restless in response to one helicopter and flushed in response to 11 horseback riders, one helicopter, and two AGFD biologists.

*Food Habits*. – The nestwatchers observed four forage events, with fish accounting for 50.0%, mammals 25.0%, and unknown prey types 25.0%. The female was successful in 50.0% (n=4) of forage events. The breeding pair was observed delivering 53 prey items to the nest, of which the male delivered 60.4%, the female 35.8%, both adults 1.9%, and an unknown adult 1.9%. Fish comprised 35.8%, birds 34.0%, mammals 11.3%, and carrion 18.9% of the deliveries. None of the prey items were identified to species.

*Habitat Use*. – The Orme nestwatchers identified 13 perch locations spanning 0.6 km along the Verde River ranging from rk 0.2 to 0.8. The bald eagle pair spent 73.8% of the observed time at rk 0.6, 12.2% at rk 0.7, 5.1% at rk 0.8, 2.9% at rk 0.4, 2.0% at rk 0.1, and 4.0% at the remaining locations.

Pleasant Breeding Area (Appendix M, Figure 11)
*Observation Period*. – February 5 to March 7. Total monitoring 121 hours over 20 days.

*Bald Eagle Identification.* – The male and female were both unbanded and in adult plumage (unknown origin).

*Management Activities.* – 1) MCPRD enacted the seasonal closure for the breeding area and marked closure boundaries with buoys. 2) Nestwatchers were supplied a boat by AGFD and educated recreationists about the closure and bald eagles.

*Human Activity.* – Nestwatchers recorded 29 human activities. Aircraft (planes, jets, helicopters) represented 62.1% and watercraft (boats) 37.9%. One type of activity elicited one significant response from the breeding pair. The bald eagles were restless in response to a military jet.

*Food Habits.* – No forage events were observed. The breeding pair was observed delivering four prey items to the nest, of which the male delivered 25.0% and the female 75.0%. Fish comprised 100% of these deliveries. None of the prey items were further identified.

*Habitat Use.* – The Pleasant nestwatchers identified 7 separate perch locations along the Agua Fria River arm of Lake Pleasant. Perches spanned a total of 2.5 km ranging from rk 73.1 to 75.6. The breeding pair spent 67.7% of the observed time at rk 73.5, 17.2% at rk 73.4, 14.9% at rk 73.3, and 0.3% at the remaining locations.

*Figure 11. Pleasant (left) and Rodeo (right) breeding areas. Maricopa County, Arizona.*

Rodeo Breeding Area (Appendix N, Figure 11)
*Observation Period.* – Part-time observations from February 4 to 20. Full-time observations from February 20 to May 22. Total monitoring 517.5 hours over 78 days.

*Bald Eagle Identification.* – The male and female were unbanded (unknown origin).

*Management Activities.* – 1) The FMYN restricts non-tribal member use of the river area. 2) On March 21, one male and one female nestling were banded with blue VID bands “66B” and “67B” at 5 weeks old. 3) On May 4, Nestwatchers, AGFD, and personnel from FMYN recovered both of the 11-week-old nestlings (pre-fledged) from the ground below the nest and were able to return one to the nest tree and took the other nestling (male) to Liberty Wildlife to treat dehydration. 4) On May

11, AGFD attached a satellite transmitter to the male nestling in rehab, and on May 13 it was released back into the nest tree. 5) On May 19, the male nestling was found dead and was recovered by AGFD.

*Human Activity*. – Nestwatchers recorded 30 human activities. Aircraft (helicopters, small planes, drones) accounted for 70.0% and terrestrial activities (nestwatcher, biologist, gunshot) for 30.0%. Four types of activities elicited six significant responses from the breeding pair. The eagles were restless in response to three biologists and one nestwatcher, flushed in response to one helicopter, and left the area in response to one small plane.

*Food Habits*. – Nestwatchers observed one forage event, with the male successful in one forage of a fish. The breeding pair was observed delivering 37 prey items to the nest, of which the male delivered 51.4% and the female 48.6%. Fish comprised 27.0%, birds 16.2%, and unknown prey types 56.8% of the deliveries. None of the prey items were further identified.

*Habitat Use*. – The Rodeo nestwatchers identified 7 separate perch locations spanning 3.9 km along the Verde River, ranging from river kilometer (rk) 3.1 to 7.0. The bald eagle pair spent 65.1% of the observed time at rk 3.1, 33.0% at rk 3.6, and 1.9% at rk 7.0.

Scholz Lake Breeding Area (Appendix O, Figure 12)
*Observation Period.* – May 27 to June 17. Total monitoring 151.5 hours over 18 days.

*Bald Eagle Identification.* – The male and female were unbanded and in adult plumage (unknown origin).

*Management Activities.* – 1) Nestwatchers educated recreationists about bald eagles. 2) On June 17, nestwatchers found one netling dead underneath. The carcass was recovered by AGFD and submitted for examination. Results were negative for HPAI.

*Human Activity*. – Nestwatchers recorded 234 human activities. Terrestrial activities of seven types accounted for 89.7% and water pursuits (swimmer, canoe/kayak, stand-up paddleboard) for 10.3%. Three types of activity elicited six significant responses from the breeding pair. The eagles flushed in response to four hikers, one canoe or kayak, and one paddleboard.

*Food Habits*. – Nestwatchers observed 32 forage events, with fish accounting for 93.8% and unknown prey types 6.3% The male was successful in 100% (n=8) and the female in 87.5% (n=24) of forage events. The breeding pair was observed delivering 37 prey items to the nest, of which the male delivered 27.0% and the female 73.0%. Fish comprised 83.8% and unknown prey types 16.2% of the deliveries. Of the 17 prey items further identified, all were catfish species.

*Habitat Use*. – Nestwatchers identified 16 separate perch locations around the lake. The bald eagle pair spent 31.7% of the observed time at lake kilometer (lk) 0.7, 14.5% at lk 0.2, 11.7% at lk 1.6, 10.6% at lk 1.0, 7.4% at lk 2.0, 7.1% at lk 1.7, 5.4% at lk 0.9, 5.0% at lk 1.9, and 6.5% at the remaining locations.

*Figure 12. Scholz Lake (left) and Sycamore (right) breeding areas. Coconino County and Maricopa County, Arizona.*

Sycamore Breeding Area (Appendix P, Figure 12)
*Observation Period.* – Full-time observations from February 4 to 19. Total monitoring 74 hours over 13 days.

*Bald Eagle Identification.* – The male and female were unbanded (unknown origin).

*Management Activities.* – 1) The FMYN restricts non-tribal member use of the river area. 2) Nestwatchers, Fort McDowell Adventures, Green Zebra Tomcar tours, and community members worked collaboratively to ensure protection of eagles and promote outreach opportunities.

*Human Activity*. – Nestwatchers recorded 14 human activities. Aircraft (helicopters and small planes) accounted for 57.1% and terrestrial activities of three types for 42.9%. One type of activity elicited one significant response from the breeding pair. The eagles left the area in response to one helicopter.

*Food Habits*. – Nestwatchers observed two forage events, with the male and female successfully foraging one fish each. Since no eggs were laid, there were no prey deliveries to the nest.

*Habitat Use*. – The Sycamore nestwatchers identified 9 separate perch locations, spanning 3.3 km along the Verde River ranging from rk 7.8 to 11.1. The bald eagle pair spent 44.8% of the observed time at rk 10.1, 24.3% at rk 7.8, 20.3% at rk 11.1, 5.3% at rk 10.0, 5.2% at rk 10.2, and 0.1% at rk 9.9.

Woods Canyon Lake Breeding Area (Appendix Q, Figure 13)
*Observation Period.* – April 15 to May. Total monitoring 158 hours over 22 days.

*Bald Eagle Identification*. – Both resident eagles were in adult plumage and unbanded (unknown origins).

*Management Activities.* – 1) The USFS enacted a closure around the nest area. 2) Nestwatchers educated recreationists about the closure and bald eagles.

*Human Activity*. – Nestwatchers recorded 442 human activities. Terrestrial activities of seven types accounted for 93.2% and water pursuits (canoes/kayaks, swimmers, stand-up paddleboards) for 6.8%. None of the activities elicited a significant response from the breeding pair.

*Food Habits*. – The nestwatchers observed 3 forage events, with fish accounting for 66.7% and birds for 33.3. The male was successful in 0% (n=2) and the female in 100% (n=1) of forage events. Due to the early failure of the nesting attempt, no prey deliveries were observed.

*Habitat Use.* – The Woods Canyon nestwatchers identified 11 perch locations around the lake. The bald eagle pair spent 58.8% of the observed time at lk 0.7, 14.3% at lk 0.8, 13.7% at lk 0.1, 8.7% at lk 4.6, and 4.6% at lk 0.6.

*Figure 13. Woods Canyon breeding area. Coconino County, Arizona.*

## MANAGEMENT CONSIDERATIONS

Management considerations included below are summarized in an edited format from the individual nestwatch reports and therefore are not opinions of the authors or the Department. We have included them as informational material for land and wildlife management agencies reviewing this report, and for further discussion at SWBEMC meetings.

### Bachelor Cove

1) We recommend that closure signage is updated to be more visible to drivers passing by on the FR647, and that a more visible sign is placed at the beginning of FR647 for drivers to understand that the cove is closed to the public. As stated in previous reports for Bachelor Cove, there is a recurring issue with vehicles pulling down to the gate at the bottom and realizing it is closed and then leaving. Occasionally people would park their vehicles by the closed gate and then walk through the cove closure as well. The majority of the time the bald eagles would watch until the vehicles and/or people were out of sight. We believe that this potential disturbance could be avoided by more proper and visible signage for both the nest closure and the cove closure leading to the water, as well as a no parking sign for the bottom of the road between each closure.

### Box Bar

1) Many visitors to Box Bar Recreation Area were unaware that a wildlife closure was in effect. Placing large, visible educational signs about closures and maps showing where closures areas are located would help limit the number of people trespassing. Nestwatchers suggest posting this information at the main Box Bar Recreation Area parking lot and the parking area off Needle Rock Road.
2) Although steps have already been taken to increase the size of the closure and some signage has been added to help protect the eagles, nestwatchers would like to recommend that the Box Bar Recreational Area is considered as a priority area to be patrolled by USFS and AGFD law enforcement, at least while the nest is active, as the number of closure violations and other activities potentially dangerous for the eagles may keep increasing as the number of visitors does as well.

### Cataract

1) Camp hosts are present at Cataract Lake Day Use Area from April through October. When Cataract Lake is not occupied by camp hosts, the entrance gate is left open and unsecured. The Day Use Area is completely devoid of trash receptacles, and as a result, the shoreline is often littered with bait and beverage containers and monofilament line. The addition of trash barrels and monofilament disposal receptacles could greatly reduce the amount and instance of littering. The camp host had mentioned that he may have fishing line disposal receptacles in storage on site, and his desire to see them installed.
2) Permanent signage should be considered, or permanently installed t-posts in which temporary signage can be securely attached. The soft closure was demarcated by sign-bearing sandwich boards and traffic barricades placed along likely avenues-of-approach to the nest tree. These barricades and sandwich boards were blown over by high winds very frequently, often breaking, and allowing recreators to enter the closure unknowingly.

Concho

1) It is recommended that a gate be hung and locked during bald eagle breeding season on the road near the pizza restaurant to reduce human activity. While access through this gate by the recreating public may be relatively infrequent, if visitors do enter the breeding area via this location, it is difficult for Nestwatchers to spot them and communicate with them before they reach the nest area. Furthermore, visitors entering from this point are highly likely to approach the lake from the southeast shore, exactly where the nest is located. It may again be noted that this happened on March 10, 2022 and caused the most critical human disturbance of this year's breeding season, with an eagle being forced to leave the nest unattended during incubation and at a time of heavy snow.
2) In terms of facilitating better communication between the Nestwatchers and visitors who are spotted approaching the nest area on the southeast shore, AGFD might also consider providing a kayak to be used on site. The observation point where the Nestwatchers are stationed is on the far opposite side of the lake from the critical nest area. If a visitor is suddenly spotted here, it is difficult to move along the perimeter of the lake on foot close enough to communicate with the visitor in time to mitigate the risk of nest disturbance. Having a kayak might allow the Nestwatchers to cross the lake quickly and approach visitors found in restricted areas more effectively.

Fort McDowell

1) Coordinate interdisciplinary meetings and on-going communication between Nestwatchers, tribal entities such as the Environmental Department, law enforcement, FMD Adventures to share information and advice.
2) Place an AGFD Sensitive Wildlife Area sign in the Fort McDowell BA prior to the 2023 breeding season. A sign was given to Karen at the Environmental Department for installation later this year.
3) If possible, develop some regulations concerning the use of drones on FMYN lands. The drone that was seen in the Rodeo BA this season clearly came from the RV park. Fortunately, the drone did not approach the nest tree. Jen consulted Raphael Bear from the RV Park about the use of drones. He said they are not allowed in the RV Park at all. Other nests may be vulnerable to drones as well and some consistent regulations from the Yavapai Nation would be helpful to keep drones away from active eagle nests.
4) Strongly encourage woodcutters with permits in the vicinity of FMYN breeding areas to cut wood elsewhere from December through June if the nearby nest is active. This truly is vital to the success of future nesting attempts. A woodcutter was heard regularly in the Sycamore BA after we stopped observations at the nest. Since the eagles were not nesting, we were not concerned with the activity at the time. Also ask FMYN Environmental staff to check for new roads that woodcutters may have made during the fall. If new roads are found prior to the breeding season AGFD signs can be put up to keep vehicles from entering too close to a nest tree once nesting season has begun.
5) Due to the presence of horseback riding tours through the Sycamore BA, outreach targeted to the wranglers/tour guides would be beneficial to provide accurate information to the public. Occasionally, wranglers gave visitors incorrect bald eagle information. Outreach through the horseback tours office might support stewardship in the BA when nestwatchers are not actively observing or during off-days.

6) Continue closure of any horse trail proximate to the Sycamore nest from December-June if the nest is active. Advise Fort McDowell Adventures Stables of this and notify them of any changes.
7) Consider providing Nestwatchers with laminated FMYN parking passes to place in their windshields when parked on the Nation. This would save law enforcement the time it takes them to stop and check our vehicles when we are out doing habitat surveys or observing from various OPs.

Goldfield

1) Install more signage at the riverside, and at the recreation area informing people of the closure, and perhaps some interpretive signage as well. It seems that many of the previous Goldfield nest watchers have requested more signage to be put up for the closure across the north side river, and it is our judgment that this needs to be done as well.
2) Add a few coin operated binoculars to the area so that people can view the eagles from a distance as a source of revenue generation that could go back into helping fund the program. Also, it would make the nestwatcher's jobs much easier as they could then direct people to look through the binoculars.
3) Provide more education about the eagles and closure for both horseback riders and pilots, including the general public, organized tour groups and law enforcement.

Greer

1) Consider establishing a small closure around the current nest area posted with unobtrusive signage. Local photographers getting too close to the nest may be becoming an issue.

Lake Pleasant (all breeding areas)

None.

Luna

1) Establish closure boundaries for the south side nest area, getting signs in place before the breeding season.
2) Repair the downed fence on the south side waterfowl closure at the water's edge, and maintenance on the waterfowl breeding signage, fencing, and closure buoys which have been ignored for too long.
3) All USFS projects impacting the Luna Lake Breeding Area should be discussed in advance with AGFD Bald Eagle management team and Nest Watchers prior to implementation.
4) Luna Lake is a unique breeding area and the presence of Nest Watchers is of great benefit to the success of the resident breeding pair. Since recreational demands are constantly increasing, it is extremely important to remain proactive in establishing and implementing a well thought out management plan.

Orme

1) We recommend that more barricades be used alongside the closure signs on the inner 3 Pole road, enough that people cannot drive around them, which was a common occurrence during the beginning of the season. We would also like to recommend utilizing something less easily moved or knocked down than the current barricades, if possible. There were a

few occurrences where nestwatchers witnessed people simply move the barricades to the side and proceed into the closure area. Additionally there were two separate occurrences where a nestwatcher watched a pickup truck drive straight through and over the barricades in place at the N Fort Dowell Road closure.

2) Having a structure at the Orme #7 nest observation point that we were able to secure a tarp to for shade was extremely helpful throughout the season. On several occasions the wind was so strong that the tarp would make excessive noise, because of this we would like to recommend implementing a more permanent roof on the metal structure instead of a tarp.
3) The gate on Fort McDowell Road at the boundary of the SRPMIC was frequently left open, or blown open by the wind if poorly secured. This would often lead to a variety of people entering the property who would not have come in had the gate been properly closed. On a few occasions people had come through the gate while it was open and then not been able to figure out how to get out when they returned to the gate and found it locked. To avoid these situations in the future a different system for keeping the gate closed would be recommended.

Scholz Lake

1) Observations during the 2021 and 2022 breeding seasons indicate that human activity may have more impact on the eagle's breeding effort than previously thought. Consider assigning nestwatchers to monitor the area in a regular basis to obtain enough comparative data on this impact.
2) Although we do not consider that a closure around the nest tree is necessary, given its distance to the lake, we still believe some signage should be placed on both west and north shores stressing the importance of avoiding the northwest corner of the lake during the breeding season. Such signage must be officially supported with AGFD and/or USFS logos and any relevant legislation, as the signs that currently exist are handmade, plain and do not seem to impose any attention from passersby.
3) Place fishing line and tackle disposal tubes. Good places are the south corner of the lake, by the dam, and the parking lot.

Woods Canyon

1) Place a closure around the nest ahead of the public opening of the lake. Results from the 2020 and 2021 seasons strongly indicate that it is necessary to establish a closure around the nest tree and adjacent area before Woods Canyon Lake and its recreational areas are open to the public for the season. Although resident adult eagles in the lake can become very tolerant to human activities over the years, new adults that replace non-returning residents may experience a shocking impact when human activity in their breeding area drastically increases overnight. The fact that the current nest tree is located no more than 20 yards from one of the main trails that surrounds the lake, and that it may be reutilized during the next breeding season, adds up to the urgency of setting up a closure and/or close the section of the trail that runs just north of the nest area.
2) Post drone flying information. Drone activity at the lake and elsewhere was relatively frequent and is likely to keep increasing over the years. It will be helpful to post signage at the boat dock and campgrounds warning recreationists about flying drones near the eagle's nest (with updated nest and OP locations) and provide nestwatchers with current

information about laws permitting (or not) flying drones inside the different recreational areas.

3) Add more or bigger fishing line and tackle disposal tubes. The ones already installed get filled quickly and are usually overflowing with that and other trash. More at the docks and one at the Spillway parking lot are specially needed.
4) Return to or add the use of the red STOP signs to mark the closure, as letter-type postings (used this season) are not as eye-catching as the former and can be easily ignored or overlooked at a certain distance. We observed only two instances of people actually stopping to read the postings whether they violated the closure or not.

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## APPENDIX A: 2022 ARIZONA BALD EAGLE WINTER COUNT RESULTS

Table 10. 2022 Arizona bald eagle winter count volunteer survey results (continued next page).

| Route Number | Route Name | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagles | Unknown Eagles |
|---|---|---|---|---|---|---|
| **Apache County** | | | | | | |
| 1 | Becker Lake | 60 | 0 | 2 | 0 | 0 |
| 2 | Little Colorado River | 50 | 0 | 0 | 0 | 0 |
| 3 | S. Fork LCR – Campground | 70 | 0 | 0 | 0 | 0 |
| 4 | Casa Malpais – LCR | 31 | 0 | 0 | 0 | 0 |
| 5 | Greer Lakes | 85 | 0 | 0 | 0 | 0 |
| 6 | Sponseller Lake | 30 | 1 | 0 | 0 | 0 |
| 7 | Mexican Hay Lake | 45 | 0 | 0 | 0 | 0 |
| 8 | White Mountain Hereford Ranch | 90 | 0 | 0 | 0 | 0 |
| 9 | The Ranch Lake | 30 | 0 | 0 | 0 | 0 |
| 10 | Ortega Lake | 60 | 0 | 0 | 0 | 0 |
| 11 | Concho Lake | 45 | 2 | 0 | 0 | 0 |
| 12 | Luna Lake | 180 | 3 | 2 | 0 | 0 |
| 13 | Nelson Reservoir | 30 | 0 | 0 | 0 | 0 |
| 14 | Nutrioso Reservoir | 120 | 1 | 1 | 0 | 0 |
| 16 | San Francisco River | Not surveyed. | | | | |
| **Total** | | **926** | **7** | **5** | **0** | **0** |
| **Cochise County** | | | | | | |
| 18 | Parker Canyon Lake | 2 | 1 | 0 | 0 | 0 |
| 19 | Willcox Playa | 180 | 0 | 0 | 0 | 0 |
| **Total** | | **182** | **1** | **0** | **0** | **0** |
| **Coconino County** | | | | | | |
| 21 | Long Lake Complex | 195 | 0 | 0 | 0 | 0 |
| 22 | Stoneman Lake | 170 | 2 | 1 | 0 | 0 |
| 23 | FH-3 | 35 | 0 | 0 | 0 | 0 |
| 24 | I-17, Section to Flagstaff | 220 | 1 | 0 | 0 | 2 |
| 25 | Bellemont | 335 | 4 | 2 | 0 | 0 |
| 26 | Townsend/Winona A/B | 435 | 1 | 0 | 0 | 0 |
| 27 | HWY 89 North /Sunset Crater – Wupatki | 350 | 6 | 2 | 0 | 0 |
| 28 | FH-3 Lakes (Mary, Mormon, Marshall, Prime, etc.) | 374 | 2 | 1 | 0 | 0 |
| 29 | Continental Country Club Lakes | 196 | 1 | 1 | 0 | 0 |
| 30 | Chevelon Canyon Lake | 130 | 2 | 2 | 0 | 0 |
| 32 | Spring Valley Wash | 180 | 2 | 0 | 0 | 0 |
| 33 | Red Lake Valley | 180 | 0 | 0 | 0 | 0 |
| 34 | Kaibab Lake | 60 | 0 | 0 | 0 | 0 |
| 35 | Pittman Valley | 22 | 0 | 0 | 0 | 0 |
| 36 | Davenport Lake | 10 | 0 | 0 | 0 | 0 |
| 37 | Scholz Lake | 60 | 2 | 1 | 0 | 0 |
| 38 | Cataract Lake | 45 | 3 | 0 | 1 | 0 |
| 39 | Willow Springs Lake | 169 | 0 | 0 | 0 | 0 |
| 40 | West Chevelon Canyon | 94 | 0 | 0 | 0 | 0 |
| 41 | Willow Creek | 118 | 0 | 0 | 0 | 0 |
| 42 | White Horse Lake – Pomeroy Tanks | 90 | 2 | 1 | 0 | 1 |

Table 10 continued.

| Route Number | Route Name | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagles | Unknown Eagles |
|---|---|---|---|---|---|---|
| 43 | JD Dam Lake | 75 | 1 | 0 | 0 | 0 |
| 45 | Steel/Stone Road | 120 | 1 | 2 | 0 | 0 |
| 48 | Blue Stem Wash-Babbit property | 150 | 1 | 0 | 0 | 1 |
| 49 | Glen Canyon Nat'l Rec. Area (Lake Powell to Lee's Ferry) | Not surveyed. | | | | |
| 118 | Bill Williams Loop Road | Not surveyed. | | | | |
| 119 | Johnson Canyon | Not surveyed. | | | | |
| 120 | Highway 64 east | Not surveyed. | | | | |
| 121 | Highway 64 | Not surveyed. | | | | |
| 122 | Camp Navajo | 175 | 2 | 0 | 0 | 0 |
| 123 | Partridge Creek | Not surveyed. | | | | |
| 124 | Odell Lake | 50 | 0 | 0 | 0 | 0 |
| 125 | Highway 87 north | 20 | 0 | 0 | 0 | 0 |
| 126 | Highway 180 | 150 | 0 | 0 | 0 | 0 |
| **Total** | | **4,208** | **33** | **13** | **1** | **4** |
| **Gila County** | | | | | | |
| 129 | Buckhead Mesa landfill | 45 | 10 | 2 | 0 | 0 |
| **Total** | | **45** | **10** | **2** | **0** | **0** |
| **Graham County** | | | | | | |
| 51 | Point of Pines Lake area (ground) | Not surveyed. | | | | |
| **Mohave County** | | | | | | |
| 57 | Alamo Lake | 106 | 4 | 0 | 0 | 0 |
| **Total** | | **106** | **4** | **0** | **0** | **0** |
| **Navajo County** | | | | | | |
| 58 | Lake of the Woods | 40 | 1 | 3 | 0 | 0 |
| 59 | Rainbow Lake | 37 | 3 | 5 | 6 | 0 |
| 61 | Whipple Lake | 30 | 0 | 0 | 0 | 0 |
| 62 | Long Lake | 30 | 0 | 0 | 0 | 0 |
| 63 | Lone Pine Dam | 50 | 0 | 0 | 0 | 0 |
| 64 | Schoens Reservoir | 50 | 0 | 0 | 0 | 0 |
| 65 | White Mountain Lake | 90 | 0 | 1 | 0 | 0 |
| 67 | Jacques Marsh | 55 | 1 | 0 | 0 | 0 |
| 68 | Scott's Reservoir | 20 | 0 | 1 | 0 | 0 |
| 69 | Show Low Lake | 45 | 1 | 0 | 0 | 0 |
| 70 | Pintail Lake | 30 | 1 | 0 | 0 | 0 |
| 71 | Telephone Lake | 30 | 0 | 1 | 0 | 0 |
| 72 | Fool Hollow Lake | 50 | 0 | 0 | 0 | 0 |
| 75 | Cottonwood Wash/ Clay Springs | 30 | 0 | 0 | 0 | 0 |
| 76 | White Lake | 10 | 0 | 0 | 0 | 0 |
| 127 | Mortenson Wash | 60 | 5 | 0 | 0 | 0 |
| **Total** | | **657** | **12** | **11** | **6** | **0** |
| **Santa Cruz County** | | | | | | |
| 82 | Pena Blanca Lake | 60 | 0 | 0 | 0 | 0 |
| **Total** | | **60** | **0** | **0** | **0** | **0** |
| **Yavapai County** | | | | | | |
| 83 | Wet Beaver Creek | 540 | 0 | 0 | 0 | 0 |
| 84 | Oak Creek | 485 | 3 | 0 | 0 | 0 |
| 85 | Willow Lake | 240 | 2 | 1 | 0 | 0 |

Table 10 continued.

| Route Number | Route Name | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagles | Unknown Eagles |
|---|---|---|---|---|---|---|
| 86 | Lynx Lake | 240 | 3 | 1 | 0 | 0 |
| 87 | Watson Lake | 240 | 2 | 3 | 0 | 0 |
| 88 | Goldwater Lake | 240 | 2 | 0 | 0 | 0 |
| **Total** | | **1,985** | **12** | **5** | **0** | **0** |
| **Yuma and La Paz Counties** | | | | | | |
| 89 | Imperial N.W.R. Cibola/Martinez Lake – Colorado River | 120 | 1 | 0 | 0 | 0 |
| **Total** | | **120** | **1** | **0** | **0** | **0** |

Table 11. 2022 Arizona bald eagle winter count helicopter survey results.

| Route Number | Route Name | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagles | Unknown Eagles |
|---|---|---|---|---|---|---|
| 90 | Verde River | 131 | 27 | 7 | 0 | 0 |
| 91 | Lower East Verde River | 8 | 0 | 0 | 0 | 0 |
| 92 | Lower West Clear Creek | 16 | 0 | 0 | 0 | 0 |
| 93 | Lower Salt River | 118 | 19 | 8 | 0 | 0 |
| 94 | Upper Salt River | 82 | 1 | 0 | 0 | 0 |
| 95 | Lower Tonto Creek | 27 | 5 | 0 | 0 | 0 |
| 97 | Lower Canyon Creek | 8 | 0 | 0 | 0 | 0 |
| 98 | Lower Cibecue Creek | 15 | 0 | 0 | 0 | 0 |
| 100 | White River | 19 | 0 | 0 | 0 | 0 |
| 101 | North Fork White River | 67 | 9 | 2 | 0 | 0 |
| 102 | Lower Black River | 67 | 10 | 2 | 0 | 0 |
| 103 | Big and Little Bonito Creeks | 0 | 0 | 0 | 0 | 0 |
| 104 | San Carlos River–Talkalai Lake | 17 | 1 | 1 | 0 | 0 |
| 105 | San Carlos Reservoir | 15 | 3 | 0 | 0 | 0 |
| 106 | Upper and Lower Gila River | 56 | 4 | 0 | 0 | 0 |
| 107 | Eagle Creek | 35 | 1 | 0 | 0 | 0 |
| 108 | Bonita Creek | 12 | 0 | 0 | 0 | 0 |
| 109 | Lower San Francisco River | 33 | 0 | 0 | 0 | 0 |
| 110 | Blue River | 12 | 0 | 0 | 0 | 0 |
| 111 | Sunrise Lake | 2 | 0 | 0 | 0 | 0 |
| 112 | Big Lake | 4 | 0 | 0 | 0 | 0 |
| 114 | Crescent Lake | 2 | 1 | 0 | 0 | 0 |
| 115 | Lake Pleasant | 29 | 4 | 1 | 0 | 0 |
| 116 | Del Rio Ponds | 1 | 2 | 0 | 0 | 0 |
| 117 | Tres Rios | 25 | 2 | 0 | 0 | 0 |
| 128 | Point of Pines aerial | 45 | 10 | 2 | 0 | 0 |
| **Total** | | **846** | **99** | **23** | **0** | **0** |

Table 12. 2022 Arizona bald eagle winter count non-standardized survey route results.

| Route Number | Route Name | County | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagles | Unknown Eagles |
|---|---|---|---|---|---|---|---|
| 130 | Cibola NWR | La Paz, Yuma | 202 | 0 | 1 | 0 | 0 |
| 976 | West Clear Creek | Yavapai | 165 | 0 | 0 | 0 | 0 |
| 986 | Kachina Wetlands | Coconino | 50 | 0 | 0 | 0 | 0 |
| 991 | Clint's Well to Camp Verde | Coconino, Yavapai | 70 | 1 | 0 | 0 | 0 |
| **Total** | | | **487** | **1** | **1** | **0** | **0** |

## APPENDIX B: 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. Operationally, a BA is recognized only after an active nest has been documented. Once a BA is established, we consider it a BA whether it is occupied by bald eagles in a given year or not, until or unless it is designated historic (i.e., ten consecutive years unoccupied).

Historic BA: A BA that has remained unoccupied for ten consecutive years. This term also applies to BAs identified before the 1970s.

Occupied BA: An area with at least one nest structure 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 1 bird in immature plumage at or near a nest, if mating behavior was observed (display flight, nest repair, copulation).

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

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

Successful BA/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 BA/Nest: An active nest from which no young fledged regardless of cause.

Productivity: The number of young fledged per occupied BA.

Reoccupied Historic BA: A historic BA which shows signs indicative of being occupied.

Pioneer Effort: The occupancy of a new BA, in previously undocumented breeding habitat, where there is no evidence of prior activity. These occur in areas monitored by the ORA flights before discovery due to: 1) the presence of a large nest built by another or unknown species, or 2) the observed suitability of the habitat.

Previously Existing BA: A new BA that shows signs of prior occupancy (e.g. multiple large nests) and/or signs of prior activity (e.g. prey remains below an existing nest) upon discovery.

## APPENDIX C: 2022 ARIZONA BALD EAGLE PRODUCTIVITY

Table 13. Arizona bald eagle breeding area productivity, 2022.

| Breeding Area | Status[1] | Nest[2] | Incubation Date | Eggs[3] | Hatch Date | Young | Fledge Date | Fledged |
|---|---|---|---|---|---|---|---|---|
| Alamo | S | 8 | <1/11 | 2 | 1/11-2/16 | 2 | <4/5 | 2 |
| Armer Gulch | U | No new nests and no eagles. | | | | | | |
| Ashurst | O | All known nests empty. Pair of adults in area. | | | | | | |
| Bachelor Cove* | S | 3 | <1/10 | 2 | 1/10-2/4 | 2 | 4/23, >4/23 | 2 |
| Bartlett | S | 6 | <1/7 | 2 | 1/31-3/11 | 2 | 4/20-5/9 | 2 |
| Beaver | S | 1 | 1/7-1/31 | 2 | 1/31-3/17 | 2 | >5/9 | 1 |
| Becker | O | All known nests empty. Pair of adults in area. | | | | | | |
| Bill Williams | U | No new nests and no eagles. | | | | | | |
| Black Cross | S | 1 | <1/10 | 1 | 1/31-3/15 | 1 | >5/9 | 1 |
| Blue Point | F | 10 | <1/10 | 3 | Failed 1/31-3/15. | | | |
| Box Bar* | F | 5 | 2/12 | 1 | 3/21 | 1 | Failed 3/27-4/2 | |
| Buckeye | U | All known nests empty. No eagles. | | | | | | |
| Bulldog | S | 3 | 1/10-1/31 | 1 | 1/31-3/15 | 1 | >5/9 | 1 |
| Burro Creek | U | No new nests and no eagles. | | | | | | |
| Campaign Bay | U | No new nests and no eagles. | | | | | | |
| Canyon De Chelly | S | 3 | 3/7-3/14 | 2 | <6/6 | 2 | >6/6 | 2 |
| Cataract Lake* | S | 1 | <3/1 | 2 | 3/1-3/17 | 2 | 5/22 | 1 |
| Cedar Basin | U | All known nests empty. One adult in area. | | | | | | |
| Chevelon | F | 5 | <5/9 | 1 | <5/9 | 1 | Failed 5/9-6/3 | |
| Cibecue | A | 9 | 2/1-3/16 | 1 | 3/16-4/18 | 1 | Final status unknown. | |
| Cliff | U | No new nests and no eagles. | | | | | | |
| Coldwater | U | All known nests empty. No eagles. | | | | | | |
| Cole's Bay* | O | All known nests empty. Pair of adults in area. | | | | | | |
| Concho* | S | 2 | 2/5 | 2 | 3/11 | 2 | 6/7 | 2 |
| Coolidge | F | 5 | 1/10-2/1 | 2 | 2/1-3/16 | 2 | Failed 3/16-4/13 | |
| Crescent | F | 1 | <1/12 | 1 | Failed 1/12-2/1. May have been false incubation in January. | | | |
| Dogtown | S | 3 | <3/17 | 1 | 3/17-4/20 | 1 | >7/5 | 1 |
| Doka* | S | 9 | 1/7-1/31 | 1 | 1/31-3/17 | 1 | 5/14-5/15 | 1 |
| Eagle Mountain | U | All known nests empty. No eagles. | | | | | | |
| East Verde | F | 8 | 1/7-1/31 | 1 | Failed 3/17-4/20 | | | |
| Eastern Star | S | 1 | <5/31 | 1 | <5/31 | 1 | >6/23 | 1 |
| Elaine | O | All known nests empty. Pair of adults in area. | | | | | | |
| Fish Creek | F | 1 | <1/10 | 1 | Failed 1/31-3/15 | | | |
| Fool Hollow | S | 4 | 1/12-1/31 | 2 | 2/20-2/25 | 2 | 5/12-5/19 | 2 |

[1]Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.
[2]Nest numbers are from Hunt and others 1992; Driscoll and Beatty 1994; Driscoll and others 1992, 1995a, 1995b, 1997-1999; Jacobson and others 2004-2007; Koloszar and Driscoll 2001a, 2001b; Koloszar and others 2002; Canaca and others 2004; McCarty and Jacobson 2008-2012; McCarty et al. 2013-2021.
[3]Represents minimum number of eggs laid.
*Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 13 continued.

| Breeding Area | Status[1] | Nest[2] | Incubation Date | Eggs[3] | Hatch Date | Young | Fledge Date | Fledged |
|---|---|---|---|---|---|---|---|---|
| Fort McDowell* | F | 21 | <1/7 | 1 | Failed 1/31-2/20 | | | |
| Gainey Ranch | S | 3 | <1/6 | 2 | 1/6-2/15 | 2 | 5/2, 5/2-5/6 | 2 |
| Garden Lakes | S | 2 | <12/19 | 3 | 1/17-1/19 | 3 | 3/29-4/8, 4/15 | 3 |
| George's Basin | U | All known nests empty. One adult in area. | | | | | | |
| Gilbert | U | No nests or eagles reported. | | | | | | |
| Goldfield* | S | 5 | <1/10 | 2 | 1/10-2/5 | 2 | 4/17, 4/21 | 2 |
| Granite Basin | O | All known nests empty. Pair of adults in area. | | | | | | |
| Granite Reef* | O | All known nests empty. Pair of adults in area. | | | | | | |
| Green River | F | 2 | <1/7 | 1 | Failed 1/31-3/17 | | | |
| Greer Lakes | S | 7 | 2/1-3/16 | 2 | 3/16-4/18 | 2 | 7/21, 7/22 | 2 |
| Horse Mesa | F | 5 | <1/10 | 2 | Failed by 3/15. | | | |
| Horseshoe | F | 13 | 1/7-1/31 | 1 | 1/31-3/17 | 1 | Failed 3/17-4/20 | |
| Ive's Wash | F | 4 | 1/11-1/31 | 1 | Failed 1/31-2/17 | | | |
| Kachina Village | S | 1 | 2/2-2/28 | 1 | 2/28-4/15 | 1 | 6/22 | 1 |
| Kaibab Lake | S | 8 | <3/1 | 2 | 3/1-4/20 | 2 | >5/24 | 2 |
| Kerr* | U | All known nests empty. No eagles. | | | | | | |
| Ladders | S | 4 | 1/7-1/31 | 2 | 1/31-3/17 | 2 | >5/24 | 2 |
| Lone Pine | O | Pair of adults in area. | | | | | | |
| Lower Lake Mary | S | 5 | 2/3-3/17 | 2 | 3/17-4/20 | 1 | >6/7 | 1 |
| Luna* | F | 1 | 1/19-2/5 | 1 | 3/4 | 1 | Failed 4/12 | |
| Lynx | F | 7 | 1/7-1/31 | 1 | Failed 2/22 | | | |
| Mohave | U | All known nests empty. No eagles. | | | | | | |
| Nevada Bay | U | All known nests empty. One adult in area. | | | | | | |
| North Fields | S | 1 | <12/22 | 1 | 12/22-2/2 | 1 | 4/13 | 1 |
| Oak Creek | S | 5 | 1/7-1/31 | 2 | 1/31-3/16 | 2 | 5/9-5/24 | 1 |
| Orme* | S | 7 | 1/7-1/31 | 2 | 2/14-2/28 | 2 | 5/9-5/13 | 2 |
| OW | O | All known nests empty. Pair of adults in area. | | | | | | |
| Pee Posh Wetlands | S | 9 | <1/7 | 2 | 1/7-3/17 | 2 | 4/19 | 1 |
| Perkinsville | U | All known nests empty. One adult in area. | | | | | | |
| Pinal | F | 9 | 2/1-3/16 | 1 | 3/16-4/18 | 1 | Failed 5/9-6/6 | |
| Pinto | S | 10 | 1/10-2/1 | 1 | 2/10-3/16 | 1 | >5/9 | 1 |
| Pleasant* | F | 5 | <1/7 | 2 | 1/31-2/13 | 2 | Failed 3/6 | |
| Rainbow | F | 2 | <1/7 | 1 | Failed 1/31-3/17 | | | |
| Redmond | O | All known nests empty. Pair of adults in area. | | | | | | |
| Riggs | F | 1 | <4/20 | 1 | Failed 4/27-5/13 | | | |
| Riverside Ruin | S | 2 | <1/10 | 2 | 1/31-2/7 | 2 | 4/12-4/15, 4/20 | 2 |

[1]Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.
[2]Nest numbers are from Hunt and others 1992; Driscoll and Beatty 1994; Driscoll and others 1992, 1995a, 1995b, 1997-1999; Jacobson and others 2004-2007; Koloszar and Driscoll 2001a, 2001b; Koloszar and others 2002; Canaca and others 2004; McCarty and Jacobson 2008-2012; McCarty et al. 2013-2021.
[3]Represents minimum number of eggs laid.
*Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 13 continued.

| Breeding Area | Status[1] | Nest[2] | Incubation Date | Eggs[3] | Hatch Date | Young | Fledge Date | Fledged |
|---|---|---|---|---|---|---|---|---|
| Rodeo* | S | 6 | <1/7 | 2 | 2/14-2/20 | 2 | 5/9-5/12, 5/13 | 2 |
| Saguaro | S | 2 | <1/10 | 1 | 1/31-2/9 | 1 | 4/18-5/9 | 1 |
| San Carlos | U | No new nests or eagles. | | | | | | |
| Scholz Lake* | F | 1 | <3/17 | 2 | 3/17-4/20 | 2 | Failed 6/17 | |
| Seventy-six | S | 7 | 1/10-2/1 | 2 | 2/1-3/16 | 2 | >5/9 | 2 |
| Sheep | S | 8 | 1/10-2/1 | 2 | 2/1-3/16 | 2 | >5/19 | 2 |
| Sheep Creek | U | All known nests empty. One adult in area. | | | | | | |
| Show Low Lake | S | 1 | 1/12-2/1 | 2 | 4/7-4/8 | 2 | 7/3-7/4, >7/4 | 2 |
| Silver Creek | S | 3 | <2/1 | 2 | 2/1-3/16 | 1 | >5/19 | 1 |
| Suicide | F | 1 | <1/10 | 1 | Failed 2/1-2/15 | | | |
| Sullivan Lake | S | 4 | 1/7-1/11 | 2 | 1/31-3/17 | 2 | >5/5 | 2 |
| Sycamore* | O | All known nests empty. Pair of adults in area. | | | | | | |
| Table Mountain | S | 4 | 1/31-3/17 | 2 | 3/17-4/20 | 2 | >5/26 | 1 |
| Talkalai | S | 10 | <1/10 | 2 | 2/1-2/15 | 1 | >3/16 | 1 |
| Tall Pine | F | 1 | 2/1-3/16 | 1 | Failed after 3/16 | | | |
| Tapco | U | All known nests empty. One adult in area. | | | | | | |
| Tonto* | O | All known nests empty. Pair of adults in area. | | | | | | |
| Tortilla Creek | S | 1 | 1/31-3/15 | 2 | 3/15-4/18 | 1 | >6/8 | 1 |
| Tremaine | S | 2 | <3/28 | 2 | 3/28-4/19 | 2 | >6/13 | 2 |
| Two Bar | F | 2 | <1/10 | 1 | Failed 1/10-2/1 | | | |
| | F | 1 | 3/1-3/16 | 1 | Failed 3/16-4/18 | | | |
| Water Nest | U | All known nests empty. No eagles. | | | | | | |
| Whiskey Spring* | F | 2 | 1/7-1/31 | 2 | Failed 1/31-2/4 | | | |
| | F | 2 | 2/4-3/17 | 1 | Failed 3/17-3/28 | | | |
| White Horse | U | All known nests empty. No eagles. | | | | | | |
| Woods Canyon* | F | 14 | <4/15 | 1 | Failed 5/8-5/13 | | | |
| Yellow Cliffs | S | 1 | 1/7-1/31 | 2 | 1/31-3/17 | 2 | >5/20 | 2 |

[1]Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.
[2]Nest numbers are from Hunt and others 1992; Driscoll and Beatty 1994; Driscoll and others 1992, 1995a, 1995b, 1997-1999; Jacobson and others 2004-2007; Koloszar and Driscoll 2001a, 2001b; Koloszar and others 2002; Canaca and others 2004; McCarty and Jacobson 2008-2012; McCarty et al. 2013-2021.
[3]Represents minimum number of eggs laid.
*Nests monitored by the Arizona Bald Eagle Nestwatch Program.

## APPENDIX D: NEST SURVEY RESULTS

Table 14. Results of the 2022 bald eagle winter count, ORA, and nest survey flights (continued next page).

| Location | Time | Comments |
|---|---|---|
| **January 7, 2022** | | |
| Orme BA | 0804 | All known nests empty. Pair of adults perched. |
| Rodeo BA | 0809 | Adult incubating in nest #6. |
| Sycamore BA | 0815 | All known nests empty. Nest #6 fallen. |
| Doka BA | 0820 | Pair of adults at a new nest (#9). |
| Fort McDowell BA | 0827 | Adult incubating in nest #21. |
| Box Bar BA | 0830 | Pair of adults standing in nest #5. |
| Needle Rock BA | 0831 | No new nests or eagles. |
| Bartlett BA | 0841 | Adult incubating in nest #6. |
| Yellow Cliffs BA | 0848 | All known nests empty. No eagles. |
| Sheep Creek BA | 0900 | All known nests empty. No eagles. |
| Cliff BA | 0903 | No new nests. No eagles. |
| Horseshoe BA | 0915 | All known nests empty. Pair of adults perched. |
| Table Mountain BA | 0928 | Pair of adults perched at nest #4. |
| East Verde BA | 0937 | All known nests empty. No eagles. |
| East Verde River | 0942 | No new nests. No eagles. |
| Coldwater BA | 0959 | All known nests empty. No eagles. |
| Ladders BA | 1005 | All known nests empty. No eagles. |
| West Clear Creek | 1013 | No new nests or eagles. |
| Beaver BA | 1135 | All known nests empty. One adult perched. |
| Oak Creek BA | 1143 | All known nests empty. No eagles. |
| Green River BA | 1150 | Adult incubating in new nest #2. Second adult perched. |
| Tapco BA | 1155 | All known nests empty. No eagles. |
| Tower historic BA | 1203 | All known nests empty. No eagles. |
| Mormon Pocket golden eagle BA | 1210 | All known nests empty. No eagles. |
| Perkinsville BA | 1212 | All known nests empty. No eagles. |
| Hell Point golden eagle BA | 1225 | All known nests empty. No eagles. |
| Muldoon nest site | 1233 | All known nests empty. No eagles. |
| Granite golden eagle BA | 1235 | All known nests empty. No eagles. |
| Sullivan Lake BA | 1243 | Pair of adults perched. New large nest #4 found. |
| Lynx BA | 1425 | All known nests empty. No eagles. |
| Pleasant BA | 1446 | Adult incubating in nest #5. |
| Whiskey Spring BA | 1449 | Pair of adults perched. All known nests empty. |
| Cole's Bay BA | 1505 | One adult standing in nest #1. |
| Rainbow BA | 1536 | Adult incubating in nest #2. |
| Buckeye BA | 1538 | All known nests empty. No eagles. |
| Pee Posh Wetlands BA | 1555 | Adult incubating in nest #9. |
| **January 10, 2022** | | |
| Riverside BA | 0754 | Adult incubating in nest #2. |
| Granite Reef BA | 0800 | All known nests empty. No eagles. Nest #2 fallen. |
| Kerr BA | 0804 | No new nests. One adult perched at Coon Bluff. |
| Goldfield BA | 0810 | Adult incubating in nest #5. |
| Bulldog BA | 0816 | One adult standing in nest #3. |
| Blue Point BA | 0824 | Adult incubating in nest #10. |
| Saguaro BA | 0830 | Adult incubating in nest #2. |

Table 14 continued.

| Location | Time | Comments |
|---|---|---|
| Tortilla Creek BA | 0834 | Two adults standing in nest #1. |
| Black Cross BA | 0838 | Adult incubating in nest #1. |
| Fish Creek BA | 0844 | Adult incubating in nest #1. |
| Horse Mesa BA | 0849 | Adult incubating in nest #5. |
| Two Bar BA | 0905 | Adult incubating in nest #2. |
| Bachelor Cove BA | 0908 | Two unattended eggs in nest #3. No eagles. |
| Tonto BA | 0915 | All known nests empty. Nest #9 fallen. One adult perched. |
| Sheep BA | 0924 | One adult standing in nest #8. |
| 76 BA | 0937 | All known nests empty. One adult perched in tree. |
| Pinto BA | 1020 | All known nests empty. One adult perched in nest #10 tree. |
| Campaign Bay BA | 1022 | No new nests or eagles. |
| Pinal BA | 1223 | All known nests empty. One adult flying. |
| Redmond BA | 1231 | All known nests empty. No eagles. |
| Canyon historic BA | 1251 | No new nests or eagles. |
| Talkalai BA | 1420 | Adult incubating in nest #10. |
| Suicide BA | 1447 | Adult incubating in nest #1. Second adult flying. |
| Coolidge BA | 1525 | Adult standing in nest #5. |
| Granite Basin BA | 1533 | Pair of adults standing in nest #2. |
| **January 12, 2022** | | |
| Cibecue BA | 0830 | All known nests empty. No eagles. |
| Cibecue Crossing nest site | 0836 | All known nests empty. No eagles. |
| Mule Hoof historic BA | 0859 | All known nests empty. No eagles. |
| Cedar Basin BA | 0919 | All known nests empty. No eagles. |
| Lone Pine BA | 0927 | All known nests empty. No eagles. |
| Fool Hollow BA | 1103 | All known nests empty. No eagles. |
| Show Low BA | 1109 | All known nests empty. No eagles. |
| Tall Pine nest site | 1137 | All known nests empty. No eagles. |
| Eagle Mountain BA | 1153 | All known nests empty. No eagles. |
| Crescent BA | 1205 | One adult in nest #1, appeared to be sitting in incubation posture. |
| George's Basin BA | 1305 | All known nests empty. No eagles. |
| **January 31, 2022** | | |
| Riverside BA | 0756 | Adult incubating in nest #2. |
| Granite Reef BA | 0803 | All known nests empty. No eagles. |
| Goldfield BA | 0808 | Adult in nest #5 appeared to be brooding nestlings. Second adult flying. |
| Bulldog BA | 0813 | Adult incubating in nest #3. |
| Blue Point BA | 0816 | Three unattended eggs in nest #10. No eagles. |
| Bagley historic BA | 0818 | All known nests empty. No eagles. |
| Saguaro BA | 0819 | Adult incubating in nest #2. |
| Tortilla Creek BA | 0822 | Two adults standing in nest #1. |
| Black Cross BA | 0824 | Adult incubating in nest #1. |
| Fish Creek BA | 0826 | One unattended egg in nest #1. No eagles. |
| Horse Mesa BA | 0830 | Adult incubating in nest #5. |
| Orme BA | 0839 | Adult incubating in nest #7. Second adult perched. |
| Rodeo BA | 0840 | Adult incubating or brooding in nest #6. |
| Sycamore BA | 0844 | Two adults perched in nest tree #7. |
| Doka BA | 0846 | Adult incubating in new nest #9. |
| Fort McDowell BA | 0849 | Adult incubating or brooding in nest #21. |
| Box Bar BA | 0851 | All known nests empty. No eagles. |

Table 14 continued.

| Location | Time | Comments |
|---|---|---|
| Bartlett BA | 0859 | Adult incubating in nest #6. Second adult perched. |
| Yellow Cliffs BA | 0902 | Adult incubating in nest #1. |
| Sheep Creek BA | 0905 | One adult perched by nest #1. |
| Cliff BA | 0908 | No new nests or eagles. |
| Horseshoe BA | 0913 | Adult incubating in nest #13. |
| Table Mountain BA | 0922 | Two adults standing in nest #4. |
| East Verde BA | 0926 | Adult incubating in nest #8. Second adult perched. |
| Coldwater BA | 0933 | All known nests empty. No eagles. |
| Ladders BA | 0939 | Adult incubating in nest #4. |
| Beaver BA | 0952 | Adult incubating in nest #1. |
| Oak Creek BA | 0957 | Adult incubating in nest #5. |
| Green River BA | 1055 | Adult incubating in nest #2. |
| Tapco BA | 1100 | All known nests empty. One adult flying upstream. |
| Tower historic BA | 1109 | All known nests empty. No eagles. |
| Mormon Pocket golden eagle BA | 1114 | All known nests empty. No eagles. |
| Perkinsville BA | 1118 | One adult perched at nest #4. |
| Hell Point golden eagle BA | 1127 | All known nests empty. No eagles. |
| Muldoon nest site | 1130 | All known nests empty. No eagles. |
| Granite golden eagle BA | 1133 | All known nests empty. No eagles. |
| Sullivan Lake BA | 1138 | Adult incubating in new nest #4. |
| Goldwater Lake | 1150 | No new nests or eagles. |
| Lynx BA | 1155 | Adult incubating in nest #7. |
| Burro Creek BA | 1357 | No new nests or eagles. |
| Big Sandy River | 1405 | Searched trees down to lake. No nests or eagles. |
| Alamo Lake BA | 1409 | Adult incubating in nest #9. Second adult perched. |
| Ive's Wash BA | 1412 | Adult incubating in nest #4. |
| Cole's Bay BA | 1445 | All known nests empty. No eagles. |
| Whiskey Spring BA | 1446 | Two eggs in nest #2. One adult perched near nest. |
| Pleasant BA | 1450 | Adult incubating in nest #5. |
| Rainbow BA | 1509 | Adult incubating in nest #2. |
| Buckeye BA | 1511 | All known nests empty. Nest #2 fallen. No eagles. |
| Pee Posh Wetlands BA | 1519 | Adult incubating or brooding in nest #9. |
| Garden Lakes BA | 1523 | Adult in nest #2 with two nestlings, 1.5-2 weeks old. |
| **February 1, 2022** | | |
| Chalk Mountain nest site | 0805 | New large nest #1 in snag. Pair of adults perched in snag. |
| 76 BA | 0822 | Adult incubating in nest #7. |
| Sheep BA | 0829 | Adult incubating in nest #8. |
| Tonto BA | 0833 | All known nests empty. No eagles. |
| Bachelor Cove BA | 0843 | Adult incubating in nest #3. |
| Two Bar BA | 0847 | All known nests empty. Failed. |
| Armer Gulch BA | 0855 | No new nests or eagles. |
| Pinto BA | 0906 | Adult incubating in nest #10. |
| Pinal BA | 0908 | All known nests empty. One adult perched, flew. |
| Redmond BA | 0921 | All known nests empty. Pair of adults perched. |
| Cibecue BA | 0933 | All known nests empty. No eagles. |
| Mule Hoof historic BA | 0937 | All known nests empty. No eagles. |
| Cedar Basin BA | 0948 | All known nests empty. No eagles. |
| Carrizo Creek | 0950 | No eagles. One medium to large nest found. |
| Lone Pine BA | 1004 | All known nests empty. No eagles. |

Table 14 continued.

| Location | Time | Comments |
|---|---|---|
| George's Basin BA | 1015 | All known nests empty. One adult perched. |
| Show Low Lake BA | 1130 | Adult appeared to be incubating in nest #1. |
| Water Nest BA | 1145 | All known nests empty. No eagles. |
| Tall Pine nest site | 1148 | All known nests empty. No eagles. |
| Eagle Mountain BA | 1154 | All known nests empty. No eagles. |
| Crescent BA | 1200 | All known nests empty. No eagles. |
| Greer Lakes BA | 1205 | All known nests empty. Pair of adults perched. |
| Becker BA | 1213 | All known nests empty. Two adults in area. |
| Concho BA | 1230 | All known nests empty. Two adults perched. |
| Silver Creek BA | 1245 | One egg in nest #3 with one adult perched nearby. |
| Fool Hollow BA | 1256 | Adult incubating in nest #4. |
| Talkalai BA | 1444 | Adult incubating in nest #10. Second adult flying. |
| San Carlos BA | 1450 | No new nests or eagles. |
| Suicide BA | 1458 | Adult incubating in nest #1. |
| Coolidge BA | 1501 | Adult incubating in nest #5. |
| Granite Basin BA | 1506 | All known nests empty. No eagles. |
| **March 15, 2022** | | |
| Granite Reef BA | 1502 | All known nests empty. One adult flying. One immature perched. |
| Kerr BA | 1506 | All known nests empty. No eagles. |
| Goldfield BA | 1508 | Two nestlings at least 7 weeks old. One adult perched. |
| Bulldog BA | 1512 | One adult with one nestling, 4 weeks old. |
| Blue Point BA | 1515 | Nest empty, failed. |
| Saguaro BA | 1518 | One nestling 4-4.5 weeks old. Two adults perched. |
| Tortilla Creek BA | 1521 | One adult in nest #1 standing with two eggs. |
| Black Cross BA | 1524 | One nestling 4 weeks old. |
| Fish Creek BA | 1527 | Nest empty, failed. |
| Horse Mesa BA | 1531 | Two eggs in nest. Failed, overdue hatch. One adult soaring. |
| **March 16, 2022** | | |
| 76 BA | 0840 | Two nestlings, 4 weeks old. One adult flying. |
| Sheep BA | 0848 | Adult in nest with two nestlings, 2.5 weeks old. |
| Tonto BA | 0851 | All known nests empty. One adult in area. |
| Bachelor Cove BA | 0857 | Adult in nest with two nestlings, 6-7 weeks old. |
| Two Bar BA | 0901 | One unattended egg in nest #1 (second clutch). |
| Campaign Bay BA | 0908 | No new nests or eagles. |
| Pinto BA | 0911 | Adult in nest with one nestling, 2.5 weeks old. |
| Pinal BA | 0913 | Adult sitting in nest #9 in incubation posture. |
| Redmond BA | 0919 | All known nests empty. No eagles. |
| Silver Creek BA | 0958 | Adult in nest #3 appeared to be brooding young. Second adult perched. |
| Fool Hollow BA | 1009 | Two nestlings, 3 weeks old. |
| Cibecue Crossing nest site | 1129 | All known nests empty. No eagles. |
| Cibecue BA | 1140 | Adult incubating in nest #9. |
| Mule Hoof historic BA | 1143 | All known nests empty. No eagles. |
| Cedar Basin BA | 1150 | All known nests empty. No eagles. |
| Lone Pine BA | 1202 | All known nests empty. Two adults one mile downstream. |
| Pineasco Creek BA | 1210 | All known nests empty. No eagles. |
| George's Basin BA | 1215 | All known nests empty. One adult in area. |
| Crescent BA | 1235 | All known nests empty. No eagles. |
| Greer Lakes BA | 1243 | Adult incubating in nest #7. |

Table 14 continued.

| Location | Time | Comments |
|---|---|---|
| Becker BA | 1250 | All known nests empty. No eagles. |
| Eagle Mountain BA | 1305 | All known nests empty. No eagles. |
| Tall Pine BA | 1312 | Adult incubating in nest #1. |
| Water Nest BA | 1315 | All known nests empty. No eagles. |
| Cooley and Boot Lakes | 1325 | No nests or eagles. |
| Show Low BA | 1330 | Adult incubating in nest #1. Second adult perched in nest. |
| Talkalai BA | 1528 | Adult with one nestling, 7-8 weeks old. One unhatched egg in nest. |
| San Carlos BA | 1535 | No new nests or eagles. |
| Suicide BA | 1547 | Nest empty, failed. |
| Coolidge BA | 1550 | Two nestlings, 2-2.5 weeks old. |
| Granite Basin BA | 1556 | All known nests empty. Two adults in area. One flew to nest #2. |
| | | **March 17, 2022** |
| Riverside BA | 0750 | Adult with two nestlings, 6.5-7 weeks old. |
| Orme BA | 0758 | Two nestlings, 3-3.5 weeks old. |
| Rodeo BA | 0800 | Two nestlings, 4.5-5 weeks old. One adult perched. |
| Sycamore BA | 0803 | All known nests empty. One adult in area. |
| Doka BA | 0805 | One nestling, 3.5-4 weeks old. One adult perched. |
| Fort McDowell BA | 0807 | All known nests empty. No eagles. |
| Box Bar BA | 0810 | Adult incubating or brooding. |
| Bartlett BA | 0815 | Two nestlings, 6 weeks old. One adult in area. |
| Yellow Cliffs BA | 0819 | Two adults standing in nest #1. Appeared to be at least one hatchling present. |
| Sheep Creek BA | 0822 | All known nests empty. No eagles. |
| Cliff BA | 0825 | No new nests or eagles. |
| Horseshoe BA | 0830 | Adult appeared to be brooding young. |
| Chalk Mountain nest site | 0833 | All known nests empty. No eagles. |
| Table Mountain BA | 0839 | Adult brooding at least one hatchling. |
| East Verde BA | 0844 | Adult incubating. |
| Coldwater BA | 0852 | All known nests empty. No eagles. |
| Ladders BA | 0857 | Adult standing in nest appeared to be brooding young. |
| Beaver BA | 0911 | At least one nestling, 2.5-3 weeks old. |
| Oak Creek BA | 0918 | Adult in nest appeared to be brooding young. |
| Green River BA | 0920 | Nest empty, failed. |
| Tapco BA | 0923 | All known nests empty. No eagles. |
| Kachina BA | 1024 | Adult incubating in nest #1. |
| Lower Lake Mary BA | 1031 | Adult incubating in nest #5. |
| Ashurst BA | 1035 | All known nests empty. Pair of adults perched in area. |
| Elaine BA | 1044 | Nest empty, failed. |
| White Horse Lake BA | 1055 | All known nests empty. No eagles. |
| Scholz Lake BA | 1102 | Adult incubating in nest #1. |
| Dogtown Lake BA | 1106 | Adult incubating in nest #3. |
| Kaibab Lake BA | 1110 | Adult incubating or brooding ion nest #8. |
| Cataract Lake BA | 1113 | Two nestlings, 2.5-3 weeks old. Two adults perched in area. |
| Perkinsville BA | 1215 | All known nests empty. One adult perched. |
| Granite golden eagle BA | 1224 | All known nests empty. No eagles. |
| Sullivan Lake BA | 1229 | Adult in nest with two nestlings, 3 weeks old. |
| Watson Lake golden eagle BA | 1236 | All known nests empty. No eagles. |
| Lynx BA | 1240 | Nest #7 fallen. One adult perched. |

Table 14 continued.

| Location | Time | Comments |
|---|---|---|
| Pleasant BA | 1259 | All known nests empty. No eagles. |
| Whiskey Spring BA | 1301 | One adult standing in nest #2 with one egg. |
| Cole's Bay BA | 1304 | All known nests empty. No eagles. |
| Rainbow BA | 1320 | One adult perched above nest, empty. |
| Buckeye BA | 1325 | All known nests empty. No eagles. |
| Pee Posh Wetlands BA | 1320 | Adult in nest with two nestlings, 4.5 weeks old. Second adult perched. |
| Garden Lakes BA | 1340 | Three nestlings, 8 weeks old. |
| **April 18, 2022** | | |
| 76 BA | 0800 | Two nestlings, 8.5 weeks old. |
| Sheep BA | 0807 | Two nestlings, 7 weeks old. Two adults perched. |
| Bachelor Cove BA | 0813 | Two nestlings, 11 weeks old. |
| Two Bar BA | 0817 | All known nests empty. Failed. |
| Pinto BA | 0824 | One nestling, 7 weeks old. |
| Pinal BA | 0827 | Adult with one nestling, 3 weeks old. |
| Redmond BA | 0831 | All known nests empty. No eagles. |
| Cherry Creek | 0834 | Searched upstream to end of trees. No nests or eagles. |
| Silver Creek BA | 0918 | One nestling, 5.5 weeks old. One unhatched egg in nest. One adult perched. |
| Fool Hollow Lake BA | 0934 | Two nestlings, 6.5-7 weeks old. |
| Cibecue BA | 1053 | Adult feeding one nestling, 2.5-3 weeks old. |
| Cedar Basin BA | 1102 | All known nests empty. One adult soaring. |
| Lone Pine BA | 1110 | All known nests empty. No eagles. |
| Pineasco Creek nest site | 1120 | All known nests empty. No eagles. |
| George's Basin BA | 1125 | All known nests empty. No eagles. |
| Reservation Lake | 1140 | No new nests or eagles. One osprey flying. |
| Crescent BA | 1150 | All known nests empty. No eagles. |
| Greer Lakes BA | 1158 | One adult in nest with at least one nestling, 2-3 weeks old. |
| Eagle Mountain BA | 1204 | All known nests empty. No eagles. |
| Tall Pine BA | 1212 | Adult incubating. |
| Water Nest BA | 1215 | All known nests empty. No eagles. |
| Show Low Lake BA | 1229 | Adult brooding nestling(s). |
| Horse Mesa BA | 1409 | Nest empty. Failed. |
| Black Cross BA | 1414 | Adult with one nestling, 9 weeks old. |
| Tortilla Creek BA | 1418 | Adult shading at least one nestling, 2 weeks old. |
| Saguaro BA | 1421 | One nestling, 9-9.5 weeks old. |
| Bulldog BA | 1425 | One nestling, 9 weeks old. |
| Goldfield BA | 1429 | Two nestlings, 11-12 weeks old branching from nest. |
| **April 20, 2022** | | |
| Riverside BA | 0747 | Two adults perched. One fledging in area, second fledgling not seen. |
| Orme BA | 0753 | Two nestlings, 8.5 weeks old. |
| Rodeo BA | 0754 | Two nestlings, 9.5-10 weeks old. One adult perched. |
| Doka BA | 0758 | One nestling, 8.5-9 weeks old. |
| Bartlett BA | 0804 | Two nestlings, 11 weeks old. |
| Yellow Cliffs BA | 0807 | Two nestlings, 4.5-5.5 weeks old. One adult in area. |
| Sheep Creek BA | 0809 | All known nests empty. No eagles. |
| Horseshoe BA | 0815 | Nest empty, failed. |
| Chalk Mountain nest site | 0817 | All known nests empty. No eagles. |

Table 14 continued.

| Location | Time | Comments |
|---|---|---|
| Table Mountain BA | 0823 | Two nestlings, 4-4.5 weeks old. |
| East Verde BA | 0827 | Nest empty, failed. |
| Ladders BA | 0834 | Two nestlings, 5-5.5 weeks old. |
| Beaver BA | 0840 | Adult in nest with one nestling, 7-8 weeks old. |
| Oak Creek BA | 0856 | Two nestlings, 7+ weeks old. |
| Ashurst BA | 0915 | All known nests empty. No eagles. |
| Lower Lake Mary BA | 0920 | Adult brooding at least one nestling, 3 weeks old. |
| Elaine BA | 0929 | All known nests empty. No eagles. |
| Kachina BA | 0934 | Adult in nest with one nestling, 3 weeks old. |
| Scholz Lake BA | 1023 | One nestling, 2-2.5 weeks old. One adult perched. |
| Kaibab Lake BA | 1029 | Adult in nest with two nestlings, 5-6 weeks old. |
| Cataract Lake BA | 1031 | Two nestlings, 7.5 weeks old. One adult perched. |
| Santa Fe Reservoir | 1035 | Two new large nests (#1-2) in snags, both with ospreys incubating. |
| Dogtown Lake BA | 1040 | Adult in nest appeared to be brooding a small nestling. Second adult perched. |
| Sunflower Flat nest site | 1046 | No new nests or eagles. |
| White Horse Lake BA | 1048 | New large nest #9 found. Osprey incubating in nest #8. Osprey standing in nest #6. No eagles. |
| JD Dam Lake nest site | 1054 | Nest #1 fallen. No eagles. |
| Mormon Pocket golden eagle BA | 1105 | All known nests empty. No eagles. |
| Perkinsville BA | 1112 | All known nests empty. No eagles. |
| Sullivan Lake BA | 1125 | One adult in nest with two nestlings, 8 weeks old. |
| Rainbow BA | 1349 | All known nests empty. No eagles. |
| Pee Posh Wetlands BA | 1403 | Nest empty. One adult flying. |
| **May 9, 2022** | | |
| Rodeo BA | 0840 | One nestling branching, 12-13 weeks old. |
| Orme BA | 0841 | Two nestlings, 11-11.5 weeks old. |
| Bulldog BA | 0846 | One nestling, 12 weeks old. |
| Saguaro BA | 0848 | Nest empty. Nestling presume fledged. |
| Tortilla Creek BA | 0851 | One adult in nest with two nestlings, 5.5-6 weeks old. One adult in nest. |
| Black Cross BA | 0855 | One adult in nest with one nestling, 12 weeks old. |
| Pinto BA | 0908 | One nestling, 10 weeks old. One adult flying. |
| Pinal BA | 0910 | Adult with one nestling, 6 weeks old. |
| Sheep BA | 0925 | Two nestlings, 9 weeks old. One adult perched by nest. |
| 76 BA | 0932 | Two nestlings, 10.5 weeks old. |
| OW BA | 0949 | All known nests empty. No eagles. |
| Black Canyon Lake | 0955 | No eagles. New large nest in pine tree. |
| Willow Springs Lake nest site | 1004 | One adult bald eagle flying. Ospreys incubating in nests #4-5, 11-12, either #9 or #2, and in two new large nests. Second new large nest found. |
| Woods Canyon Lake BA | 1022 | Two eggs in nest #14. Adult flying. |
| Bear Canyon Lake nest site | 1220 | Osprey incubating in nest #6. Nest #5 partially fallen. No eagles. |
| Chevelon Canyon Lake BA | 1229 | Adult in nest with one nestling, 6+ weeks old. |
| Knoll Lake nest site | 1243 | Osprey incubating in nest #6. Nest #5 not found. No eagles. |
| Oak Creek BA | 1322 | One nestling, 9 weeks old. |
| Beaver BA | 1332 | One nestling, 10-11 weeks old. |
| Ladders BA | 1339 | Two nestlings, 8-8.5 weeks old. |
| Table Mountain BA | 1352 | Two nestlings, 7-7.5 weeks old. |

Table 14 continued.

| Location | Time | Comments |
|---|---|---|
| Yellow Cliffs BA | 1406 | Two nestlings, 8 weeks old. |
| Bartlett BA | 1408 | Two fledglings flying. |
| Doka BA | 1418 | One nestling, 11.5-12 weeks old. One adult flying. |
| **May 18, 2022** | | |
| Kachina BA | 0900 | One nestling, 6-7 weeks old. |
| Lower Lake Mary BA | 0907 | One nestling 6.5 weeks old. One adult perched. |
| Cataract Lake BA | 1614 | One nestling, 11.5- weeks old. |
| Kaibab Lake BA | 1615 | Adult in nest with one nestling, 9.5 weeks old. Second adult perched. |
| Dogtown Lake BA | 1623 | One nestling, 4 weeks old. |
| Scholz Lake BA | 1627 | Adult in nest with two nestlings, 6-6.5 weeks old. |
| **June 13, 2022** | | |
| Pinal BA | 0655 | Nest empty. No eagles. |
| Tremaine BA | 0731 | Two nestlings, 9.5-10.5 weeks old. |

## APPENDIX E: BACHELOR COVE BREEDING AREA SUMMARY

Table 15. Observed human activity and bald eagle behavior, Bachelor Cove BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Vehicle | 220 | 112 | -- | -- | 2 | 7 | -- | 341 | 61.9 |
| OHV | 24 | 27 | -- | -- | 1 | -- | -- | 52 | 9.4 |
| Small plane | 42 | 4 | -- | -- | -- | -- | 1 | 47 | 8.5 |
| Helicopter, Apache | 24 | -- | -- | -- | -- | -- | -- | 24 | 4.4 |
| Hiker | 10 | 4 | 3 | -- | 1 | 2 | -- | 20 | 3.6 |
| Motorcycle | 7 | 8 | -- | -- | -- | -- | -- | 15 | 2.7 |
| Jet | 9 | 1 | -- | -- | -- | -- | -- | 10 | 1.8 |
| Helicopter | 7 | -- | -- | -- | -- | 1 | -- | 8 | 1.5 |
| Nestwatcher | 3 | 4 | -- | -- | 1 | -- | -- | 8 | 1.5 |
| Birder | 3 | 3 | -- | -- | -- | -- | -- | 6 | 1.1 |
| Helicopter, Sheriff | 4 | -- | -- | -- | -- | -- | -- | 4 | 0.7 |
| Agency worker | -- | 4 | -- | -- | -- | -- | -- | 4 | 0.7 |
| Cycler (bicycle) | 3 | -- | -- | -- | -- | -- | -- | 3 | 0.5 |
| Boater | 3 | -- | -- | -- | -- | -- | -- | 3 | 0.5 |
| Camper | 1 | 1 | -- | -- | -- | -- | -- | 2 | 0.4 |
| Military Jet | 2 | -- | -- | -- | -- | -- | -- | 2 | 0.4 |
| Photographer | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.2 |
| Runner | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.2 |
| Total | 364 | 168 | 3 | -- | 5 | 10 | 1 | 551 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 16. Observed forage events and success, Bachelor Cove BA, Arizona, 2022.

| Sex | Fish | | Birds | | Mammals | | Total | |
|---|---|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U | E | S-U |
| Male | 2 | 1-1 | 2 | 0-2 | 2 | 2-0 | 6 | 3-3 |
| Female | 5 | 4-1 | 2 | 0-2 | -- | -- | 7 | 4-3 |
| Unknown | 1 | 1-0 | -- | -- | 1 | 1-0 | 2 | 2-0 |
| Total | 8 | 6-2 | 4 | 0-4 | 3 | 3-0 | 15 | 9-6 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 17. Observed prey types delivered to the nest, Bachelor Cove BA, Arizona, 2022.

| Sex | Fish | Mammals | Birds | Unknown | Total | Percent |
|---|---|---|---|---|---|---|
| Male | 17 | 4 | 2 | 13 | 36 | 46.8 |
| Female | 16 | -- | 1 | 17 | 34 | 44.2 |
| Unknown | 2 | 1 | -- | 4 | 7 | 9.1 |
| Total | 35 | 5 | 3 | 34 | 77 | |
| Percent | 45.5 | 6.5 | 3.9 | 44.2 | | |

Table 18. Observed prey species delivered to the nest, Bachelor Cove BA, Arizona 2022.

| Sex | Fish | | Bird | Mammal | | Total | Percent |
|---|---|---|---|---|---|---|---|
| | CS[1] | SU | WS | DC | RS | | |
| Male | 1 | 1 | 2 | 1 | 1 | 6 | 100 |
| Female | -- | -- | -- | -- | -- | -- | -- |
| Unknown | -- | -- | -- | -- | -- | -- | -- |
| Total | 1 | 1 | 2 | 1 | 1 | 6 | |
| Percent | 16.7 | 16.7 | 33.3 | 16.7 | 16.7 | | |

[1]CS= catfish species, SU=sucker species, WS=waterfowl species, DC=desert cottontail, RS=rabbit species.

Table 19. Bald eagle habitat analysis at the Bachelor Cove BA, Arizona, 2022.

| Lake km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 82.2 | RI | Right | No | 5 | RC | -- |
| 82.4 | SG | Right | No | 7 | RC | -- |
| 82.4 | SG | Right | No | 7 | RC | -- |
| 82.4 | HL | Right | No | 5 | RC | -- |
| 82.5 | PF | Right | No | 6 | RC | -- |
| 82.5 | SG | Right | No | 6 | RC | -- |
| 82.5 | SG | Right | No | 6 | RC | -- |
| 82.6 | SD | Right | No | 8 | RC | -- |
| 82.6 | RH | Right | No | 8 | RC | -- |
| 82.7 | CT | Right | No | 8 | RC | -- |
| 82.7 | CF | Right | No | 8 | RC | -- |
| 82.7 | * | Right | No | 8 | RC | -- |
| 82.8 | HS | Right | No | 7 | RC | -- |
| 83.7 | CF | Right | No | 1 | RC | -- |

[1]Lake kilometer.
[2]CF=cliff face, CT=cliff top, HL=hillside, HS=hard snag (dead, main branches only), PF=pinnacle ledge, RH=rocky hillside, RI=ridge, SD=snag, cottonwood, SG=soft snag (dead, but branches still intact).
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RC=reservoir cove.

Table 20. Bald eagle habitat use at the Bachelor Cove BA, Arizona, 2022.

| Lake km[1] | PH[2,3] | PX | PW | CL | PG | PP | PE | PV | PK | OT | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 81.8 | 29 | -- | -- | -- | -- | -- | 1 | -- | 4 | -- | 34 | 0.3 |
| 81.9 | 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 19 | 0.1 |
| 82.0 | 198 | 4 | -- | -- | -- | -- | -- | -- | -- | 55 | 257 | 2.0 |
| 82.1 | 474 | 416 | 301 | 229 | 83 | 13 | 12 | 2 | -- | -- | 1,530 | 11.7 |
| 82.2 | 3,367 | 104 | 47 | 292 | 12 | -- | -- | 12 | 18 | -- | 3,852 | 29.4 |
| 82.3 | 36 | 403 | -- | -- | 16 | -- | -- | 21 | -- | -- | 476 | 3.6 |
| 82.4 | 30 | 41 | 315 | 1 | 1 | -- | -- | 3 | 3 | -- | 394 | 3.0 |
| 82.5 | 28 | 21 | 9 | -- | 2 | -- | -- | 2 | 3 | -- | 65 | 0.5 |
| 82.6 | 1,660 | 2,716 | 982 | 76 | 243 | 110 | 111 | 45 | 7 | 71 | 6,021 | 46.0 |
| 82.7 | 3 | 31 | 111 | -- | 20 | 14 | -- | -- | 27 | 5 | 211 | 1.6 |
| 82.8 | 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 27 | 0.2 |
| 83.0 | -- | -- | -- | -- | -- | -- | 12 | -- | 11 | -- | 23 | 0.2 |
| 83.7 | 184 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 184 | 1.4 |
| Total | 6,055 | 3,736 | 1,765 | 598 | 377 | 137 | 136 | 85 | 73 | 131 | 13,093 | |
| Percent | 46.2 | 28.5 | 13.5 | 4.6 | 2.9 | 1.0 | 1.0 | 0.6 | 0.6 | 1.0 | | |

[1]Lake kilometer.
[2]Observation time (minutes).
[3]PH=perched hunting, PX=perched, various, PW=perched watching, CL=perched close to mate, PG=perched on ground, PP=perched preening, PE= perched eating, PV= perched vocalizing, PK=perched with prey, OT=other (perched close to fledgling, standing on shore, perched unknown).

## APPENDIX F: BOX BAR BREEDING AREA SUMMARY

Table 21. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Hiker | 347 | 3 | -- | -- | -- | -- | -- | 350 | 61.0 |
| Canoe/Kayak | 56 | -- | -- | -- | -- | -- | -- | 56 | 9.8 |
| Birder | 37 | -- | -- | -- | -- | -- | -- | 37 | 6.4 |
| Fisherman | 23 | -- | -- | -- | -- | -- | -- | 23 | 4.0 |
| Photographer | 21 | -- | -- | -- | -- | -- | -- | 21 | 3.7 |
| Picnicker | 21 | -- | -- | -- | -- | -- | -- | 21 | 3.7 |
| Horse Back Rider | 16 | 2 | -- | -- | -- | -- | -- | 18 | 3.1 |
| Swimmer | 16 | -- | -- | -- | -- | -- | -- | 16 | 2.8 |
| Cycler | 9 | -- | -- | -- | -- | -- | -- | 9 | 1.6 |
| Agency staff | 9 | -- | -- | -- | -- | -- | -- | 9 | 1.6 |
| Camper | 6 | -- | -- | -- | -- | -- | -- | 6 | 1.0 |
| Tuber | 4 | -- | -- | -- | -- | -- | -- | 4 | 0.7 |
| Paddle board | 4 | -- | -- | -- | -- | -- | -- | 4 | 0.7 |
| Total | 569 | 5 | -- | -- | -- | -- | -- | 574 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 22. Observed prey types delivered to the nest, Box Bar BA, Arizona, 2022.

| Sex | Fish | Mammals | Unknown | Total | Percent |
|---|---|---|---|---|---|
| Male | 13 | 2 | 3 | 18 | 100 |
| Female | -- | -- | -- | -- | -- |
| Total | 13 | 2 | 3 | 18 | |
| Percent | 72.2 | 11.1 | 16.7 | | |

Table 23. Observed prey species delivered to the nest, Box Bar BA, Arizona 2022.

| Sex | Fish | Mammal | | Total | Percent |
|---|---|---|---|---|---|
| | TI[1] | DC | GS | | |
| Male | 3 | 1 | 1 | 5 | 100 |
| Female | -- | -- | -- | -- | -- |
| Total | 3 | 1 | 1 | 5 | |
| Percent | 60.0 | 20.0 | 20.0 | | |

[1]TI=tilapia, DC=desert cottontail, GS=ground squirrel species.

Table 24. Bald eagle habitat analysis at the Box Bar BA, Arizona, 2022.

| River km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 24.4 | WI | L | N | 1 | RU | CW |
| 24.9 | UP | R | N | 5 | RU | CW |
| 25.4 | CL | R | N | 3 | RU | CW |
| 25.5 | CL | R | P | 2 | RU | CW |
| 25.8 | CL | R | N | 2 | RU | CW |

[1]River kilometer.
[2]CL=cottonwood large (>20m), UP=utility (electrical) pole, WI=willow tree.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run.
[5]CW=cottonwood grove.

Table 25. Bald eagle habitat use at the Box Bar BA, Arizona, 2022.

| Lake km[1] | PW[2,3] | PP | CL | PD | PV | PH | CO | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| 24.4 | -- | -- | -- | -- | -- | 20 | -- | 20 | 0.4 |
| 24.9 | -- | -- | -- | 30 | -- | -- | -- | 30 | 0.6 |
| 25.4 | 289 | 104 | 3 | -- | 2 | -- | 1 | 399 | 8.1 |
| 25.5 | 3,067 | 81 | 20 | 13 | 18 | -- | 2 | 3,201 | 65.0 |
| 25.8 | 1,099 | 61 | 98 | -- | 1 | -- | 2 | 1,261 | 25.6 |
| 999.9 | -- | -- | -- | -- | 17 | -- | -- | 17 | 0.3 |
| Total | 4,455 | 246 | 121 | 43 | 38 | 20 | 5 | 4,928 | |
| Percent | 90.4 | 5.0 | 2.5 | 0.9 | 0.8 | 0.4 | 0.1 | | |

[1]Lake kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PP=perched preening, CL=perched close to mate, PD=perched drying, PV= perched vocalizing, PH=perched hunting, CO=copulating.

## APPENDIX G: CATARACT BREEDING AREA SUMMARY

Table 26. Observed human activity and bald eagle behavior, Cataract BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Angler | 39 | 6 | -- | -- | -- | -- | -- | 45 | 32.1 |
| Hiker | 32 | 1 | -- | 3 | -- | -- | -- | 36 | 25.7 |
| Photographer | 12 | 4 | -- | -- | -- | -- | -- | 16 | 11.4 |
| Picnicker | 16 | -- | -- | -- | -- | -- | -- | 16 | 11.4 |
| Canoe | 2 | 7 | -- | -- | -- | -- | -- | 9 | 6.4 |
| Boater | 3 | 4 | -- | -- | -- | -- | -- | 7 | 5.0 |
| Observer | -- | -- | 3 | 1 | -- | -- | -- | 4 | 2.9 |
| Biologist | -- | -- | -- | -- | 2 | -- | -- | 2 | 1.4 |
| Helicopter, military | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.7 |
| Aircraft | -- | 1 | -- | -- | -- | -- | -- | 1 | 0.7 |
| Birder | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.7 |
| Motorcycle | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.7 |
| AGFD helicopter | -- | -- | 1 | -- | -- | -- | -- | 1 | 0.7 |
| Total | 107 | 23 | 4 | 4 | 2 | -- | -- | 140 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 27. Observed forage events and success, Cataract BA, Arizona, 2022.

| Sex | Fish | | Total | |
|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U |
| Male | 29 | 19-10 | 29 | 19-10 |
| Female | 18 | 9-9 | 18 | 9-9 |
| Tandem | 1 | 1-0 | 1 | 1-0 |
| Total | 48 | 29-19 | 48 | 29-19 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 28. Observed prey types delivered to the nest, Cataract BA, Arizona, 2022.

| Sex | Fish | Birds | Unknown | Total | Percent |
|---|---|---|---|---|---|
| Male | 35 | 1 | 10 | 46 | 73.0 |
| Female | 9 | 2 | 5 | 16 | 25.4 |
| Unknown | -- | -- | 1 | 1 | 1.6 |
| Total | 44 | 3 | 16 | 63 | |
| Percent | 69.8 | 4.8 | 25.4 | | |

Table 29. Observed prey species delivered to the nest, Cataract BA, Arizona 2022.

| Sex | Fish | | | | Total | Percent |
|---|---|---|---|---|---|---|
| | RT[1] | CC | TS | TT | | |
| Male | 12 | 3 | 2 | -- | 17 | 70.8 |
| Female | 1 | 5 | -- | 1 | 7 | 29.2 |
| Total | 13 | 8 | 2 | 1 | 24 | |
| Percent | 54.2 | 33.3 | 8.3 | 4.2 | | |

[1]RT=rainbow trout, CC=channel catfish, TS=trout species, TT=tiger trout.

Table 30. Bald eagle habitat analysis at the Cataract BA, Arizona, 2022.

| Lake km[1] | Perch Type[2] | Direction | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 0.65 | SC | S | Partial | 1 | RS | CF |
| 1.95 | SC | NE | No | 2 | RS | CF |
| 1.95 | PS | N | Yes | 1 | RS | CF |
| 2.00 | HS | NE | No | 1 | RS | CF |
| 2.00 | SC | NE | No | 3 | RS | CF |

[1]Lake kilometer.
[2]HS=hard snag (main branches only), PS=pine, second growth (10-20m), SC=snag, conifer.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RS=reservoir, main body.
[4]CF=conifer forest.

Table 31. Bald eagle habitat use at the Cataract BA, Arizona, 2022.

| Lake km[1] | PW[2,3] | PR | TCL | PH | PE | PP | PV | PK | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.65 | 56 | -- | -- | 114 | -- | -- | -- | -- | 170 | 2.1 |
| 1.95 | -- | -- | -- | 102 | -- | -- | -- | -- | 102 | 1.3 |
| 2.00 | 5,863 | 813 | 648 | 349 | 34 | 20 | 11 | 9 | 7,747 | 96.6 |
| Total | 5,919 | 813 | 648 | 565 | 34 | 20 | 11 | 9 | 8,019 | |
| Percent | 73.8 | 10.1 | 8.1 | 7.0 | 0.4 | 0.2 | 0.1 | 0.1 | | |

[1]Lake kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PR=perched, reacting, TCL=tandem, perched close together, PH=perched hunting, PE=perched eating, PP=perched preening, PV=perched vocalizing, PK=perched with prey.

## APPENDIX H: CONCHO BREEDING AREA SUMMARY

Table 32. Observed human activity and bald eagle behavior, Concho BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Walkers | 64 | -- | -- | -- | -- | -- | -- | 64 | 43.5 |
| Dog Walkers | 35 | -- | -- | -- | -- | -- | -- | 35 | 23.8 |
| Dogs | 7 | 6 | -- | -- | -- | -- | -- | 13 | 8.8 |
| Fishermen | 10 | -- | -- | -- | -- | -- | -- | 10 | 6.8 |
| Airplanes | 6 | 2 | -- | -- | -- | -- | -- | 8 | 5.4 |
| Helicopters | 3 | 1 | -- | 1 | -- | -- | -- | 5 | 3.4 |
| ATV | -- | 2 | -- | 1 | -- | -- | -- | 3 | 2.0 |
| Birdwatcher | 1 | -- | -- | 1 | -- | -- | -- | 2 | 1.4 |
| Hiker | -- | -- | -- | -- | -- | 1 | -- | 1 | 0.7 |
| Dirt biker | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.7 |
| Photographer | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.7 |
| Fishing Boat | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.7 |
| Horseback Rider | -- | -- | -- | 1 | -- | -- | -- | 1 | 0.7 |
| Rancher | -- | -- | -- | 1 | -- | -- | -- | 1 | 0.7 |
| Drone | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.7 |
| Total | 130 | 11 | -- | 5 | -- | 1 | -- | 147 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 33. Observed forage events and success, Concho BA, Arizona, 2022.

| Sex | Birds | | Fish | | Mammals | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U | E | S-U | E | S-U |
| Male | 25 | 3-22 | 7 | 7-0 | 3 | 3-0 | 5 | 5-0 | 40 | 18-22 |
| Female | 5 | 2-3 | 2 | 2-0 | 1 | 1-0 | 3 | 3-0 | 11 | 8-3 |
| Total | 30 | 5-25 | 9 | 9-0 | 4 | 4-0 | 8 | 8-0 | 51 | 26-25 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 34. Observed prey types delivered to the nest, Concho BA, Arizona, 2022.

| Sex | Birds | Fish | Mammals | Unknown | Total | Percent |
|---|---|---|---|---|---|---|
| Male | 6 | 3 | 4 | 5 | 18 | 54.5 |
| Female | 5 | 5 | 1 | 4 | 15 | 45.5 |
| Total | 11 | 8 | 5 | 9 | 33 | |
| Percent | 33.3 | 24.2 | 15.2 | 27.3 | | |

Table 35. Observed prey species delivered to the nest, Concho BA, Arizona 2022.

| Sex | Birds | Mammals | Fish | | Total | Percent |
|---|---|---|---|---|---|---|
| | AC[1] | PD | CP | CS | | |
| Male | 6 | 3 | 1 | -- | 10 | 58.8 |
| Female | 5 | 1 | -- | 1 | 7 | 41.2 |
| Total | 11 | 4 | 1 | 1 | 17 | |
| Percent | 64.7 | 23.5 | 5.9 | 5.9 | | |

[1] AC=American coot, PD=prairie dog, CP=common carp, CS=catfish species.

Table 36. Bald eagle habitat analysis at the Concho BA, Arizona, 2022.

| Lake km[1] | Perch Type[2] | Shade | Distance to $H_2O$[3] | Water Type[4] | Land Type[5] |
|---|---|---|---|---|---|
| 0.1 | SO | No | 1 | RS | SO |
| 0.1 | JN | No | 1 | RS | CF |
| 0.2 | SO | No | 1 | RS | SO |
| 0.4 | JN | No | 2 | RS | CF |
| 0.4 | SO | No | 1 | RS | SO |
| 0.5 | SJ | No | 1 | RS | CF |
| 0.6 | SO | No | 1 | RS | SO |
| 0.8 | SO | No | 1 | RS | SO |
| 0.8 | JN | No | 3 | RS | CF |
| 0.9 | SJ | No | 3 | RS | CF |
| 0.9 | JN | No | 2 | RS | CF |
| 1.0 | SJ | No | 2 | RS | CF |
| 1.0 | SO | No | 1 | RS | SO |
| 1.1 | SJ | No | 3 | RS | CF |
| 1.1 | SO | No | 1 | RS | SO |
| 1.2 | SJ | No | 3 | RS | CF |
| 1.3 | CL | Yes | 1 | RS | CW |
| 1.3 | CL | Yes | 1 | RS | CW |
| 1.3 | JN | No | 3 | RS | CF |
| 1.3 | FP | No | 1 | RS | SO |
| 1.3 | HL | Partial | 1 | RS | CF |
| 1.4 | CL | Yes | 1 | RS | CW |
| 1.4 | SO | Partial | 1 | RS | SO |
| 1.4 | CL | Partial | 1 | RS | CW |
| 1.5 | CL | Partial | 2 | RS | CW |
| 1.5 | CL | Partial | 1 | RS | CW |
| 1.5 | SO | Partial | 1 | RS | SO |
| 1.6 | CL | Yes | 2 | IF | CW |
| 1.6 | SO | Partial | 1 | RS | SO |
| 1.8 | CL | Yes | 2 | IF | CW |
| 2.2 | CL | Partial | 2 | RS | CW |
| 2.2 | SO | No | 1 | RS | SO |
| 2.3 | SO | No | 1 | RS | SO |
| 2.9 | SO | No | 1 | RS | SO |
| 3.1 | BO | No | 1 | RS | SO |

[1]Lake kilometer.
[2]BO=boulder, CL=cottonwood large (20-30m), FP=fence post, HL=hillside, JN=live juniper, SJ=snag juniper, SO=shore.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]IF=Inflow to reservoir, RS=reservoir main body.
[5]CF=conifer forest, CW=cottonwood grove, SO=shore.

Table 37. Bald eagle habitat use at the Concho BA, Arizona, 2022.

| Lake km[1] | PW[2,3] | SS | CL | SH | PP | PD | ES | PH | DW | OT | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1 | 127 | 65 | 4 | -- | -- | -- | -- | 55 | -- | -- | 251 | 0.6 |
| 0.2 | 11 | 39 | -- | 7 | -- | -- | 18 | -- | -- | -- | 75 | 0.2 |
| 0.4 | 81 | 191 | 7 | 51 | -- | -- | 12 | 2 | -- | -- | 344 | 0.8 |
| 0.5 | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17 | <0.1 |
| 0.6 | 21 | 288 | -- | 53 | -- | -- | 18 | -- | 3 | 12 | 395 | 0.9 |
| 0.8 | 62 | 108 | -- | 10 | -- | -- | -- | 6 | 2 | 3 | 191 | 0.5 |
| 0.9 | 130 | -- | -- | 21 | -- | -- | 19 | -- | -- | -- | 170 | 0.4 |
| 1.0 | 114 | 38 | 6 | 29 | -- | 37 | 8 | -- | -- | 5 | 237 | 0.6 |
| 1.1 | 940 | 244 | -- | 458 | -- | -- | 38 | -- | 75 | 106 | 1,861 | 4.4 |
| 1.2 | 1,197 | -- | 35 | -- | 73 | -- | -- | -- | -- | 4 | 1,309 | 3.1 |
| 1.3 | 796 | -- | -- | -- | 11 | -- | -- | 3 | -- | 38 | 848 | 2.0 |
| 1.4 | 21,564 | 6 | 537 | -- | 124 | 50 | -- | -- | 3 | 7 | 22,291 | 52.6 |
| 1.5 | 12,975 | 44 | 361 | 26 | 411 | 41 | 8 | 25 | 6 | 77 | 13,974 | 33.0 |
| 1.6 | 159 | 19 | -- | -- | -- | -- | -- | -- | 3 | 64 | 245 | 0.6 |
| 1.8 | 85 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 85 | 0.2 |
| 2.2 | 10 | 10 | -- | -- | -- | -- | -- | -- | 3 | 9 | 32 | 0.1 |
| 2.3 | -- | 6 | 2 | -- | -- | -- | -- | -- | 3 | -- | 11 | <0.1 |
| 2.9 | 18 | 5 | -- | -- | -- | -- | -- | -- | -- | -- | 23 | 0.1 |
| 3.1 | -- | -- | -- | -- | -- | -- | -- | 18 | -- | -- | 18 | <0.1 |
| Total | 38,307 | 1,063 | 952 | 655 | 619 | 128 | 121 | 109 | 98 | 325 | 42,377 | |
| Percent | 90.4 | 2.5 | 2.2 | 1.5 | 1.5 | 0.3 | 0.3 | 0.3 | 0.2 | 0.8 | | |

[1]Lake kilometer.

[2]Observation time (minutes).

[3]PW=perched watching, SS=standing on shore, CL=perched close to mate, SH=standing in water, PP=perched preening, PD=perched drying, ES=eating on shore, PH=perched hunting, DW=drinking water, OT=other (perched eating, bathing, perched unknown, perched with prey, perched on ground, perched vocalizing, gathering nest materials, perched various/other, copulation).

## APPENDIX I: GOLDFIELD BREEDING AREA SUMMARY

Table 38. Observed human activity and bald eagle behavior, Goldfield BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Unspecified Visitor | 2,125 | -- | -- | -- | -- | 533 | -- | 2,658 | 17.6 |
| Paddleboard | 842 | -- | -- | 2 | -- | 1,794 | -- | 2,638 | 17.4 |
| Canoe/Kayak | 612 | -- | -- | -- | -- | 1,424 | -- | 2,036 | 13.4 |
| Jet | 1,027 | 1 | -- | -- | -- | 445 | -- | 1,473 | 9.7 |
| Hiker | 1,055 | -- | -- | -- | -- | 366 | -- | 1,421 | 9.4 |
| Picnicker | 411 | -- | -- | -- | -- | 729 | -- | 1,140 | 7.5 |
| Tuber | 323 | -- | -- | -- | -- | 554 | -- | 877 | 5.8 |
| Horseback Rider | 678 | -- | -- | -- | -- | 186 | -- | 864 | 5.7 |
| Dog | 319 | -- | -- | -- | -- | 194 | -- | 513 | 3.4 |
| Photographer | 255 | 4 | -- | -- | -- | 164 | -- | 423 | 2.8 |
| Small plane | 247 | 1 | -- | -- | -- | 89 | 1 | 338 | 2.2 |
| Angler | 145 | -- | -- | -- | -- | 70 | -- | 215 | 1.4 |
| Birder | 134 | -- | -- | -- | -- | 41 | -- | 175 | 1.2 |
| Helicopter | 46 | 10 | 1 | -- | -- | 30 | 5 | 92 | 0.6 |
| Motorcycle | 82 | -- | -- | -- | -- | 8 | -- | 90 | 0.6 |
| Bicycle | 36 | -- | -- | -- | -- | 21 | -- | 57 | 0.4 |
| Drone | 24 | -- | -- | -- | -- | -- | -- | 24 | 0.2 |
| Metal Detector | 15 | -- | -- | -- | -- | -- | -- | 15 | 0.1 |
| Agency Employee | 7 | -- | -- | -- | -- | 6 | -- | 13 | 0.1 |
| Apache Helicopter | 3 | 1 | -- | -- | -- | 6 | 1 | 11 | 0.1 |
| OHV | 6 | -- | -- | -- | -- | 2 | 1 | 9 | 0.1 |
| Swimmer | 1 | -- | -- | -- | -- | 8 | -- | 9 | 0.1 |
| Motorized Parachute | 5 | 2 | -- | -- | -- | -- | 1 | 8 | 0.1 |
| Helicopter, Sheriff | 4 | 1 | -- | -- | -- | 1 | 2 | 8 | 0.1 |
| Military Helicopter | 2 | -- | -- | -- | -- | 5 | -- | 7 | <0.1 |
| Driver | 4 | 2 | -- | -- | -- | -- | -- | 6 | <0.1 |
| Camper | 5 | -- | -- | -- | -- | -- | -- | 5 | <0.1 |
| Military Jet | 5 | -- | -- | -- | -- | -- | -- | 5 | <0.1 |
| Shooter | 3 | -- | -- | -- | -- | -- | -- | 3 | <0.1 |
| Gunshot | 1 | -- | -- | -- | -- | -- | -- | 1 | <0.1 |
| Nestwatcher | -- | -- | -- | 1 | -- | -- | -- | 1 | <0.1 |
| Runner | 1 | -- | -- | -- | -- | -- | -- | 1 | <0.1 |
| Boater | 1 | -- | -- | -- | -- | -- | -- | 1 | <0.1 |
| Airboat | -- | -- | -- | -- | -- | 1 | -- | 1 | <0.1 |
| Sonic Boom | -- | 1 | -- | -- | -- | -- | -- | 1 | <0.1 |
| Total | 8,424 | 23 | 1 | 3 | -- | 6,677 | 11 | 15,139 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 39. Observed forage events and success, Goldfield BA, Arizona, 2022.

| Sex | Birds | | Fish | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U | E | S-U |
| Male | 1 | 1-0 | -- | -- | -- | -- | 1 | 1-0 |
| Female | -- | -- | -- | -- | 1 | 0-1 | 1 | 0-1 |
| Unknown | -- | -- | 1 | 1-0 | 2 | 1-1 | 3 | 2-1 |
| Total | 1 | 1-0 | 1 | 1-0 | 3 | 1-2 | 5 | 3-2 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

| Table 40. Observed prey types delivered to the nest, Goldfield BA, Arizona, 2022. | | | | | | |
|---|---|---|---|---|---|---|
| Sex | Fish | Birds | Mammals | Unknown | Total | Percent |
| Male | 6 | 3 | 1 | 15 | 25 | 30.5 |
| Female | 7 | 3 | -- | 26 | 36 | 43.9 |
| Unknown | 6 | 1 | -- | 14 | 21 | 25.6 |
| Total | 19 | 7 | 1 | 55 | 82 | |
| Percent | 23.2 | 8.5 | 1.2 | 67.1 | | |

| Table 41. Bald eagle habitat analysis at the Goldfield BA, Arizona, 2022. | | | | | | |
|---|---|---|---|---|---|---|
| River km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
| 8.8 | SD | Right | No | 1 | RU | TX |
| 8.8 | DM | Right | Partial | 5 | RB | TX |
| 8.9 | CS | Right | Partial | 6 | RU | TX |
| 9.1 | SG | Right | No | 4 | BW | WT |
| 9.1 | CS | Right | Partial | 4 | BW | MB |
| 9.2 | SG | Right | No | 4 | BW | MB |
| 9.3 | CS | Right | Partial | 4 | BW | MB |
| 9.3 | SG | Right | No | 5 | BW | WT |
| 9.3 | ST | Right | No | 1 | RB | SO |
| 9.4 | CS | Right | No | 4 | BW | MB |
| 9.4 | ST | Right | No | 1 | RB | SO |
| 9.5 | HS | Right | No | 4 | BW | MB |
| 9.7 | HS | Right | No | 4 | RU | TX |
| 9.8 | CL | Right | Partial | 1 | RB | WT |
| 9.8 | SS | Right | No | 1 | RU | SO |
| 9.9 | CL | Left | Partial | 1 | RU | MB |
| 10.0 | CM | Right | No | 1 | RU | TX |
| 10.1 | HS | Right | No | 1 | RU | TX |
| 10.1 | MS | Left | Partial | 1 | RU | MB |
| 10.2 | CL | Left | Partial | 1 | RU | SO |
| 10.3 | SD | Right | No | 4 | BW | TX |
| 10.5 | SP | Right | No | 3 | RB | WT |
| 10.7 | SO | Left | No | 1 | RU | SO |
| 10.7 | CT | Right | No | 1 | RB | CL |
| 10.8 | CT | Right | No | 1 | RB | CL |
| 11.1 | CS | Right | Partial | 1 | RU | SO |
| 11.3 | SB | Island | No | 1 | RU | GB |
| 11.3 | BO | Right | No | 1 | RB | UP |

[1]River kilometer.
[2]BO=boulder, CL=cottonwood large/20-30m, cottonwood medium/10-20m, CS=cottonwood small/0-10m, CT=cliff top, DM=deciduous medium/5-10m, HS=hard snag, MS=mesquite, SB=sand bar, SD=cottonwood snag, SG=soft snag, SO=shore, SP=stump/fallen tree, SS=soft snag, ST=snag top.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]BW=backwater, RB=river bend, RU=run.
[5]CL=cliff, GB=gravel bar, MB=mesquite bosque, SO=shore, TX=tamarisk thicket, UP=desert upland, WT=willow thicket.

Table 42. Bald eagle habitat use at the Goldfield BA, Arizona, 2022.

| River km[1] | PW[2,3] | PD | PU | PP | PH | PV | SS | SH | DW | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.8 | 1,217 | -- | 79 | 15 | -- | 2 | -- | -- | -- | 1,313 | 18.7 |
| 9.1 | 153 | -- | 63 | -- | -- | -- | -- | -- | -- | 216 | 3.1 |
| 9.2 | 5 | -- | -- | -- | -- | -- | -- | -- | -- | 5 | 0.1 |
| 9.3 | 352 | 3 | -- | 8 | 18 | 3 | -- | -- | -- | 384 | 5.5 |
| 9.4 | 518 | 14 | 80 | 25 | -- | 5 | -- | -- | -- | 642 | 9.2 |
| 9.5 | 116 | -- | -- | -- | -- | -- | -- | -- | -- | 116 | 1.7 |
| 9.6 | -- | -- | -- | -- | -- | -- | -- | 3 | -- | 3 | <0.1 |
| 9.7 | 3 | -- | -- | -- | -- | -- | -- | -- | -- | 3 | <0.1 |
| 9.8 | 663 | -- | -- | -- | -- | -- | -- | -- | -- | 663 | 9.5 |
| 9.9 | 1,250 | -- | 99 | 5 | -- | 2 | -- | -- | -- | 1,356 | 19.3 |
| 10.0 | -- | -- | 1 | -- | -- | -- | -- | -- | -- | 1 | <0.1 |
| 10.1 | 360 | 309 | -- | -- | -- | -- | -- | -- | -- | 669 | 9.5 |
| 10.2 | 2 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | <0.1 |
| 10.3 | 761 | -- | -- | 68 | -- | 1 | -- | -- | -- | 830 | 11.8 |
| 10.5 | 498 | -- | -- | -- | -- | -- | -- | -- | -- | 498 | 7.1 |
| 10.6 | 26 | -- | -- | -- | -- | -- | -- | -- | -- | 26 | 0.4 |
| 10.7 | 250 | -- | -- | 6 | -- | 3 | 3 | -- | 2 | 264 | 3.8 |
| 10.8 | 2 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | <0.1 |
| 11.1 | 6 | -- | -- | -- | -- | -- | -- | -- | -- | 6 | 0.1 |
| 11.3 | 11 | -- | -- | -- | -- | 1 | 2 | -- | -- | 14 | 0.2 |
| Total | 6,193 | 326 | 322 | 127 | 18 | 17 | 5 | 3 | 2 | 7,013 | |
| Percent | 88.3 | 4.6 | 4.6 | 1.8 | 0.3 | 0.2 | 0.1 | <0.1 | <0.1 | | |

[1]River kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PD= perched drying, PU=perched unknown, PP=perched preening, PH=perched hunting, PV= perched vocalizing, SS=standing on shore, SH=standing in water, DW=drinking water.

## APPENDIX J: GREER LAKES BREEDING AREA SUMMARY

Table 43. Observed human activity and bald eagle behavior, Greer Lakes BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Driver | 20 | -- | -- | -- | -- | -- | -- | 20 | 47.6 |
| OHV | 12 | -- | -- | -- | -- | -- | -- | 12 | 28.6 |
| Photographer | 2 | -- | -- | -- | 3 | -- | -- | 5 | 11.9 |
| Hiker | 2 | -- | -- | 1 | -- | -- | -- | 3 | 7.1 |
| Birder | 2 | -- | -- | -- | -- | -- | -- | 2 | 4.8 |
| Total | 38 | -- | -- | 1 | 3 | -- | -- | 42 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 44. Observed forage events and success, Greer Lakes BA, Arizona, 2022.

| Sex | Fish | | Birds | | Total | |
|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U |
| Male | 21 | 21-0 | 1 | 1-0 | 22 | 22-0 |
| Female | 17 | 17-0 | 1 | 1-0 | 18 | 18-0 |
| Total | 38 | 38-0 | 2 | 2-0 | 40 | 40-0 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 45. Observed prey types delivered to the nest, Greer Lakes BA, Arizona, 2022.

| Sex | Fish | Birds | Total | Percent |
|---|---|---|---|---|
| Male | 21 | 1 | 22 | 56.4 |
| Female | 16 | 1 | 17 | 43.6 |
| Total | 37 | 2 | 39 | |
| Percent | 94.9 | 5.1 | | |

Table 46. Bald eagle habitat analysis at the Greer Lakes BA, Arizona, 2022.

| Lake km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 1.1 | PS | -- | Yes | 3 | RC | -- |
| 1.2 | HS | -- | No | 6 | RS | -- |
| 1.3 | PO | -- | Yes | 3 | RS | -- |
| 1.4 | PO | -- | Partial | 5 | RS | -- |
| 1.4 | PO | -- | Partial | 5 | RS | -- |
| 1.4 | PO | -- | Partial | 5 | RS | -- |
| 1.4 | PO | -- | Partial | 5 | RS | -- |
| 1.5 | PO | -- | Yes | 5 | RS | -- |
| 1.6 | PO | -- | Yes | 3 | RS | -- |
| 1.7 | PO | -- | Yes | 3 | RS | -- |
| 1.8 | PO | -- | Yes | 3 | RS | -- |
| 1.9 | HS | -- | Yes | 2 | IF | -- |
| 2.6 | SC | -- | No | 3 | IF | -- |

[1]Lake kilometer.
[2]HS=hard snag, PO=ponderosa pine, PS=pine/conifer, second growth/10-20m, SC=snag, conifer.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]IF=inflow to reservoir, RC=reservoir cove, RS=reservoir main body.

Table 47. Bald eagle habitat use at the Greer Lakes BA, Arizona, 2022.

| Lake km[1] | PW[2,3] | PR | CL | PV | PP | ET | Total | Percent |
|---|---|---|---|---|---|---|---|---|
| 1.1 | 2,043 | 352 | -- | 10 | -- | -- | 2,405 | 9.3 |
| 1.2 | 339 | -- | -- | 8 | -- | -- | 347 | 1.3 |
| 1.3 | 555 | -- | -- | 4 | -- | -- | 559 | 2.2 |
| 1.4 | 16,364 | 1,738 | 332 | 38 | 32 | 13 | 18,517 | 71.9 |
| 1.5 | 868 | 79 | -- | 4 | -- | -- | 951 | 3.7 |
| 1.6 | 302 | -- | -- | 2 | -- | -- | 304 | 1.2 |
| 1.7 | 705 | -- | -- | 3 | -- | -- | 708 | 2.7 |
| 1.8 | 308 | 308 | -- | 18 | -- | -- | 634 | 2.5 |
| 1.9 | 889 | 187 | -- | -- | -- | -- | 1,076 | 4.2 |
| 2.6 | 264 | -- | -- | -- | -- | -- | 264 | 1.0 |
| Total | 22,637 | 2,664 | 332 | 87 | 32 | 13 | 25,765 | |
| Percent | 87.9 | 10.3 | 1.3 | 0.3 | 0.1 | 0.1 | | |

[1]Lake kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PR=perched roosting, CL=perched close to mate, PV= perched vocalizing, PP=perched preening, ET=eating in tree.

## APPENDIX K: LUNA BREEDING AREA SUMMARY

| Table 48. Observed human activity and bald eagle behavior, Luna BA, Arizona, 2022. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
| Angler | 166 | -- | -- | -- | -- | -- | -- | 166 | 58.2 |
| Driver | 42 | -- | -- | -- | -- | -- | -- | 42 | 14.7 |
| Birder | 30 | -- | -- | -- | -- | -- | -- | 30 | 10.5 |
| Boater (fishing) | 15 | -- | -- | -- | -- | -- | -- | 15 | 5.3 |
| Hiker | 11 | -- | -- | -- | -- | -- | -- | 11 | 3.9 |
| Kayak/canoe | 7 | -- | -- | -- | -- | -- | -- | 7 | 2.5 |
| U.S. Forest Service | 5 | -- | -- | -- | -- | -- | -- | 5 | 1.8 |
| Biologist | 5 | -- | -- | -- | -- | -- | -- | 5 | 1.8 |
| Float tuber (fishing) | 2 | -- | -- | -- | -- | -- | -- | 2 | 0.7 |
| Photographer | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.4 |
| Dog | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.4 |
| Total | 285 | -- | -- | -- | -- | -- | -- | 285 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

| Table 49. Observed forage events and success, Luna BA, Arizona, 2022. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sex | Birds | | Fish | | Carrion | | Total | |
| | E[1] | S-U[2] | E | S-U | E | S-U | E | S-U |
| Male | 26 | 26-0 | 8 | 8-0 | -- | -- | 34 | 34-0 |
| Female | 12 | 12-0 | 10 | 10-0 | 2 | 2-0 | 24 | 24-0 |
| Total | 38 | 38-0 | 18 | 18-0 | 2 | 2-0 | 58 | 58-0 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

| Table 50. Observed prey types delivered to the nest, Luna BA, Arizona, 2022. | | | | |
|---|---|---|---|---|
| Sex | Birds | Fish | Total | Percent |
| Male | 25 | 9 | 34 | 61.8 |
| Female | 12 | 9 | 21 | 38.2 |
| Total | 37 | 18 | 55 | |
| Percent | 67.3 | 32.7 | | |

| Table 51. Observed prey species delivered to the nest, Luna BA, Arizona 2022. | | | | | |
|---|---|---|---|---|---|
| Sex | Birds | Fish | | Total | Percent |
| | AC[1] | RT | CT | | |
| Male | 25 | 8 | 1 | 34 | 61.8 |
| Female | 12 | 9 | -- | 21 | 38.2 |
| Total | 37 | 17 | 1 | 55 | |
| Percent | 67.3 | 30.9 | 1.8 | | |

[1]AC=American coot, RT=rainbow trout, CT=cutthroat trout.

Table 52. Bald eagle habitat analysis at the Luna BA, Arizona, 2022.

| Lake km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 0.1 | PS | -- | No | 1 | RS | -- |
| 0.7 | HS | -- | No | 2 | RC | -- |
| 1.4 | PO | -- | Yes | 2 | RS | -- |
| 2.2 | SH | -- | No | 7 | -- | CF |
| 2.3 | PO | -- | Yes | 7 | -- | CF |
| 2.3 | PO | -- | Partial | 7 | -- | CF |
| 2.4 | HS | -- | No | 7 | -- | CF |
| 2.4 | PS | -- | Yes | 7 | -- | CF |
| 2.6 | WF | -- | No | 1 | RS | -- |
| 2.6 | SC | -- | No | 6 | -- | CF |
| 2.7 | PS | -- | Yes | 2 | RS | -- |
| 2.8 | PS | -- | Yes | 2 | -- | CF |
| 4.5 | FP | -- | No | 1 | RC | -- |
| 5.1 | FP | -- | No | 2 | RC | -- |
| 5.1 | RW | -- | No | 1 | RC | -- |
| 5.3 | RO | -- | No | 1 | RC | -- |

[1]Lake kilometer.
[2]FP=fence post, HS=hard snag, PO=old growth pine (20-30m+), PS=small pine (10-20m), RO=rock, RW=rock in water, SC=snag conifer, SH=shrub, WF=waterfowl sign.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RC=reservoir cove, RS=reservoir main body.
[5]CF=conifer forest.

Table 53. Bald eagle habitat use at the Luna BA, Arizona, 2022.

| Lake km[1] | PW[2,3] | PR | PP | PH | PV | Total | Percent |
|---|---|---|---|---|---|---|---|
| 0.1 | -- | -- | -- | 60 | -- | 60 | 0.4 |
| 0.7 | 436 | -- | -- | 85 | -- | 521 | 3.7 |
| 1.4 | 21 | -- | -- | -- | -- | 21 | 0.1 |
| 2.2 | 646 | -- | -- | -- | -- | 646 | 4.5 |
| 2.3 | 568 | 853 | -- | -- | -- | 1,421 | 10.0 |
| 2.4 | 7,399 | 2,632 | 473 | -- | 7 | 10,511 | 74.0 |
| 2.6 | 129 | -- | -- | -- | -- | 129 | 0.9 |
| 2.7 | 513 | -- | -- | 122 | -- | 635 | 4.5 |
| 2.8 | 150 | -- | -- | 30 | -- | 180 | 1.3 |
| 4.4 | -- | -- | -- | 17 | -- | 17 | 0.1 |
| 5.1 | 12 | -- | -- | 48 | -- | 60 | 0.4 |
| 5.3 | 10 | -- | -- | -- | -- | 10 | 0.1 |
| Total | 9,884 | 3,485 | 473 | 362 | 7 | 14,211 | |
| Percent | 69.6 | 24.5 | 3.3 | 2.5 | <0.1 | | |

[1]Lake kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PR=perched roosting, PP=perched preening, PH=perched hunting, PV=perched vocalizing.

## APPENDIX L: ORME BREEDING AREA SUMMARY

Table 54. Observed human activity and bald eagle behavior, Orme BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Helicopter | 86 | 40 | 1 | 1 | -- | 53 | 1 | 182 | 52.9 |
| Small plane | 52 | 6 | -- | -- | -- | 1 | -- | 59 | 17.2 |
| Driver | 2 | 11 | -- | -- | -- | 13 | -- | 26 | 7.6 |
| Helicopter, Apache | 13 | 2 | -- | -- | -- | 8 | -- | 23 | 6.7 |
| Horseback rider | -- | 2 | -- | 11 | -- | -- | -- | 13 | 3.8 |
| Cyclists | -- | 12 | -- | -- | -- | -- | -- | 12 | 3.5 |
| Helicopter, other Military | 7 | -- | -- | -- | -- | 4 | -- | 11 | 3.2 |
| Hiker | -- | 4 | -- | -- | -- | 3 | -- | 7 | 2.0 |
| Angler | 4 | -- | -- | -- | -- | -- | -- | 4 | 1.2 |
| Helicopter, Sheriff | -- | -- | -- | -- | -- | 4 | -- | 4 | 1.2 |
| AGFD biologist | -- | 1 | -- | 2 | -- | -- | -- | 3 | 0.9 |
| Total | 164 | 78 | 1 | 14 | -- | 86 | 1 | 344 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 55. Observed forage events and success, Orme BA, Arizona, 2022.

| Sex | Fish | | Mammals | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U | E | S-U |
| Male | -- | -- | -- | -- | -- | -- | -- | -- |
| Female | 2 | 1-1 | 1 | 1-0 | 1 | 0-1 | 4 | 2-2 |
| Total | 2 | 1-1 | 1 | 1-0 | 1 | 0-1 | 4 | 2-2 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 56. Observed prey types delivered to the nest, Orme BA, Arizona, 2022.

| Sex | Fish | Birds | Mammals | Carrion | Total | Percent |
|---|---|---|---|---|---|---|
| Male | 11 | 10 | 3 | 8 | 32 | 60.4 |
| Female | 7 | 8 | 3 | 1 | 19 | 35.8 |
| Tandem | -- | -- | -- | 1 | 1 | 1.9 |
| Unknown | 1 | -- | -- | -- | 1 | 1.9 |
| Total | 19 | 18 | 6 | 10 | 53 | |
| Percent | 35.8 | 34.0 | 11.3 | 18.9 | | |

Table 57. Bald eagle habitat analysis at the Orme BA, Arizona, 2022.

| River km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 0.2 | UP | R | N | 6 | -- | UP |
| 0.3 | UP | R | N | 7 | -- | UP |
| 0.4 | UP | R | N | 7 | -- | UP |
| 0.4 | SS | R | N | 4 | RU | CW |
| 0.6 | SS | R | N | 5 | RU | UP |
| 0.6 | HS | L | N | 2 | RU | CW |
| 0.7 | CL | R | P | 1 | RU | CW |
| 0.7 | UP | R | N | 7 | -- | UP |
| 0.7 | NE | R | P | 4 | RU | CW |
| 0.8 | UP | R | N | 7 | -- | UP |
| 0.8 | MS | R | N | 1 | RU | CW |
| 0.8 | BO | R | N | 1 | RU | SB |
| 0.8 | HS | R | N | 1 | RU | CW |

[1]River kilometer (V=Verde River).
[2]BO=boulder, CL=cottonwood large (20-30m), HS=hard snag, MS=mesquite tree, NE=nest, SS=soft snag, UP=utility pole.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run.
[5]CW=cottonwood grove, SB=sand bar, UP=desert upland.

Table 58. Bald eagle habitat use at the Orme BA, Arizona, 2022.

| River km[1] | PW[2,3] | PP | PU | PH | CL | PV | PX | PE | PK | OT | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1 | 126 | 28 | -- | -- | -- | -- | -- | -- | -- | -- | 154 | 2.0 |
| 0.2 | 61 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 61 | 0.8 |
| 0.3 | 45 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45 | 0.6 |
| 0.4 | 192 | 6 | -- | -- | -- | 17 | -- | -- | 7 | -- | 222 | 2.9 |
| 0.5 | 47 | 30 | -- | -- | -- | -- | -- | 4 | -- | -- | 81 | 1.0 |
| 0.6 | 3,548 | 1,699 | -- | 164 | 128 | 79 | 54 | 23 | -- | 9 | 5,704 | 73.8 |
| 0.7 | 463 | 227 | 151 | 43 | 2 | 25 | 27 | -- | 9 | -- | 947 | 12.2 |
| 0.8 | 83 | -- | 179 | 100 | -- | -- | -- | 19 | -- | 12 | 393 | 5.1 |
| 0.9 | 42 | 75 | -- | 7 | -- | -- | -- | -- | -- | -- | 124 | 1.6 |
| Total | 4,607 | 2,065 | 330 | 314 | 130 | 121 | 81 | 46 | 16 | 21 | 7,731 | |
| Percent | 59.6 | 26.7 | 4.3 | 4.1 | 1.7 | 1.6 | 1.0 | 0.6 | 0.2 | 0.3 | | |

[1]River kilometer (Verde River).
[2]Observation time (minutes).
[3]PW=perched watching, PP=perched preening, PU=perched unknown, PH=perched hunting, CL=perched close to mate, PV=perched vocalizing, PX=perched various, PE=perched eating, PK=perched with prey, OT=other.

## APPENDIX M: PLEASANT BREEDING AREA SUMMARY

Table 59. Observed human activity and bald eagle behavior, Pleasant BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Boat | 7 | -- | -- | -- | -- | 4 | -- | 11 | 37.9 |
| Small plane | 4 | 2 | -- | -- | -- | 1 | -- | 7 | 24.1 |
| Helicopter | 3 | 2 | -- | -- | -- | -- | -- | 5 | 17.2 |
| Military jet | -- | 2 | 1 | -- | -- | 1 | -- | 4 | 13.8 |
| Large plane | 1 | -- | -- | -- | -- | -- | -- | 1 | 3.4 |
| Military helicopter | -- | 1 | -- | -- | -- | -- | -- | 1 | 3.4 |
| Total | 15 | 7 | 1 | -- | -- | 6 | -- | 29 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 60. Observed prey types delivered to the nest, Pleasant BA, Arizona, 2022.

| Sex | Fish | Total | Percent |
|---|---|---|---|
| Male | 1 | 1 | 25.0 |
| Female | 3 | 3 | 75.0 |
| Total | 4 | 4 | |
| Percent | 100 | | |

Table 61. Bald eagle habitat analysis at the Pleasant BA, Arizona, 2022.

| River km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 73.1 | HL | Left | Partial | 0 | IF | UP |
| 73.3 | CT | Left | No | 2 | IF | CL |
| 73.4 | CT | Left | No | 2 | IF | CL |
| 73.4 | CF | Left | Partial | 2 | IF | CL |
| 73.5 | CF | Left | Partial | 3 | IF | CL |
| 73.5 | BO | Left | No | 1 | IF | UP |
| 75.6 | CT | Right | No | 1 | IF | CL |

[1]River kilometer.
[2]BO=boulder, CF=cliff ledge, CT=cliff top, HL=hillside.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]IF=inflow of lake.
[5]CL=cliff, UP=desert upland.

Table 62. Bald eagle habitat use at the Pleasant BA, Arizona, 2022.

| River km[1] | PW[2,3] | PR | PU | PP | PE | PV | PK | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| 73.3 | 175 | 83 | -- | 15 | -- | -- | -- | 273 | 14.9 |
| 73.4 | 256 | -- | 28 | 17 | 11 | 3 | -- | 315 | 17.2 |
| 73.5 | 738 | 353 | 97 | 52 | -- | -- | 2 | 1,242 | 67.7 |
| 75.1 | -- | -- | 2 | -- | -- | -- | -- | 2 | 0.1 |
| 75.6 | 3 | -- | -- | -- | -- | -- | -- | 3 | 0.2 |
| Total | 1,172 | 436 | 127 | 84 | 11 | 3 | 2 | 1,835 | |
| Percent | 63.9 | 23.8 | 6.9 | 4.6 | 0.6 | 0.2 | 0.1 | | |

[1]River kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PP=perched preening, PU=perched unknown, PE= perched eating, PR=perched roosting, PV=perched vocalizing, PK=perched with prey.

## APPENDIX N: RODEO BREEDING AREA SUMMARY

Table 63. Observed human activity and bald eagle behavior, Rodeo BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Apache Helicopter | 5 | -- | -- | -- | -- | 5 | -- | 10 | 33.3 |
| Helicopter | 5 | -- | -- | 1 | -- | 2 | -- | 8 | 26.7 |
| AGFD biologist | -- | -- | 3 | -- | -- | 2 | -- | 5 | 16.7 |
| Nestwatchers | -- | -- | 1 | -- | -- | 2 | -- | 3 | 10.0 |
| Small Plane | -- | 1 | -- | -- | 1 | -- | -- | 2 | 6.7 |
| Gunshot | 1 | -- | -- | -- | -- | -- | -- | 1 | 3.3 |
| Drone | -- | -- | -- | -- | -- | 1 | -- | 1 | 3.3 |
| Total | 11 | 1 | 4 | 1 | 1 | 12 | -- | 30 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 64. Observed forage events and success, Rodeo BA, Arizona, 2022.

| Sex | Fish | | Total | |
|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U |
| Male | 1 | 1-0 | 1 | 1-0 |
| Female | -- | -- | -- | -- |
| Total | 1 | 1-0 | 1 | 1-0 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 65. Observed prey types delivered to the nest, Rodeo BA, Arizona, 2022.

| Sex | Fish | Birds | Unknown | Total | Percent |
|---|---|---|---|---|---|
| Male | 3 | 3 | 13 | 19 | 51.4 |
| Female | 7 | 3 | 8 | 18 | 48.6 |
| Total | 10 | 6 | 21 | 37 | |
| Percent | 27.0 | 16.2 | 56.8 | | |

Table 66. Bald eagle habitat analysis at the Rodeo BA, Arizona, 2022.

| River km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 3.1 | UP | Left | No | 1 | RI | CW |
| 3.1 | UP | Right | No | 1 | RI | CW |
| 3.1 | WO | Right | Partial | 1 | RI | CW |
| 3.6 | CL | Left | Yes | 5 | RU | CW |
| 3.6 | CL | Left | Yes | 5 | RU | CW |
| 3.6 | CL | Left | Yes | 5 | RU | CW |
| 7.0 | DP | Left | No | 2 | PN | GM |

[1]River kilometer.
[2]CL=cottonwood large (>20m), DP=dirt pile, UP=utility pole, WO=willow tree.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]PN=pond, RI=riffle, RU=run.
[5]CW=cottonwood grove, GM=gravel mine.

Table 67. Bald eagle habitat use at the Rodeo BA, Arizona, 2022.

| River km[1] | PW[2,3] | PH | PP | PD | CL | Total | Percent |
|---|---|---|---|---|---|---|---|
| 3.1 | 5,106 | 372 | 337 | 119 | 105 | 6,039 | 65.1 |
| 3.6 | 3,017 | -- | 40 | -- | -- | 3,057 | 33.0 |
| 7.0 | 77 | 100 | -- | -- | -- | 177 | 1.9 |
| Total | 8,200 | 472 | 377 | 119 | 105 | 9,273 | |
| Percent | 88.4 | 5.1 | 4.1 | 1.3 | 1.1 | | |

[1]River kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, PP=perched preening, PD=perched drying, CL=perched close to mate.

## APPENDIX O: SCHOLZ BREEDING AREA SUMMARY

Table 68. Observed human activity and bald eagle behavior, Scholz BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Hiker | 128 | -- | -- | 4 | -- | -- | -- | 132 | 56.4 |
| Picnicker | 34 | -- | -- | -- | -- | -- | -- | 34 | 14.5 |
| Fisherman | 33 | -- | -- | -- | -- | -- | -- | 33 | 14.1 |
| Canoe/Kayak | 19 | -- | -- | 1 | -- | -- | -- | 20 | 8.5 |
| Birder | 4 | -- | -- | -- | -- | -- | -- | 4 | 1.7 |
| Swimmer | 3 | -- | -- | -- | -- | -- | -- | 3 | 1.3 |
| Photographer | 3 | -- | -- | -- | -- | -- | -- | 3 | 1.3 |
| Runner | 3 | -- | -- | -- | -- | -- | -- | 3 | 1.3 |
| Stand up paddleboard | -- | -- | -- | 1 | -- | -- | -- | 1 | 0.4 |
| Gunshots | -- | 1 | -- | -- | -- | -- | -- | 1 | 0.4 |
| Total | 227 | 1 | -- | 6 | -- | -- | -- | 234 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 69. Observed forage events and success, Scholz BA, Arizona, 2022.

| Sex | Fish | | Unknown | | Total | |
|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U |
| Male | 8 | 8-0 | -- | -- | 8 | 8-0 |
| Female | 22 | 21-1 | 2 | 0-2 | 24 | 21-3 |
| Total | 30 | 29-1 | 2 | 0-2 | 32 | 29-3 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 70. Observed prey types delivered to the nest, Scholz BA, Arizona, 2022.

| Sex | Fish | Unknown | Total | Percent |
|---|---|---|---|---|
| Male | 9 | 1 | 10 | 27.0 |
| Female | 22 | 5 | 27 | 73.0 |
| Total | 31 | 6 | 37 | |
| Percent | 83.8 | 16.2 | | |

Table 71. Observed prey species delivered to the nest, Scholz BA, Arizona 2022.

| Sex | Fish | Total | Percent |
|---|---|---|---|
| | CS[1] | | |
| Male | 2 | 2 | 11.8 |
| Female | 15 | 15 | 88.2 |
| Total | 17 | 17 | |
| Percent | 100 | | |

[1]CS=catfish species.

Table 72. Bald eagle habitat analysis at the Scholz BA, Arizona, 2022.

| Lake km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 0.2 | SC | -- | No | 1 | RS | CF |
| 0.2 | SC | -- | No | 5 | RS | CF |
| 0.4 | SC | -- | No | 1 | RS | CF |
| 0.4 | SC | -- | No | 1 | RS | CF |
| 0.7 | PS | -- | Yes | 1 | RS | CF |
| 0.9 | SC | -- | No | 1 | RS | CF |
| 1.0 | SC | -- | No | 2 | RS | CF |
| 1.0 | SO | -- | No | 1 | RS | CF |
| 1.2 | SC | -- | No | 5 | RS | CF |
| 1.3 | SO | -- | No | 1 | RS | CF |
| 1.3 | SC | -- | No | 6 | RS | CF |
| 1.6 | SC | -- | No | 1 | RS | CF |
| 1.7 | PO | -- | Partial | 1 | RS | CF |
| 1.9 | PS | -- | Partial | 1 | RS | CF |
| 2.0 | SC | -- | No | 1 | RS | CF |
| 2.0 | IS | -- | No | 1 | RS | CF |

[1]Lake kilometer.
[2]IS=island, PO=pine/conifer old growth (20-30m+), PS=pine/conifer small (<20m), SC=snag conifer, SO=shore.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RS=reservoir main body.
[5]CF=conifer forest.

Table 73. Bald eagle habitat use at the Scholz BA, Arizona, 2022.

| River km[1] | PW[2,3] | PH | PD | DW | PP | PK | BA | PV | SS | PE | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.2 | 576 | 85 | -- | -- | 21 | -- | -- | 11 | -- | -- | 693 | 14.5 |
| 0.4 | 96 | -- | -- | -- | -- | -- | -- | 3 | -- | 11 | 110 | 2.3 |
| 0.7 | 1370 | 85 | -- | -- | 54 | -- | -- | 8 | -- | -- | 1,517 | 31.7 |
| 0.9 | 233 | -- | -- | -- | -- | 26 | -- | -- | -- | -- | 259 | 5.4 |
| 1.0 | 236 | -- | 79 | 104 | -- | 27 | 41 | -- | 22 | -- | 509 | 10.6 |
| 1.2 | 61 | -- | -- | -- | -- | 17 | -- | -- | -- | 9 | 87 | 1.8 |
| 1.3 | 7 | -- | 102 | 4 | -- | -- | -- | -- | -- | -- | 113 | 2.4 |
| 1.6 | 532 | -- | -- | -- | 18 | -- | -- | 12 | -- | -- | 562 | 11.7 |
| 1.7 | 312 | 26 | -- | -- | -- | -- | -- | -- | -- | -- | 338 | 7.1 |
| 1.9 | 145 | 90 | -- | -- | -- | -- | -- | -- | -- | 4 | 239 | 5.0 |
| 2.0 | 319 | 13 | -- | -- | 14 | -- | -- | -- | 10 | -- | 356 | 7.4 |
| Total | 3,887 | 299 | 181 | 108 | 107 | 70 | 41 | 34 | 32 | 24 | 4,783 | |
| Percent | 81.3 | 6.3 | 3.8 | 2.3 | 2.2 | 1.5 | 0.9 | 0.7 | 0.7 | 0.5 | | |

[1]River kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, PD=perched drying, DW=drinking water, PP=perched preening, PK=perched with prey, BA=bathing, PV= perched vocalizing, SS=standing on shore , PE= perched eating.

## APPENDIX P: SYCAMORE BREEDING AREA SUMMARY

Table 74. Observed human activity and bald eagle behavior, Sycamore BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Horseback group | 1 | -- | -- | -- | -- | 2 | -- | 3 | 21.4 |
| Small Plane | 3 | -- | -- | -- | -- | -- | -- | 3 | 21.4 |
| Helicopter | -- | 1 | -- | -- | 1 | -- | -- | 2 | 14.4 |
| Helicopter, Apache | 1 | -- | -- | -- | -- | 1 | -- | 2 | 14.3 |
| OHV | 1 | -- | -- | -- | -- | 1 | -- | 2 | 14.3 |
| Helicopter, Military | -- | -- | -- | -- | -- | 1 | -- | 1 | 7.1 |
| Construction | 1 | -- | -- | -- | -- | -- | -- | 1 | 7.1 |
| Total | 7 | 1 | -- | -- | 1 | 5 | -- | 14 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 75. Observed forage events and success, Sycamore BA, Arizona, 2022.

| Sex | Fish | | Total | |
|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U |
| Male | 1 | 1-0 | 1 | 1-0 |
| Female | 1 | 1-0 | 1 | 1-0 |
| Total | 2 | 2-0 | 2 | 2-0 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 76. Bald eagle habitat analysis at the Sycamore BA, Arizona, 2022.

| River km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 7.8 | UP | Left | No | 2 | RU | SO |
| 9.9 | SO | Right | No | 1 | RU | SO |
| 10.0 | WO | Left | Partial | 1 | RI | SO |
| 10.1 | SD | Left | Yes | 6 | RI | CW |
| 10.1 | UP | Right | No | 1 | RI | FL |
| 10.1 | SD | Left | No | 5 | RI | CW |
| 10.2 | SM | Right | No | 1 | RU | MB |
| 11.1 | SD | Left | No | 6 | RU | CW |
| 11.1 | SD | Left | No | 6 | RU | CW |

[1]River kilometer.
[2]SD=snag, cottonwood, SM=snag, mesquite, SO=shore, UP=utility pole, WO=willow tree.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RI=riffle, RU=run.
[5]CW=cottonwood grove, FL=farmland, MB=mesquite bosque, SO=shore.

Table 77. Bald eagle habitat use at the Sycamore BA, Arizona, 2022.

| River km[1] | PW[2,3] | CL | PP | PH | ET | ES | SH | BA | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.8 | 694 | 38 | -- | -- | -- | -- | -- | -- | 732 | 24.3 |
| 9.9 | -- | -- | -- | -- | -- | -- | -- | 4 | 4 | 0.1 |
| 10.0 | 85 | -- | -- | 62 | -- | -- | 12 | -- | 159 | 5.3 |
| 10.1 | 1,142 | 7 | 117 | -- | 48 | 38 | -- | -- | 1,352 | 44.8 |
| 10.2 | 96 | -- | -- | 60 | -- | -- | -- | -- | 156 | 5.2 |
| 11.1 | 357 | 192 | 63 | -- | -- | -- | -- | -- | 612 | 20.3 |
| Total | 2,374 | 237 | 180 | 122 | 48 | 38 | 12 | 4 | 3,015 | |
| Percent | 78.7 | 7.9 | 6.0 | 4.0 | 1.6 | 1.3 | 0.4 | 0.1 | | |

[1]River kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, CL=perched close to mate, PP=perched preening, PH=perched hunting, ET=eating in tree, ES=eating on shore, SH=standing in water, BA=bathing in river.

## APPENDIX Q: WOODS CANYON BREEDING AREA SUMMARY

Table 78. Observed human activity and bald eagle behavior, Woods Canyon BA, Arizona, 2022.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Hiker | 362 | 8 | -- | -- | -- | -- | -- | 370 | 83.7 |
| Fisherman | 31 | -- | -- | -- | -- | -- | -- | 31 | 7.0 |
| Canoe/Kayak | 19 | -- | -- | -- | -- | -- | -- | 19 | 4.3 |
| Swimmer | 6 | -- | -- | -- | -- | -- | -- | 6 | 1.4 |
| Stand up paddleboard | 5 | -- | -- | -- | -- | -- | -- | 5 | 1.1 |
| Agency worker | 3 | -- | -- | -- | -- | -- | -- | 3 | 0.7 |
| Birder | 3 | -- | -- | -- | -- | -- | -- | 3 | 0.7 |
| Horseback rider | 2 | -- | -- | -- | -- | -- | -- | 2 | 0.5 |
| Photographer | 2 | -- | -- | -- | -- | -- | -- | 2 | 0.5 |
| Runner | 1 | -- | -- | -- | -- | -- | -- | 1 | 0.2 |
| Total | 434 | 8 | -- | -- | -- | -- | -- | 442 | |

[1]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=bird not in area, U=unknown.

Table 79. Observed forage events and success, Woods Canyon BA, Arizona, 2022.

| Sex | Fish | | Bird | | Total | |
|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U |
| Male | 1 | 0-1 | 1 | 0-1 | 2 | 0-2 |
| Female | 1 | 1-0 | -- | -- | 1 | 1-0 |
| Total | 2 | 1-1 | 1 | 0-1 | 3 | 1-2 |

[1]E=A single forage event, not the number of attempts during 1 event.
[2]S-U= Successful – Unsuccessful forage events.

Table 80. Bald eagle habitat analysis at the Woods Canyon BA, Arizona, 2022.

| River km[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 0.1 | PO | -- | Yes | 1 | RM | CF |
| 0.6 | PO | -- | Partial | 1 | RM | CF |
| 0.6 | SC | -- | No | 4 | RM | CF |
| 0.7 | SC | -- | No | 4 | RM | CF |
| 0.7 | PS | -- | No | 3 | RM | CF |
| 0.7 | PO | -- | Partial | 3 | RM | CF |
| 0.7 | PO | -- | Yes | 3 | RM | CF |
| 0.8 | SC | -- | No | 1 | RM | CF |
| 0.8 | PO | -- | Yes | 2 | RM | CF |
| 0.8 | SC | -- | No | 2 | RM | CF |
| 4.6 | PO | -- | Partial | 1 | RM | CF |

[1]River kilometer.
[2]PO= pine/conifer, old growth 20-30+m, PS=pine, small <20m, SC=snag conifer.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RM=reservoir main body.
[5]CF=coniferous forest.

Table 81. Bald eagle habitat use at the Woods Canyon BA, Arizona, 2022.

| River km[1] | PW[2,3] | PP | PD | PV | PE | Total | Percent |
|---|---|---|---|---|---|---|---|
| 0.1 | 223 | -- | -- | -- | -- | 223 | 13.7 |
| 0.6 | 69 | 0 | 0 | 5 | 0 | 74 | 4.6 |
| 0.7 | 756 | 93 | 81 | 16 | 10 | 956 | 58.8 |
| 0.8 | 226 | 0 | 0 | 0 | 6 | 232 | 14.3 |
| 4.6 | 138 | -- | -- | 3 | -- | 141 | 8.7 |
| Total | 1,412 | 93 | 81 | 24 | 16 | 1,626 | |
| Percent | 86.8 | 5.7 | 5.0 | 1.5 | 1.0 | | |

[1]River kilometer.
[2]Observation time (minutes).
[3]PW=perched watching, PP=perched preening, PD=perched drying, PV= perched vocalizing, PE= perched eating.