# ARIZONA BALD EAGLE MANAGEMENT PROGRAM
# 2012 SUMMARY REPORT

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*Photo by George Andrejko*

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This report, in part, summarizes the results of monitoring by the Arizona Bald Eagle Nestwatch Program using the breeding area reports submitted in 2012. Those include: Michael Cravens and Gretchen Henne, Cliff Breeding Area (BA); James Butch and Ryan Mong, Box Bar BA; Jean Spilker and Hailee Newman, Goldfield and Show Low Lake BAs; Joe Peddie and Marta Peddie, Crescent and Luna BAs; Kristan Godbeer and Emily Willard, Orme and Granite Reef BAs; Russell Seeley and John Martineau, Rodeo and Doka BAs; Dave Janssen and Troy Maikis, Pinto BA; Leah Vader and Jen Ottinger, Sycamore and Fort McDowell BAs; Grant Cooper and Joan Wike, Tonto BA; Dave Janssen and Joan Wike, Woods Canyon BA.

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# ARIZONA BALD EAGLE MANAGEMENT PROGRAM 2012 SUMMARY REPORT

Kyle M. McCarty and Kenneth V. Jacobson

## 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 5 others (USFWS 1982). In Alaska, the USFWS did not list the species 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, 2007). In August 2006, the USFWS denied a petition to recognize bald eagles breeding in the Sonoran Desert of central Arizona as a Distinct Population Segment (DPS). As a result of a lawsuit challenging this decision, the U.S. District Court for the District of Arizona issued a ruling in March 2008 ordering the USFWS to conduct a status review to determine if listing the population as a DPS was warranted, and if so then to decide if listing the DPS as threatened or endangered under the ESA was warranted (USFWS 2008). Following the court order, USFWS designated bald eagles in central Arizona as a threatened DPS while the status review was undertaken (USFWS 2008). In February 2010, the USFWS determined that the Sonoran Desert Area population did not satisfy the definition of a DPS and was therefore not eligible for listing (USFWS 2010). In October 2010, the Court lifted its injunction against USFWS. On September 2, 2011, the USFWS removed bald eagles in the Sonoran Desert Area from the list of endangered and threatened species (USFWS 2011). In November 2011, a further legal challenge resulted in another court order to draft a new 12-month finding on the basis that the previous one was procedurally flawed. In the revised finding announced in April 2012, the USFWS again determined that the Sonoran Desert Area population did not satisfy the definition of a DPS and was therefore not eligible for listing (USFWS 2012), and further concluded that listing would not be warranted even if the population met the DPS criteria. In October 2012, the Center for Biological Diversity and Maricopa Audubon Society filed a lawsuit against USFWS over the revised 12-month finding.

The bald eagle remains protected in the state under Arizona Revised Statute Title 17 and nationally under the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, Lacey Act, Airborne Hunting Act, and the Convention on International Trade in Endangered Species of Wild Flora and Fauna.

To enhance coordination, increase communication, and provide oversight for Arizona bald eagle management, land and wildlife management agencies formed the Southwestern Bald Eagle Management Committee (SWBEMC) in 1984. Today, the members include: Arizona Game and Fish Department (AGFD), Arizona Department of Transportation, Arizona Public Service (APS), Arizona State Parks Department, American Eagle Research Institute, Arizona Army National Guard, Fort McDowell Yavapai Nation (FMYN), Geo-Marine (U.S. Air Combat Command), Gila River Indian Community (GRIC), The Hopi Tribe, Maricopa County Parks and Recreation Department (MCPRD), Freeport McMoRan, Navajo Nation Fish and Wildlife, Salt River Pima-Maricopa Indian Community (SRPMIC), Salt River Project (SRP), San Carlos

Apache Tribe (SCAT), Tonto Apache Tribe, U.S. Army Corps of Engineers (ACE), U.S. Bureau of Indian Affairs, U.S. Bureau of Land Management, U.S. Bureau of Reclamation (USBR), U.S. Department of Defense (Luke Air Force Base), U.S. Forest Service (USFS), USFWS, U.S. National Park Service, and White Mountain Apache Tribe. In 2007, some members of the SWBEMC signed the Conservation Assessment and Strategy for Bald Eagles in Arizona (CAS), which describes bald eagle management in the state and outlines the strategy for continuing management (Driscoll et al. 2006). The CAS also specifies current threats facing bald eagles in Arizona and identifies management actions necessary to maintain their distribution and abundance in the state following delisting.

## STUDY AREA

Statewide monitoring and surveys were conducted primarily within 6 biotic communities (Brown 1994): Rocky Mountain (Petran) and Madrean Montane Conifer Forest, Great Basin Conifer Woodland, Plains and Great Basin Grasslands, Sonoran Desertscrub-Arizona Upland Subdivision, Interior Chaparral, and Sonoran Riparian Deciduous Forest and Woodlands. Other biotic communities visited included Chihuahuan Desertscrub, Mohave Desertscrub, Great Basin Desertscrub, Semidesert Grassland, Subalpine Grassland, Madrean Evergreen Woodland, and Sonoran Desertscrub-Lower Colorado River Valley Subdivision.

Most bald eagle breeding areas (BAs) are in central Arizona between elevations of 329 m (1,080 ft) and 1,341 m (4,400 ft). They are primarily found within the riparian areas of the Sonoran Riparian Scrubland and Sonoran Interior Strands as described in Brown (1994) (Figure 1). Representative riparian vegetation includes Fremont cottonwood (*Populus fremonti*), Goodding willow (*Salix gooddingii*), Arizona sycamore (*Platanus wrightii*), and nonnative salt cedar (*Tamarix* spp.). Surrounding uplands include the Sonoran Desertscrub biome-Arizona Upland subdivision, Interior Chaparral biome, and Great Basin Conifer Woodland biome. These areas are commonly vegetated with blue palo verde (*Parkinsonia florida*), mesquite (*Prosopis* spp.), ironwood (*Olneya tesota*), saguaro (*Carnegiea gigantea*), teddy bear cholla (*Opuntia bigelovii*), juniper (*Juniperus* spp.), and pinyon pine (*Pinus edulis*).

Fifteen BAs are located outside of or do not include Sonoran Riparian Scrubland areas (Brown 1994). The Becker, Silver Creek, and Sullivan Lake BAs are within the Plains and Great Basin Grassland biome where the nests are in isolated stands of Fremont cottonwoods. Crescent, Dupont, Greer Lakes, Lower Lake Mary, Luna, Lynx, Show Low Lake, White Horse, and Woods Canyon BAs are in Rocky Mountain and Madrean Montane Conifer Forest, where riparian vegetation includes narrow-leaf cottonwood (*Populus angustifolia*), thin-leaf alder (*Alnus tenuifolia*), Bebb's willow (*Salix bebbiana*), and coyote willow (*S. exigua*) (Brown 1994). Rock Creek is located in Rocky Mountain Montane Conifer Forest surrounded by Interior Chaparral, consisting mainly of pinyon-juniper woodland, shrub live oak (*Quercus turbinella*), and pointed (*Arctostaphylos pungens*) and pringle manzanita (*A. pringlei*). Canyon De Chelly BA is located in a Rocky Mountain Conifer forest mixed with Great Basin Conifer Woodland and Desertscrub, consisting mainly of big sagebrush (*Artemisia tridentata*), blackbrush (*Coleogyne ramosissima*), and shadscale (*Atriplex confertifolia*). The Gilbert BA is located in the

Phoenix metropolitan area and includes no natural riparian communities, with only artificial water formations such as recharge basins, urban ponds, and canals.

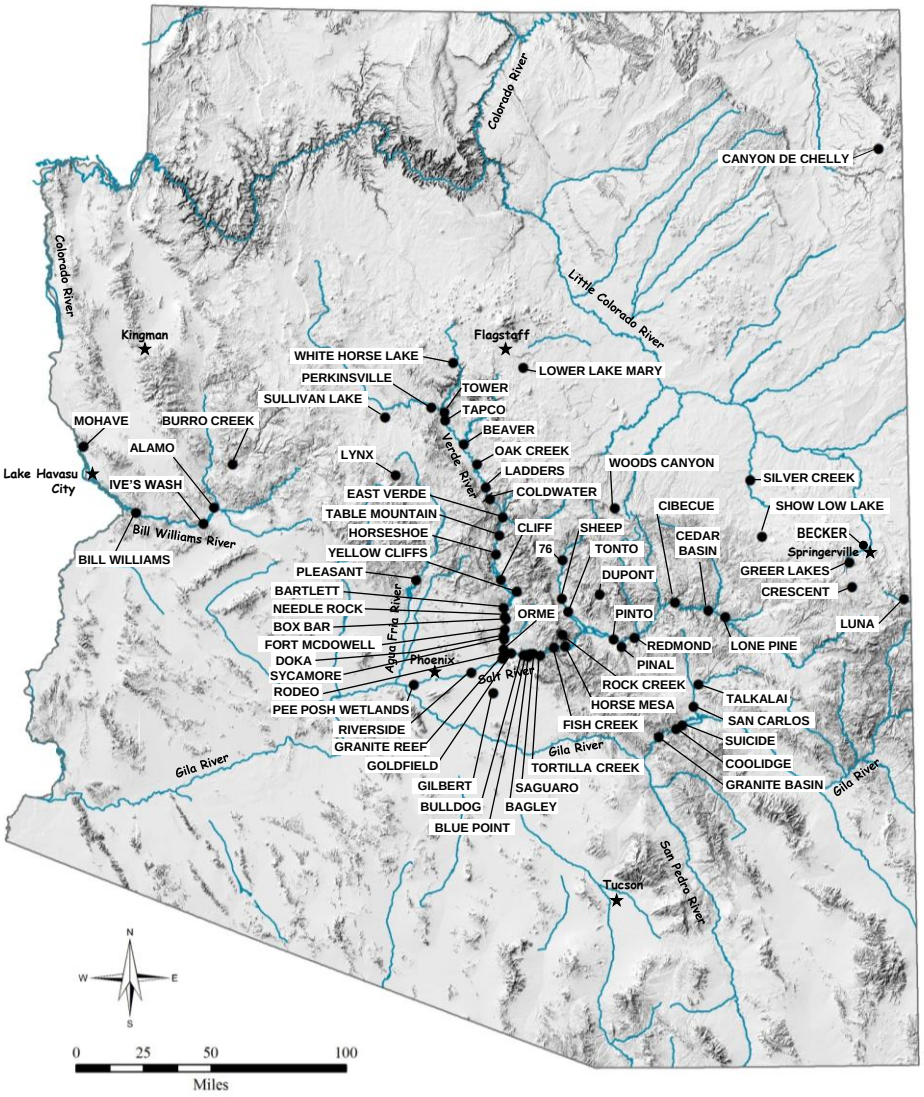



*Figure 1. Location of known bald eagle BAs in Arizona, 2012.*

With the exception of the Dupont, Mohave, and Rock Creek BAs, bald eagles in Arizona nest within a mile of water. BAs were located along: Burro, Cibecue, Oak, Pinal, Silver, Tangle, Tonto, and Walnut creeks; Alamo, Apache, Bartlett, Crescent, Greer, Horseshoe, Lower Lake Mary, Luna, Lynx, Pleasant, Roosevelt, Saguaro, San Carlos, Talkalai, and Woods Canyon lakes or reservoirs; and the Agua Fria, Bill Williams, Colorado, Little Colorado, Gila, Salt, San Carlos, San Francisco, and Verde rivers. Nests within these drainages are usually on cliff ledges, rock pinnacles, and in cottonwood trees. However they also have been found in junipers, pinyon and ponderosa pines, sycamores, willows, snags, and 1 artificial structure (Horseshoe BA in 1980) (Grubb 1980).

## ARIZONA BALD EAGLE WINTER COUNT

### INTRODUCTION

Because bald eagles are nomadic in winter, national winter surveys are an effective tool to monitor the species throughout its range (Stalmaster 1987). The knowledge of wintering bald eagle habitat use allows for the consideration and implementation of management to protect important wintering areas. Even though the USFWS delisted the species nationwide in 2007 (USFWS 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 (Steenhof et al. 2002, 2008).

The National Wildlife Federation (NWF) initiated and organized the national midwinter bald eagle count from 1979-1992. Coordination shifted to the U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Snake River Field Station (USGS), which in 2007 partnered with the ACE, who now coordinates the national winter count effort. Arizona participated in the program from the 1970s to the early 1980s (e.g. 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 2 or more years). Due to Arizona's lack of "concentrations", we contributed minimal information in 1986 and 1987, and surveyed only specific management areas in 1989-1991 such as Roosevelt Lake and Nankoweap Creek (e.g. Brown and Stevens 1992). Arizona's statewide winter counts resumed in 1992, using a combination of terrestrial (foot, snowmobile, vehicle), boat, and aircraft surveys (e.g. McCarty and Jacobson 2011). In 1995, AGFD 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 included new routes for future surveys. If a route produced 3 or fewer birds during the past 10 years of surveys, the route was dropped per USGS protocol. As a result, in 2006 we dropped 23 routes 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 count.

### METHODS

We continued to use, and strived to complete, the established 102 standardized survey routes for the 2012 Arizona bald eagle winter count. Additional routes were completed and integrated into this document for management purposes, but were not included in the results submitted to the ACE. We scheduled the winter count for January 9-15, 2012, 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

best method to survey the rugged terrain and deep canyons of linear drainages was by helicopter. USBR and SRP contributed a total of 4 days of helicopter time for 2-3 biologists and a pilot to fly 25 routes. While the helicopter's altitude and speed were dependent upon terrain, height and density of power lines, and wind speed, a height of 31-61 m (100-200 ft) above ground level and 55-65 knots (63-75 mph) was optimum for observing bald eagles. 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. We supplied survey forms from ACE and instructed participants on the National Survey Protocol.

We classified the bald eagle sightings into adult and subadult age classes. In addition, we included sightings of unknown age bald eagles and unidentified eagles in our totals in order 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. We also recorded sightings of golden eagles (*Aquila chrysaetos*) during the survey, but did not report them in this document. We divided the data into 2 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, 4 counties are no longer surveyed by ground methods for wintering bald eagles. These include Greenlee, Maricopa, Pima, and Pinal counties. However, Greenlee, Maricopa, and Pinal counties are surveyed for wintering bald eagles, in part, by the helicopter flights.

## RESULTS AND DISCUSSION

The 2012 Arizona bald eagle winter count tallied 298 bald eagles (Table 1). We documented 189 adults (63%), 94 subadults (32%), and 15 unknown eagles (5%) (Tables 1 & 2).

Table 1. Summary of the Arizona bald eagle winter count 2012.

| County | Routes surveyed | Minutes | Adult | Subadult | Unknown[1] | Total | Total/ Hour |
|---|---|---|---|---|---|---|---|
| Apache | 15 | 695 | 12 | 3 | 2 | 17 | 1.5 |
| Cochise | 2 | 295 | 0 | 0 | 0 | 0 | 0 |
| Coconino | 33 | 5,035 | 58 | 40 | 7 | 105 | 1.3 |
| Graham | Not surveyed. | | | | | | |
| Mohave | 1 | 100 | 2 | 3 | 0 | 5 | 3.0 |
| Navajo | 16 | 934 | 17 | 5 | 1 | 23 | 1.5 |
| Santa Cruz | 1 | 120 | 0 | 0 | 0 | 0 | 0 |
| Yavapai[2] | 6 | 1,965 | 6 | 7 | 2 | 15 | 0.5 |
| Yuma and La Paz | 1 | 360 | 2 | 2 | 0 | 4 | 0.7 |
| Verde River drainage | 3 | 211 | 22 | 12 | 0 | 34 | 9.7 |
| Salt River drainage | 9 | 369 | 52 | 13 | 3 | 68 | 11.1 |
| Gila River drainage | 8 | 209 | 15 | 9 | 0 | 24 | 6.9 |
| Various helicopter | 5 | 27 | 3 | 0 | 0 | 3 | 6.7 |
| Totals | 100 | 10,320 | 189 | 94 | 15 | 298 | 1.7 |

[1] Unknown age bald eagles and unidentified eagles.
[2] Includes one route for which survey time was not recorded, but averaged from previous year's counts.

The highest number of bald eagles observed during ground surveys occurred in Coconino County, with the largest concentration seen on a single ground survey occurring on the I-17 route south of Flagstaff (n=18) (Appendix A). Also, a large number of bald eagles were observed by helicopter along the Black River (n=36). An additional five bald eagles were counted on six non-standardized routes (Appendix A), but were not included in summary results.

Table 2. Summary of Arizona bald eagle winter counts 1995-2012.

| Year | Survey time (min) | Surveys completed | Birds/minute | Adults | Subadults | Unknown[3] | Total |
|---|---|---|---|---|---|---|---|
| 1995 | 9,563 | 103 | 0.025 | 164 (66%) | 76 (31%) | 8 (3%) | 248 |
| 1996 | 7,255 | 102 | 0.049 | 232 (64%) | 127 (35%) | 2 (1%) | 361 |
| 1997 | 7,718 | 96 | 0.044 | 193 (56%) | 134 (39%) | 16 (5%) | 343 |
| 1998 | 7,190[1] | 93 | 0.041 | 183 (63%) | 103 (36%) | 4 (1%) | 290 |
| 1999 | 8,378[1] | 105 | 0.050 | 248 (62%) | 144 (36%) | 11 (3%) | 403 |
| 2000 | 9,402[1] | 110 | 0.034 | 202 (62%) | 115 (35%) | 8 (2%) | 325 |
| 2001 | 8,726[1] | 108 | 0.024 | 141 (66%) | 70 (32%) | 5 (2%) | 216 |
| 2002 | 9,032 | 109 | 0.044 | 236 (59%) | 147 (37%) | 19 (5%) | 402 |
| 2003 | 10,036[1] | 110 | 0.036 | 232 (64%) | 118 (33%) | 12 (3%) | 362 |
| 2004 | 10,587 | 110 | 0.034 | 243 (66%) | 113 (31%) | 13 (3%) | 369 |
| 2005 | 8,910 | 97 | 0.069 | 153 (68%) | 56 (25%) | 15 (7%) | 224 |
| 2006[2] | 10,074 | 104 | 0.031 | 239 (74%) | 77 (24%) | 7 (2%) | 323 |
| 2007 | 11,632[1] | 100 | 0.024 | 192 (68%) | 81 (29%) | 8 (3%) | 281 |
| 2008 | 9,362 | 96 | 0.020 | 152 (82%) | 29 (16%) | 4 (2%) | 185 |
| 2009 | 9,357 | 94 | 0.022 | 139 (68%) | 62 (30%) | 3 (2%) | 204 |
| 2010 | 9,138[1] | 96 | 0.028 | 159 (63%) | 81 (32%) | 12 (5%) | 252 |
| 2011 | 8,713[1] | 93 | 0.025 | 157 (71%) | 57 (26%) | 8 (4%) | 222 |
| 2012 | 10,320 | 100 | 0.026 | 189 (63%) | 94 (32%) | 15 (5%) | 298 |
| Average | 9,256 | 101 | 0.035 | 192 (65%) | 94 (32%) | 9 (3%) | 295 |

[1]Some survey times not recorded. Times averaged from reported times of previous counts.
[2]Beginning of 104 standardized routes derived from the analysis of 1995-2005 surveys.
[3]Unknown age bald eagles and unidentified eagles.

In 2012, Arizona surveyed 100 of the 102 standardized routes (98%) (Table 2). Survey effort was well above the long-term average, with a total of 10,320 minutes (172 hours), making it the third highest recorded since the project began. Coconino County had the most number of routes and therefore had the most effort with 5,035 minutes (83.9 hours) (Appendix A). In the past several years, deep snow and muddy roads caused some routes to be inaccessible and led to multiple unsurveyed areas. Winter conditions this year were mild by comparison and allowed surveyors to reach nearly all the routes. 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. Most responded that this year's weather was normal (56%) or mild (36%), and a few responded very mild (6%) or harsh (1%) (n=94). There were no responses for very harsh weather. Similarly, ice cover was rated as being normal (56%), less than normal (23%), much less than normal (16%), and more than normal (5%) (n=87). There were no responses for much more than normal ice cover.

The total of 298 bald eagles counted in 2012 approximated the average of 295 birds counted annually during standardized counts, 1995-2011, and was the highest count since 2006. The ability to cover more routes this year than in 2008-2011 does not appear to have been the factor to bring the totals up from those years, as only four bald eagles were counted in 2012 on the routes (n=4) that were missed in at least three of the last four years. The age composition of this year's winter count was 63% adults, 32% subadults, and 5% unknown, and represents the typical ratio of adults to subadults seen in Arizona's winter counts, which has averaged 65% adults, 32% subadults, and 3% unknown (Table 2).

### MANAGEMENT RECOMMENDATIONS

1. Maintain the current 102 standardized routes.
2. Continue to assess non-standardized routes and add new routes for areas with consistent sightings of more than 3 bald eagles. The national coordinators require at least 4 years of data before a route is included in trend analyses.
3. Maintain winter count consistency by following established routes and methods to enable long-term analysis.
4. Continue updating the Nongame Branch bald eagle winter count database with information from the standardized survey forms.
5. Compile spatial data from winter count survey maps to document the location and abundance of wintering bald eagles, spatially identify important habitat use areas, and develop statewide maps for distribution to cooperating agencies.

## ARIZONA BALD EAGLE NEST SURVEY

### INTRODUCTION

The bald eagle nest survey enhances 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 also identifies 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. McCarty and Jacobson 2011). The AGFD administered and performed the 2012 nest surveys in cooperation with the SWBEMC.

### METHODS

Habitat quality, the presence of nests, previous bald eagle sightings, and spacing between BAs prioritized survey effort. We monitored breeding activity at current and historical BAs, and nest sites discovered between 1992 and 2011 (e.g. McCarty and Jacobson 2011). We also investigated reports of bald eagles and nests by other agencies, biologists, and the public. A two

to three-person team conducted surveys between January and June 2012. Winter count flights (January), monthly Occupancy and Reproductive Assessment (ORA) flights (February to June), and nest search flights (April and May) were used to locate nests and survey for new BAs. Timing of the ORA flights corresponded with the timing of different breeding stages (incubation, hatching, nestling, and fledging).

Boats, helicopters, and vehicles were used to access survey areas. Helicopters, provided by APS, SRP, and USBR, flew at approximately 60 meters (200 ft) above ground level and at 50-60 knots (58-70 mph). Drainage topography, high-tension wires, and wind influenced altitude and speed. If nest occupancy could not be determined from the air, a ground survey ensued. We used Questar® spotting scopes (40-160x), binoculars (10x), nest map atlases from Hunt et al. (1992) and SRP (2010), and handheld GPS units to relocate historical 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 and Jacobson 2011).

Determination of breeding status followed operational definitions derived from Postupalsky (1974, 1983) and Steenhof and Kochert (1982) (Appendix B). Additionally, we use 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.

## RESULTS

We examined all known BAs (n=66) for breeding activity (Fig. 1). Of 54 occupied BAs, 50 pairs were active, and 31 pairs successfully produced 52 fledglings (Table 3; Appendix C). Significant findings of the 2012 nest survey included 4 new bald eagle BAs, 12 new alternate bald eagle nests, 9 fallen or partially fallen nests within BAs, and 5 new potential nest sites. Additionally, we surveyed one BA on the Nevada side of the Colorado River, which was discovered in 2010 by the NPS, and one BA in California, however only nests on the Arizona side of the river were included in summaries.

Table 3. Summary of Arizona bald eagle productivity 2012.

| | | | |
|---|---|---|---|
| Number of BAs | 66 | Number of Active BAs | 50 |
| Number of Occupied BAs | 54 | Number of Failed Breeding Attempts | 19 |
| Number of Eggs | 80 | Number of Successful Breeding Attempts | 31 |
| Nest Success = 31/54 | 0.57 | Number of Young Hatched | 66 |
| Mean Brood Size = 52/31 | 1.68 | Number of Young Fledged | 52 |
| | | Productivity = 0.57*1.68 | 0.96 |

Results of the individual flights are located in Appendix D. Areas worthy of further discussion (bald eagle observations, fallen nests, new nests, potential nest sites) are described here. Nest locations are sensitive data, considered confidential by AGFD, and omitted from this report. Management agencies requiring specific locations should contact the AGFD Heritage Data Management System at (623) 236-7612.

New Locations Surveyed (Table 4)

*Bill Williams Refuge.* – In February, USFWS personnel reported a large nest (#1) in a live cottonwood tree on the Bill Williams National Wildlife Refuge and confirmed a bald eagle pair was incubating on February 9. Reports indicate that the male of the pair was in near-adult plumage, the female in adult plumage, and at least one of the pair had a blue band (possibly the female). The new breeding area was named Bill Williams Refuge.

*George's Basin.*– On January 11, we found two adult bald eagles perched together near a new large nest (#1) in a pine snag. On January 31, we saw one adult perched in the same spot, and found a second adult at a small tank about 2.5 miles to the north. On March 22, no adults were seen and the nest was empty. We will continue to monitor this area.

*Gilbert.* – On February 14, Department personnel confirmed a pair of bald eagles at a new nest (#1) in a eucalyptus tree (*Eucalyptus sp.*) in the town of Gilbert, and incubation was confirmed by March 7. The adult female eagle had a blue VID band on the left leg (21/C; Needle Rock 2007 nestling) and some dark spotting on the crown of the head. The adult male had no bands. The new breeding area was named Gilbert.

*Popcorn Canyon.* – On May 31, we saw one adult bald eagle along the Salt River by Popcorn Canyon, in about the same area that two adults were seen last year. No new nests were found, and we will continue to monitor this area.

*Sheep Creek.* – On March 16, we saw one adult bald eagle perched at the confluence of the Verde River and Sheep Creek, in the same location that adults have been seen in previous years. No new nests were found, and we will continue to monitor this area.

*Show Low Lake.* – In December 2011, the USFS saw bald eagles working on a nest (#1) in a dead pine tree at the lake, and incubation was confirmed by March 29, 2012. The adult female eagle had no bands, and the adult male had a blue VID band on the left leg. The new breeding area was named Show Low Lake.

Table 4. 2012 Arizona bald eagle nest survey summary, new locations (continued next page).

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Bill Williams Refuge | 4/16, 4/17 | Helicopter, Ground | 2/9- USFWS confirmed incubation in tree nest #1.<br>4/16- At least two 4.5-week old nestlings. |
| Topock Marsh (CO River) | 4/16 | Helicopter | No new nests or bald eagles. |
| George's Basin | 1/11, 1/31, 3/22 | Helicopter | 1/11- Two adults in area of new snag nest #1.<br>1/31- One adult in area. |

Table 4 continued.

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Gila River, lower (Tres Rios to Buckeye) | 4/16 | Helicopter | No new nests or bald eagles. |
| Gilbert | 2/14, 3/7, 4/10 | Ground | 2/14- Pair of adults seen at new nest (#1) in eucalyptus tree. 3/7- Adult incubating. |
| Goldwater Lake | 4/25 | Helicopter | No new nests or bald eagles. |
| Popcorn Canyon (Salt River) | 5/31 | Helicopter | One adult in area. |
| Scott Reservoir | 5/31 | Helicopter | No new nests or bald eagles. |
| Sheep Creek | 3/16 | Helicopter | One adult in area. |
| Show Low Lake | 4/23, 4/24, 5/31 | Helicopter | 3/29- Report of adult incubating in nest #1. |

Historic Breeding Areas (Table 5)
*Hell Point.* – On March 16, there was a golden eagle incubating in nest #3, which was also seen incubating or brooding on April 25.

Table 5. 2012 Arizona bald eagle nest survey summary, historic breeding areas.

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Canyon | 1/10 | Helicopter | All known nests empty. No bald eagles. |
| Devil's Post | 3/16 | Helicopter | All known nests empty. No bald eagles. |
| Hell Point | 1/9, 1/30, 3/16, 4/25 | Helicopter | 3/16- Golden eagle incubating in nest #3. |
| Mule Hoof | 1/11, 1/31 | Helicopter | All known nests empty. No bald eagles. |
| Winkelman | 1/31 | Helicopter | No new nests or bald eagles. |

Survey Sites with Existing Large Nests (Table 6)
*Bear Canyon Lake.* – On May 31, ospreys were active in nest #1. No bald eagles were seen.

*Black Canyon Lake.* – On May 31, nest #1 (platform) was not found and presumed to have fallen. No bald eagles were seen.

*Blue Ridge Reservoir.* – On May 31, a pair of ospreys was seen at nest #2. Nest #5 was not found. Nests #1, 3, and 4 were not found for the third consecutive year and were presumed fallen. No bald eagles were seen.

*Dogtown Lake.* – On May 31, nest #1 was found to have fallen. No bald eagles were seen.

*Granite (Verde River).* – On January 9 and March 16, one golden eagle was seen perched in the area. On January 30, we found a new large cliff nest (#5) in the area.

*JD Dam Lake.* – On May 31, ospreys were active in both nests #1 and new snag nest #2. No bald eagles were seen.

*Sunflower Flat.* – On May 31, nest #2 was found to have fallen. Ospreys were active in nest #1. No bald eagles were seen.

*Watson Lake*. – On April 25, one golden eagle was seen perched in the area of nest #1, which was empty.

*White Horse Lake*. – On May 18, USFS volunteers reported a bald eagle on a nest at the lake, and one 2.5-week old nestling was confirmed on May 23 by USFS and AGFD personnel. The nest (#4) was on a square platform atop a pine snag which had been originally installed by the USFS for ospreys. Both of the adult eagles had a blue VID band on their left legs, but only the female was identified (18/Y; Lynx 2006 nestling). The new bald eagle breeding area includes three previously known ospreys nests (#1-3), and one new nest (#5) occupied by a pair of ospreys on June 29.

*Willow Springs Lake.* – On May 31, ospreys were active in nests #1-5. We found a new snag nest (#6) 1.8 miles to the northeast of the lake also active with ospreys. No bald eagles were seen.

Table 6. 2012 Arizona bald eagle nest survey summary, potential nest sites (continued next page).

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Bear Canyon Lake | 5/31 | Helicopter | Ospreys active in nest #1. No bald eagles. |
| Bill Williams River | 4/16 | Helicopter | All known nests empty. No bald eagles. |
| Black Canyon Lake | 5/31 | Helicopter | Nest #1 fallen. |
| Blue Ridge Reservoir | 5/31 | Helicopter | Ospreys active in nest #2. Nests #1, 3, 4, and 5 not found. No bald eagles. |
| Dogtown Lake | 5/31 | Helicopter | Nest #1 fallen. No bald eagles. |
| Eagle (Eagle Creek) | 1/12 | Helicopter | No new nests or bald eagles. |
| Gene Wash (CA) | 4/16 | Helicopter | All known nests empty. No bald eagles. |
| Granite (Verde River) | 1/9, 1/30, 3/16, 4/25 | Helicopter | 1/9- One golden eagle in area. 1/30- New cliff nest #5 empty. 3/16- One golden eagle in area. |
| JD Dam Lake | 5/31 | Helicopter | Osprey active in nest #1 and new snag nest #2. No bald eagles. |
| Knoll Lake | 5/31 | Helicopter | All known nests empty. No bald eagles. |
| Mormon Pocket (Verde River) | 1/9, 1/30, 3/16, 4/25 | Helicopter | All known nests empty. No bald eagles. |
| Mt. Davis (CO River) | 4/16 | Helicopter | All known nests empty. No bald eagles. |
| Nevada Bay (CO River) | 4/16 | Helicopter | All known nests empty. No bald eagles. |
| Ringbolt Rapids (CO River) | 4/16 | Helicopter | All known nests empty. No bald eagles. |
| Sunflower Flat | 5/31 | Helicopter | Nest #2 fallen. Ospreys active in nest #1. |
| Watson Lake | 1/30, 3/16, 4/25 | Helicopter | 4/25- One golden eagle in area. |
| White Horse Lake | 5/23, 5/31, 6/13, 6/14, 6/28, 6/29, 7/9 | Helicopter, Ground | 5/18- Report from USFS of a new bald eagle nest. 5/23- One 2.5 week-old nestling in nest #4. 6/29- Pair of ospreys perched by new snag nest #5. |

Table 6 continued.

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Willow (Willow Creek) | 1/12 | Helicopter | No new nests or bald eagles. |
| Willow Springs Lake | 5/31 | Helicopter | Ospreys active in nests #1- 5, and new snag nest #6. No bald eagles. |

Breeding Areas (Table 7)

*Bagley and Blue Point.* – The Blue Point nest #10 was discovered in 2000 and was last used by the Blue Point pair in 2009, the latter being the same year that the Bagley BA was discovered. In 2010-2011, the Blue Point BA was unoccupied. This year nest #10 was used again, however we read the bands of the adults on April 4 and confirmed that it was the Bagley eagle pair that had taken over this nest (now called Bagley nest #2).

*Becker.* – This year marked the tenth consecutive year that this site has been unoccupied. Becker will now be designated as a historical BA. We will continue to monitor the area for bald eagle breeding activity.

*Black Canyon (Colorado River).* – On February 10, the NPS observed an adult bald eagle incubating in nest #1. On April 16, we found at least one nestling 4.5-5 weeks old in the nest. The NPS reported that the nestling was seen dead by May 30 on a ledge by the nest, around fledging age. We will continue to monitor this area.

*Cedar Basin.* – On January 11, one adult bald eagle was observed downstream of the nest area. All known nests were empty.

*Coolidge.* – On January 10, one adult bald eagle was observed in the nest area. All known nests were empty.

*Doka.* – On January 9, we found nest #5 had fallen and one adult bald eagle incubating in a new live cottonwood tree nest (#6).

*Ft. McDowell.* – On January 9, we found two adult bald eagles standing in a new cottonwood tree nest (#18), and observed incubation in this nest on January 30.

*Granite Basin.* – On April 26, we saw two adult bald eagles perched in the area of nest #2. All known nests were empty.

*Granite Reef.* – On January 30, we found an adult bald eagle incubating in a new cottonwood tree nest (#5).

*Greer Lakes.* – On March 12, the USFS reported at least one adult bald eagle in the area of nest #4. That same day, we found a new osprey-type snag nest (#5) in the Little Colorado River canyon downstream of the lakes during a golden eagle nest search flight. On April 22, a

contracted bald eagle nestwatcher from the Luna BA observed two adults in the lake area. On April 24, we found ospreys active in nest #3 and in a new snag nest (#6), and observed an immature bald eagle at River Reservoir. We also found nest #2 fallen.

*Horseshoe.* – On February 21, we observed one adult bald eagle in the area. All known nests were empty.

*Lone Pine.* – On January 11, we found nest #5 had fallen.

*Lynx.* – On January 9, we found nest #3 had been re-built, and observed incubation in this nest on January 30.

*Mohave.* – On April 16, nest #1 was in very good condition and we found three new large cliff nests (#2, 3, and 4) in the area which were in fair to good condition. No bald eagles were seen.

*Needle Rock.* – On January 9, we found nest #2 had fallen.

*Orme.* – On July 27, 2011, we removed nest #6 due to a tick infestation, and in September-October 2011 built two new nests (#7, 8) in the area using natural materials. On January 30, we confirmed an adult bald eagle incubating in nest #7.

*Pee Posh Wetlands.* – On January 9, we found an adult bald eagle incubating in a new tree nest (#3). On April 10, the GRIC reported that an arson fire had burned the nest area, destroying nest #3 and killing the two 8.5-9 week old nestlings. Due to the limited number of useable nesting trees in the area, on September 17 we placed a "starter" nest platform of natural materials constructed by Liberty Wildlife in one of the remaining cottonwood trees.

*Pinto.* – On November 30, 2011, USFS personnel reported that nest #7 had fallen, and that there were two adults in the area potentially building a new nest. On January 10, we confirmed a new snag nest (#8), and observed incubation in that nest on March 22.

*Pleasant.* – In December 2011, MCPRD and AGFD personnel observed two pairs of bald eagles, one pair in full adult plumage at nest #3 and one pair of near-adults at nest #2. Although mostly adult in appearance, the younger pair both exhibited dark markings on either the head or tail feathers. The female was seen perching in nest #2, with the male hunting nearby, indicating they were potentially attempting to takeover a portion of the Pleasant BA and establish a second BA at the lake.

*Saguaro.* – On January 10 and 31, nest #1 was empty. On March 22, we found a new cliff nest (#2) with at least two 2.5-week old nestlings. The nest originally had been found in 1994 and designated as Blue Point #8, although it had never been used by bald eagles until this year.

*San Carlos.* – On January 10, we found nest #5 had fallen.

*Sheep.* – On January 10, we found that the nest #5 branch had fallen. On January 31, we found an adult bald eagle incubating in a new small cottonwood tree nest (#6).

*Silver Creek.* – On February 2 and February 6, AGFD personnel confirmed a report from the public of a new bald eagle nest in a live or partially live cottonwood in Snowflake, with two adults visiting the nest, and confirmed incubation on February 13. Due to the inactivity at nest #1, we considered this to be the Silver Creek pair in a new nest (#2).

*Sullivan Lake.* – On January 9, we found an adult bald eagle incubating in nest #2 which had been re-built after falling last year.
*Talkalai.* – On January 10, we found nest #7 had fallen, and saw one adult bald eagle in the area of a new nest (#8) in a live cottonwood tree. On January 31, an adult was incubating in nest #8.

*Tapco.* – On February 27, the USFS reported a bald eagle at a large nest downstream of nest #1 area. On March 16, we confirmed incubation in a new snag nest (#2).

*Woods Canyon Lake.* – Nests #1 and 2 were not found for the third consecutive year and were presumed fallen.

Table 7. 2012 Arizona bald eagle nest survey summary, breeding areas (continued next page).

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Bagley | 1/10, 1/31, 2/22, 3/22, 4/4, 4/26 | Helicopter, Ground | 1/10- Adult incubating in nest #2 (Blue Point #10). |
| Bartlett | 1/9, 1/18, 1/30, 2/14, 3/16 | Helicopter, Ground | All known nests empty. No bald eagles. |
| Becker | 3/12 | Helicopter | All known nests empty. No bald eagles. |
| Black Canyon (NV) | 4/16 | Helicopter | One adult in nest #1 with at least one 4.5-week old nestling in nest #1. Second adult in area. |
| Blue Point | 1/10, 1/31, 3/22, 4/4, 4/26 | Helicopter, Ground | 4/4- Confirmed taken over by adults from the Bagley BA. |
| Burro Creek | 1/30, 3/16 | Helicopter | No new nests or bald eagles. |
| Cedar Basin | 1/11, 1/31, 3/22 | Helicopter | 1/11- 1 adult in area. All known nests empty. |
| Coolidge | 1/10, 1/31, 3/22 | Helicopter | 1/10- One adult in area. All known nests empty. |
| Copper Basin (CA) | 4/16 | Helicopter | All known nests empty. No bald eagles. |
| Doka | 1/9, 1/30, 2/7, 2/9, 3/16, 4/5, 4/25 | Helicopter | 1/9- Nest #5 fallen. Adult incubating in new tree nest #6. |
| Dupont | 3/22 | Helicopter | All known nests empty. No bald eagles. |
| Ft. McDowell | 1/9, 1/30, 2/7, 2/17, 3/16 | Helicopter, Ground | 1/9- Two adults standing in new tree nest #18.<br>1/30- Adult incubating in nest #18. |
| Granite Basin | 1/10, 1/31, 3/22, 4/26 | Helicopter | 4/26- Two adults in area. |
| Granite Reef | 1/9, 1/30, 2/21, 3/16, 3/22, 4/13, 4/25 | Helicopter, Ground | 1/30- Adult incubating in new tree nest #5. |

Table 7 continued.

| Location | Date(s) | Survey Method | Results |
|---|---|---|---|
| Greer Lakes | 3/12, 3/22, 4/24 | Helicopter, Ground | 3/12- New snag nest #5 found. 4/24- One immature bald eagle. New active osprey nest #6 found. |
| Horseshoe | 1/9, 1/30, 2/21, 3/16 | Helicopter, Ground | 2/21- One adult observed in area. |
| Lone Pine | 1/11, 1/31, 3/22 | Helicopter | 1/11- Nest #5 fallen. |
| Lynx | 1/9, 1/30, 3/16, 4/25 | Helicopter | 1/9- Nest #3 re-built. 1/30- Adult incubating in nest #3. |
| Mohave | 4/16 | Helicopter | New cliff nests #2, 3, and 4. No bald eagles. |
| Needle Rock | 1/9, 1/30, 3/16 | Helicopter | 1/9- Nest #2 fallen. |
| Orme | 1/9, 1/30, 3/16, 4/10, 4/25 | Helicopter, Ground | 1/30- Adult incubating in new tree nest #7. |
| Pee Posh Wetlands | 1/9, 1/30, 2/10, 3/16, 3/21, 4/16 | Helicopter, Ground | 1/9- Adult incubating in new tree nest #3. 4/10- Arson fire destroyed nest #3, killed nestlings. 9/17- Built a new starter nest in the area. |
| Pinto | 1/10, 1/31, 3/6, 3/7, 3/22 | Helicopter | 1/10- New snag nest #8 found. 3/6- Adult incubating in nest #8. |
| Pleasant | 12/20, 1/30, 3/16 | Helicopter, Boat | 12/20- Two pairs in the area. |
| Rock Creek | 1/31, 3/22, 5/31 | Helicopter | All known nests empty. No bald eagles. |
| San Carlos | 1/10, 1/31, 2/23, 3/22, 4/26 | Helicopter, Ground | 1/10- Nest #5 fallen. |
| Saguaro | 1/10, 1/31, 2/22, 3/22, 4/4, 4/26, 5/10 | Helicopter, Ground | 3/22- At least two 2.5-week old nestlings in new cliff nest #2. |
| Sheep | 1/10, 1/31, 3/6, 3/22, 4/18, 4/19 | Helicopter, Ground | 1/10- Nest #5 fallen. 1/31- Adult incubating in new nest #6. |
| Silver Creek | 2/2, 2/6, 2/13, 3/12, 3/22, 4/23, 5/31 | Helicopter, Ground | 2/13- Adult incubating in new nest #2. Second adult in area. |
| Sullivan Lake | 1/9, 1/30, 3/16 | Helicopter | 1/9- Adult incubating in nest #2 (re-built). |
| Talkalai | 1/10, 1/31, 2/23, 3/22, 4/11, 4/26 | Helicopter, Ground | 1/10- Nest #7 fallen. One adult near new nest #8. 1/31- Adult incubating in nest #8. |
| Tapco | 1/9, 1/30, 2/11, 3/16, 4/2, 4/25 | Helicopter, Ground | 3/16- Adult incubating in new snag nest #2. |
| Tower | 1/9, 1/30, 2/11, 3/16 | Helicopter | All known nests empty. No bald eagles. |
| Woods Canyon Lake | 5/31 | Helicopter | Nests #1 and 2 not seen. |

## Overview

Significant findings of the 2012 nest survey include: 4 new bald eagle BAs, 12 new alternate bald eagle nests within BAs, 9 fallen or partially fallen nests within BAs, and 5 new potential nest sites. In 2012, we documented a record number of total BAs (Table 8).

One of the new bald eagle BAs was found in a neighborhood in Gilbert, AZ. Situated within the Phoenix Metropolitan Area, the BA habitat is atypical of nesting bald eagles in Arizona,

including the first documented use of a eucalyptus tree. The long-term viability of this BA is uncertain, but the act of nesting in such a situation demonstrates a significant level of behavioral tolerance to human activity by the breeding pair.

The second new BA this year was discovered on the Bill Williams Wildlife Refuge, which has been regularly searched and anticipated as a potential BA. It joins the Black Canyon (Nevada) and Mohave BAs as recent additions to the Colorado River system. The closest known BAs to the Refuge that have fledged young in recent years and which most likely served as the natal areas of this nesting pair are 10-30 miles distant (Copper Basin, Ive's Wash, Alamo).

The third and fourth new BAs were discovered at Show Low Lake and White Horse Lake. Both are higher-elevation coniferous forest sites, the latter of which we have regularly searched and anticipated as a potential BA. We expect to see the continuation of the establishment of new BAs at similar lakes along the Mogollon Rim, many of which are currently occupied only by ospreys.

The continued creation of new breeding areas and nests, and the loss of alternate nests, coupled with the potential for changes in the distribution of Arizona bald eagles further demonstrates the necessity and importance of ORA flights. These flights allow for the consistent monitoring of bald eagle demography, including population size, distribution, and reproductive success, in the rugged terrain of Arizona. Without the aid of these flights, we would not be able to accurately document these important population parameters.

Table 8. Arizona bald eagle 10-year productivity summary.

| | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 | 2004 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of BAs | 66 | 62 | 62 | 59 | 56 | 53 | 50 | 47 | 46 | 47 |
| Number of occupied BAs | 54 | 55 | 52 | 50 | 48 | 48 | 43 | 39 | 40 | 42 |
| Number of eggs (minimum) | 80 | 79 | 69 | 78 | 71 | 74 | 68 | 57 | 59 | 46 |
| Number of active BAs | 50 | 51 | 48 | 48 | 44 | 45 | 39 | 36 | 39 | 31 |
| Failed breeding attempts | 19 | 17 | 21 | 19 | 14 | 20 | 11 | 12 | 12 | 13 |
| Successful breeding attempts | 31 | 34 | 27 | 29 | 30 | 25 | 28 | 24 | 27 | 18 |
| Young hatched | 66 | 66 | 57 | 68 | 65 | 61 | 55 | 48 | 50 | 35 |
| Young fledged | 52 | 56 | 44 | 47 | 53 | 42 | 42 | 37 | 42 | 25 |
| Nest success | 0.57 | 0.62 | 0.52 | 0.58 | 0.63 | 0.52 | 0.65 | 0.62 | 0.67 | 0.43 |
| Mean brood size | 1.7 | 1.6 | 1.6 | 1.6 | 1.8 | 1.7 | 1.5 | 1.5 | 1.6 | 1.4 |
| Productivity | 0.96 | 1.0 | 0.85 | 0.94 | 1.10 | 0.87 | 0.98 | 0.95 | 1.05 | 0.6 |

## MANAGEMENT RECOMMENDATIONS

1. Future survey efforts should continue to monitor historical 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. Bald eagles banded in Arizona have been observed near or on El Novillo Reservoir, Sonora, Temecula Lake, California, and southwestern New Mexico, suggesting that the current distribution may extend into northern Mexico, southern California, and western New Mexico. Identifying breeding bald eagles through banding, visual identification, and transmitters would clarify the extent to which the bald eagles hatched in Arizona reach into these surrounding areas, and would help to accurately estimate survivorship.
3. Determine the identification of the breeding pair at Copper Basin, CA and yearly band the nestlings.
4. 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.
5. Examine the following areas for breeding bald eagles and/or nests:
   - Agua Fria River drainage – Up and downstream from Lake Pleasant.
   - Anderson Mesa Lakes – Ashurst Lake, Deep Lake, Horse Lake, Kinnikinick Lake, Long Lake, Marshall Lake, Potato Lake, Prim Lake, Tremaine Lake, Yaeger Lake.
   - Big Sandy River drainage.
   - Bill Williams River drainage – Bill Williams National Wildlife Refuge.
   - Black River drainage – Little and Big Bonito creeks to the confluence of the Black River, Paucity Creek, Pacheta Creek, Reservation Creek, and Osprey nesting areas on East and West Fork and main stem of the Black River.
   - Central and Eastern Mountain Lakes – Bear Canyon, Black Canyon, Blue Ridge, Chevelon Canyon, Cholla, Dry, JD Dam, Knoll, Lyman, Nash Creek, Pacheta, Point of Pines, Reservation, Rogers, Tonto, Willow Springs.
   - Colorado River drainage – Lake Havasu, Topock Marsh, Lake Mead (Grand Wash), Nankoweap Creek, Lee's Ferry.
   - North Fork of White River – Known osprey nesting locations.
   - Gila River drainage – Lower Blue River, San Francisco River to Gila River confluence, Gila Box.
   - Salt River Drainage – Redmond BA to Canyon BA, Cibecue BA to Cedar Basin BA, Tonto Creek north of Tonto BA, Pinto Creek, Salome Creek, Tanks Canyon, George's Basin.
   - Verde River drainage – Beaver Creek, East Verde River, Oak Creek, Sheep Creek, West Clear Creek.
   - White Mountain Lakes – Carnero, Christmas Tree, Horseshoe Cienega, Hawley, Lee Valley Reservoir, Nelson Reservoir, Nutrioso, Pacheta, Reservation.
   - White River – Whiteriver to confluence with Black and Salt rivers.

## 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. In 1991, the USFWS transferred the lead to the AGFD after passage of the Heritage Initiative, a voter initiative creating a fund from Arizona Lottery proceeds for wildlife and natural areas conservation.

To address the continuing management needs for Arizona's breeding bald eagles, the ABENWP operates under 3 goals: conservation, data collection, and education. 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. Possibly the most tangible benefit of the ABENWP is determining when the bald eagles are in life threatening situations. Daily monitoring allows biologists to intervene in these situations, and eliminate or reduce the threat.

In this report, we summarize significant discoveries at each BA monitored by the ABENWP in 2012. Detailed reports of each monitored BA are centralized at AGFD, and distributed to the appropriate land and wildlife management agencies.

## METHODS

We selected the BAs to be monitored by weighing the level of recreation activity and management needs. Included are those with seasonal closures (Box Bar, Cliff, Crescent, Goldfield-Kerr, Ladders, Luna, Pinto, Show Low, Tonto, and Woods Canyon), those without (Orme, Rodeo, Sycamore), and those monitored opportunistically for information (Doka, Fort McDowell, Granite Reef, Sheep). In the fall of 2011, 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 the pool of applicants.

We held two orientation meetings, and three question and answer sessions for the selected ABENWP contractors. The two 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, the contractors 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 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.

Fieldwork began February 3, 2012 and continued until nestlings fledged. Teams of two nestwatchers maintained a 10 days on/4 days off schedule. During each work period, weekend

observations were conducted from dawn-to-dusk to cover times of high recreation use and 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 recreation use 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 the primary OP view. Nestwatchers were provided spotting scopes, Motorola® radios, cellular telephones, and/or USFS radios for viewing and communication needs. We supplied BA maps with river and/or lake kilometer (rk/lk) designations, and a guide to commonly taken fish species. They recorded all bald eagle data on supplied forms. Nestwatchers provided their own transportation, gas, field supplies, binoculars, and housing on days off.
Within an arbitrary 1.0 km (3,300 ft) radius of a bald eagle or active nest, nestwatchers recorded all human activity and the associated bald eagle behavior. Aircraft flying below the 2000 foot FAA advisory over bald eagle breeding areas were also recorded. Nestwatchers classified bald eagle behavior in response to human activity into 7 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 away. Nestwatchers recorded "bird not in area" if a bald eagle was not present, and an "unknown" response if the bald eagle 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 Orme and Woods Canyon BAs, nestwatchers recorded human activity differently than described above. At Orme, activities at the USFS Phon D. Sutton Recreation Area were not recorded unless the activity continued across the river onto the SRPMIC land. At the Woods Canyon BA, due to the high volume of recreationists at the lake nestwatchers only recorded eagle behavioral responses to violations of the nest area closure and activities within 25m of an eagle.

Nestwatchers documented all aspects of 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 18 breeding areas in 2012 including Box Bar, Cliff, Crescent, Doka, Fort McDowell, Goldfield-Kerr, Granite Reef, Ladders, Luna, Orme, Pinto, Pleasant, Rodeo, Sheep, Show Low Lake, Sycamore, Tonto, and Woods Canyon. The final status of the monitored BAs was 7 failed, 10 successful, 1 occupied, and 16 young fledged (Appendix C).

The Doka, Fort McDowell, Granite Reef, and Sheep BAs were opportunistically monitored by nestwatchers at nearby BAs. The Pleasant BA failed early and Ladders BA did not become active, and these nestwatchers were moved to other sites. Therefore, data for these six BAs are not included in the following section of this report.

Box Bar Breeding Area (Appendix E)
*Observation Period.* – February 3 to May 6. Total monitoring 60 days/503 hours.

*Bald Eagle Identification.* – The male was unbanded and in adult plumage (unknown origin). The female was unbanded and in adult plumage (unknown origin).
*Management Activities.* – 1) The USFS enacted the seasonal BA closure. 2) The owners of Rio Verde Ranch allowed ABENWP contractors to camp and monitor from their lawn. 3) ABENWP contractors were active in educating the public visiting the Rio Verde Ranch and users of the USFS lands south of the ranch.

*Human Activity.* – Nestwatchers recorded 49 human activities. Terrestrial activity of 5 types represented 81.6%, and aircraft activity represented 18.4%. Six types of activities elicited 8 significant responses from the breeding pair. The bald eagles were restless in response to 2 off-highway vehicles (OHVs), and 1 helicopter, horseback rider, and vehicle driving in river each. The eagles flushed in response to 1 OHV and 1 hunter.

*Food Habits*. – Nestwatchers observed 5 forage events. The male was successful in 100% (n=1), and the female in 100% (n=4) of events. The breeding pair was observed delivering 31 prey items to the nest, of which the male delivered 67.7% and the female 32.3%. Fish comprised 67.7% (n=21) of the deliveries and unknown prey types 32.3% (n=10). Of the 2 prey items further identified, one was a largemouth bass (*Micropterus salmoides*) and one was a catfish (unidentified species).

*Figure 2. Box Bar breeding area. Maricopa County, Arizona. Photo by J. Driscoll.*

*Habitat Use.* – The Box Bar nestwatchers identified 14 separate perch locations, spanning a 2.8 km stretch of the Verde River ranging from rk 23.9 to 26.7. The bald eagle pair spent 35.9% of the observed time at river kilometer (rk) 25.3, 18.0% at rk 25.4, 14.7% at rk 25.5, 8.0% at rk 25.2, 5.0% at rk 24.9, and 18.3% at the remaining locations.

Cliff Breeding Area (Appendix F)
*Observation Period.* – February 3 to June 3. Total monitoring 86 days/870 hours.

*Bald Eagle Identification.* – The male was unbanded and in adult plumage (unknown origin). The female had a blue VID band "19/R" on her left leg, USFWS band on the right leg, and was in adult plumage (2006 Granite Reef nestling).

*Management Activities.* – 1) The USFS enacted the seasonal BA closure. 2) The USFS maintained "Sensitive Species Area" signs around the nest area, as well as markers, posts, and natural barriers to prevent off-road traffic and to keep people on existing roads.

*Human Activity.* – Nestwatchers recorded 36 human activities during the monitoring period. Aircraft (helicopters, small planes, and jets) accounted for 55.6% and terrestrial activities of 6 different types for 44.4%. Three types of activities elicited 4 significant responses from the breeding pair. The bald eagles were restless in response to 2 helicopters and 1 small plane, and flushed in response to 1 OHV.

*Food Habits*. – Nestwatchers observed 9 forage events. The male was successful in 100% (n=4), and the female in 100% (n=5) of events. Fish accounted for 88.9% (n=8) and mammals for 11.1% (n=1) of these events. The breeding pair was observed delivering 51 prey items to the nest, of which the male delivered 62.7%, the female 33.3%, and an unidentified adult 3.9%. Fish comprised 80.4% (n=41) of the deliveries, mammals and reptiles each for 5.9% (n=3), birds for 2.0% (n=1), and unknown prey types 5.9% (n=3). Of the 8 prey items further identified, 22.2% (n=2) each were common carp (*Cyprinus carpio*) and ground squirrel (unidentified species), and 12.5% (n=1) each were largemouth bass, channel catfish (*Ictalurus punctatus*), rock squirrel (*Spermophilus variegatus*), and red-eared slider (*Trachemys scripta elegans*).

*Figure 3. Cliff breeding area. Maricopa County, Arizona. Photo by K. McCarty.*

*Habitat Use.* – The Cliff nestwatchers identified 12 separate habitat use areas, spanning a 2.7 km stretch of the Verde River ranging from rk 66.5 to 69.2. The bald eagle pair spent 35.2% of the observed time at river kilometer (rk) 66.6, 31.9% at rk 66.7, 14.5% at rk 67.7, 6.2% at rk 67.1, 5.1% at rk 66.8, 4.1% at rk 66.5, and 2.9% at the remaining locations.

Crescent Breeding Area (Appendix G)
*Observation Period.* – April 4 to May 6. Total monitoring 30 days/234 hours.

*Figure 4. Crescent breeding area. Apache County, Arizona. Photo by K. McCarty.*

*Bald Eagle Identification.* – Both adults were in adult plumage, but their identification and band status were undetermined.

*Management Activities.* – 1) The USFS posted "No Entry" signs surrounding the nest area knoll. 2) The USFS maintained a bald eagle information board along the west access road.

*Human Activity.* – Nestwatchers recorded 114 human activities during the monitoring period. Terrestrial activity of 5 different types represented 73.7%, water pursuits (boaters, float tubers, and kayaks/canoes) 25.4%, and aircraft (small planes) 0.9%. No significant responses to any activities were observed from the breeding pair.

*Food Habits*. – The nestwatchers observed 8 forage events. The male was successful in 83.3% (n=6) and the female in 100% (n=2). Of these forage attempts, 75% were for fish and 25% birds. The breeding pair was observed taking 5 prey items to the nest during incubation, of which the male delivered 80% and the female 20%. Rainbow trout (*Oncorhynchus mykiss*) comprised 100% (n=5) of those items.

*Habitat Use.* – The Crescent nestwatchers identified 10 perch locations around Crescent Lake. The bald eagle pair spent 48.4% of the observed time at lake kilometer (lk) 2.2, 28.7% at lk 2.3, 8.9% at lk 2.4, and 7.3% at lk 2.1, 4.5% at lk 2.5, and 2.2% at the remaining locations.

Goldfield-Kerr Breeding Area (Appendix H)
*Observation Period*. – February 3 to March 25. Total monitoring 39 days/364 hours.

*Bald Eagle Identification.* – The female had no bands and was in adult plumage (unknown origin).The male had a blue VID band "19/D" on his left leg, USFWS band on the right leg, and was in adult plumage (2006 Needle Rock nestling).

*Management Activities.* – 1) The USFS closed off vehicle access to the nest area. 2) The USFS posted wildlife breeding area signs along the river prohibiting entry.

*Human Activity.* – Nestwatchers recorded 421 human activities during the observation period. Terrestrial activity of 4 different types represented 42.7%, aircraft (helicopters, small planes, jets) 30.4%, and watercraft 26.8%. Two types of activities elicited 46 significant responses from

the breeding pair. The bald eagles flushed in response to 1 hiker and 2 gunshots, and were restless in response to 43 gunshots.

*Food Habits*. – Nestwatchers observed 9 forage events. The male was successful in 50.0% (n=2) and the female in 42.9% (n=7). Fish accounted for 55.6% and unknown prey types 44.4% of these events. The breeding pair was observed delivering 25 prey items to the nest, of which the male delivered 40.0%, the female 40.0%, and an unidentified adult 20%. Fish comprised 48.0% (n=12) of these deliveries, mammals and birds each 8.0% (n=2), and unknown prey types 36.0% (n=9). Of the 4 prey items further identified, 25.0% (n=1) each were suckers (unidentified species), ground squirrel (unidentified species), rabbit (unidentified species), and American coot (*Fulica americana*).

*Figure 5. Goldfield-Kerr breeding area. Maricopa County, Arizona. Photo by K. McCarty.*

*Habitat Use.* – The Goldfield-Kerr nestwatchers identified 16 perch locations, spanning a 3.2 km stretch of the Salt River ranging from river kilometer (rk) 9.2 to rk 12.4. The bald eagle pair spent 77.5% of the observed time at rk 10.2, 20.9% at rk 10.1, and 1.7% at the remaining locations.

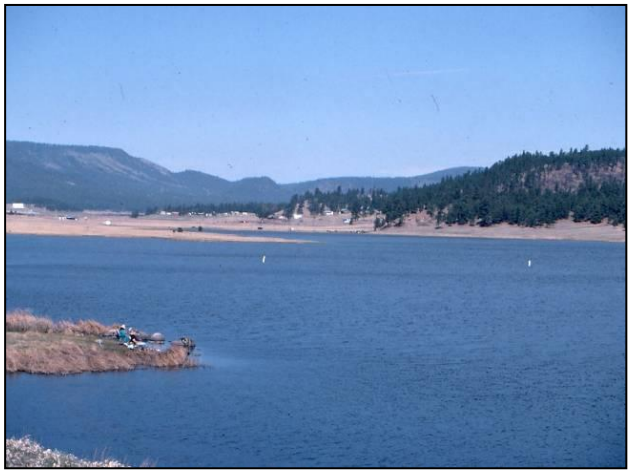
Luna Breeding Area (Appendix I)
*Observation Period*. – May 11 to July 12. Total monitoring 50 days/514.5hours.

*Bald Eagle Identification* – The male was in adult plumage (band status unknown). The female had a black VID band "Δ/B" on her right leg, USFWS band on the left leg, and was in adult plumage (unknown origin; trapped as an unbanded adult at Luna Lake in 1994).

*Management Activities*. – 1) The USFS enacted the seasonal BA closure. 2) Nestwatchers were stationed at the boat ramp to talk to anglers launching boats. 3) One female nestling was blue VID banded "28/E" at 5 weeks of age on May 8.

*Human Activity.* – The nestwatchers recorded 1,285 human activities. Terrestrial activity of 13 different types accounted for 73.6%, water pursuits (boats, canoes/kayaks, float tubers, and swimmers) for 25.7%, and aircraft (helicopters, military jets, and small planes) 0.7%. Three types of activities elicited 7 significant responses from the breeding pair. The bald eagles were restless in response to 2 agency workers and 1 driver, flushed in response to 1 helicopter, and left the area in response to 3 agency workers.

*Food Habits*. – The nestwatchers observed 67 forage events. The male was successful in 95% (n=40) and the female was successful in 88.9% (n=27) of forage events. Fish accounted for 59.7% (n=40), birds 37.3% (n=25), and carrion 3.0% (n=2) of these events. The breeding pair was observed delivering 59 prey items to the nest, of which the male delivered 64.4% (n=38) and the female 35.6% (n=21). Fish comprised 64.4% (n=38) of the deliveries, birds 28.8% (n=19), and mammals 3.4% (n=2). Of the 59 prey items further identified, 64.4% (n=38) were rainbow trout, 28.8% were American coots (n=17), and 3.4% (n=2) each were Canada goose (*Branta canadensis*) goslings and rabbits (unidentified species).



*Habitat Use*. – The Luna nestwatchers identified 22 separate habitat use areas around Luna Lake. The bald eagle pair spent 58.8% of the observed time at lake kilometer (lk) 2.4, 19.9% at lk 2.7, 8.1% at lk 2.6, 5.7% at lk 2.2, and 7.4% at the remaining locations.

*Figure 6. Luna breeding area. Apache County, Arizona. Photo by J. Driscoll.*

Orme Breeding Area (Appendix J)
*Observation Period*. – February 3 to May 20. Total monitoring 80 days/798 hours.

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

*Management Activities*. – 1) The SRPMIC continues to restrict non-tribal member use of the river area. 2) The SRPMIC police routinely visited the ABENWP contractors and patrolled the nesting area during times of elevated recreation use. 3) On April 10, one female and one male nestling were blue VID banded “27/U” and “27/V” at 5.5 weeks of age.

*Figure 7. Orme breeding area. Maricopa County, Arizona. Photo by K. McCarty*

*Human Activity* – Nestwatchers recorded 526 human activities. Terrestrial activities of 16 different types represented 62.4%, aircraft (helicopters, small planes, motorized parachutes) 36.5%, and water activities (canoe/kayak, swimmer) 1.1%. Thirteen types of activities elicited 21 significant responses by the breeding pair. The bald eagles were restless in response to 2 AGFD personnel, 2 helicopters, and 1 driver. They flushed in response to 2 hikers, gunshots, swimmers, and drivers each, and once each to a helicopter, agency worker, fisherman, small

plane, photographer, dog (rancher), and picnicker. They left the area in response to 1 AGFD worker.

*Food Habits*. – Nestwatchers observed 8 forage events. The male was successful in 25.0% (n=4), the female in 100% (n=1), and an unknown adult in 33.3% (n=3). Unknown prey types accounted for 100% of these events. The breeding pair was observed delivering 21 prey items to the nest, of which the male delivered 57.1% and the female 42.9%. Fish comprised 33.3% (n=7) of these deliveries, mammals birds 4.8% (n=1), and unknown prey types 61.9% (n=13). Of the 7 prey items further identified, 42.9% (n=3) were catfish (unidentified species), and 28.6% (n=2) each were suckers (unidentified species) and rainbow trout**.**

*Habitat Use*. – The Orme nestwatchers identified 36 habitat use locations along the Verde and Salt Rivers, spanning a total of 5.6 km ranging from river kilometer (rk) 0.4 to 1.0 on the Verde River and rk 4.8 to 9.8 on the Salt River. The bald eagle pair spent 59.1% of the observed time at rk 0.7 (Verde River), 23.5% at rk 0.6 (Verde River), 10.3% at rk 0.9 (Verde River), and 7.1% at the remaining locations.

Pinto Breeding Area (Appendix K)
*Observation Period*. – February 17 to April 4. Total monitoring 35 days/320 hours.

*Bald Eagle Identification.* – The male had a blue VID band on the left leg, USFWS band on the right leg, and was in adult plumage (unknown origin, but blue band indicative of an Arizona nestling). The female was unbanded and in adult plumage (unknown origin).

*Management Activities*. – 1) The USFS enacted the seasonal bald eagle closure. 2) The Southwestern Willow Flycatcher Closure limited recreational activities on the west side of the Salt River.

*Figure 8. Pinto breeding area. Gila County, Arizona. Photo by K. McCarty.*

*Human Activity.* – Nestwatchers recorded 50 human activities. Terrestrial activities of 8 types represented 64.0%, aircraft 30.0%, and watercraft (boat, canoe) 6.0%. Three types of activities elicited 4 significant responses from the breeding pair. The bald eagles flushed in response to 1 agency worker and 1 AGFD researcher, and left the area in response to 1 helicopter and AGFD researcher each.

*Food Habits.* – The nestwatchers observed 2 forage events by the breeding pair, with the male and female each successful in 100% (n=1). Fish accounted for 50% (n=1) and reptiles 50% (n=1) of these events. The breeding pair was observed delivering 3 prey items to the nest, of which the male delivered 33.3% and the female 66.7%. Fish comprised 66.7% (n=2) and reptiles 33.3% (n=1) of the deliveries.

*Habitat Use.* – The Pinto nestwatchers identified 30 separate habitat use areas along the Salt River, spanning 5.2 km and ranging from river kilometer (rk) 99.9 to 105.1. The bald eagle pair spent 47.1% of the observed time at rk 104.4, 24.0% at rk 104.5, 14.5% at rk 104.6, and 14.5% the remaining locations.

Rodeo Breeding Area (Appendix L)
*Observation Period.* – February 24 to May 20. Total monitoring 64 days/480 hours.

*Bald Eagle Identification.* – The female had no bands and was in adult plumage (unknown origin). The male had a blue VID band on his left leg, USFWS band on the right leg, and was in adult plumage (unknown origin, but blue band indicative of an Arizona nestling).

*Management Activities.* – 1) The FMYN continues to restrict non-tribal member use of the river area.

*Human Activity*. – Nestwatchers recorded 2,478 human activities. Terrestrial activities of 5 types accounted for 96.1% and aircraft (helicopters and small planes) for 3.9%. Two types of activities elicited 2 significant responses from the breeding pair. The bald eagles flushed from a perch in response to 1 driver and left the area in response to 1 helicopter.

*Figure 9. Rodeo breeding area. Maricopa County, Arizona. Photo by Arizona Game and Fish Department.*

*Food Habits*. – The nestwatchers observed 1 forage event. The female was successful in 0% (n=1; unknown prey type) of events and the male was not seen foraging. The breeding pair was observed delivering 49 prey items to the nest, of which the male delivered 46.9%, and the female 53.1%. Fish comprised 87.8% (n=43) of delivered items and carrion 12.2% (n=6). Of the 15 prey items further identified, 53.3% (n=8) were common carp and 46.7% (n=7) were suckers (unidentified species).

*Habitat use*. – The Rodeo nestwatchers identified 13 perch locations along the Verde River, spanning a total of 1.7 km and ranging from river kilometer (rk) 2.5 to 4.2. The bald eagle pair spent 75.6% of the observed time at rk 3.8, 18.2% at rk 4.2, 4.7% at rk 2.5, and 1.5% at the remaining locations.

Show Low Lake Breeding Area (Appendix M)
*Observation Period.* – April 4 to May 2. Total monitoring 20 days/183 hours.

*Bald Eagle Identification.* – The male had a blue VID band on the left leg, USFWS band on the right leg, and was in adult plumage (unknown origin, but blue band indicative of an Arizona nestling). The female was unbanded and in adult plumage (unknown origin).

*Management Activities.* – 1) AGFD and USFS established water and land closures around the nest site.

*Human Activity*. – Nestwatchers recorded 373 human activities. Terrestrial activities of 8 types represented 71.8%, water activities of 5 types 27.3%, and aircraft (helicopters) 0.8%. One type of activity elicited 1 significant response from the breeding pair. The bald eagles flushed in response to 1 hiker.

*Figure 10. Show Low Lake breeding area. Navajo County, Arizona. Photo by K. McCarty.*

*Food Habits*. – The breeding pair was observed delivering 3 prey items to the nest. Fish comprised 33.3% (n=1) of these deliveries and unknown prey types 66.7% (n=3).

*Habitat use*. – The Show Low Lake nestwatchers identified 13 separate habitat use areas around the lake. The bald eagle pair spent 32.3% of the observed time at lake kilometer (lk) 2.3, 25.2% at lk 2.5, 19.1% at lk 1.6, 16.5% at lk 2.4, 5.2% at lk 2.45, and 1.8% at lk 2.2.

Sycamore Breeding Area (Appendix N)
*Observation Period.* – February 3 to April 30. Total monitoring 60 days/556 hours.

*Bald Eagle Identification.* – The band status of the male was reported by nestwatchers as blue VID band on the left leg, USFWS band on the right leg, and in adult plumage (unknown origin, but blue band indicative of an Arizona nestling). The female was reported as unbanded and in adult plumage (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.

*Figure 11. Sycamore breeding area. Maricopa County, Arizona. Photo by Arizona Game & Fish Department.*

*Human Activity*. – Nestwatchers recorded 262 human activities. Terrestrial activities of 6 types represented 75.2% and aircraft (helicopters, small planes) 24.8%. Two types of activities elicited 2 significant responses from the breeding pair. The bald eagles flushed in response to 1 OHV, and left the area in response to 1 helicopter.

*Food Habits*. – Nestwatchers observed 2 forage events. The male and female each were successful in 100% (n=1). Fish and birds each accounted for 50% of these events. The breeding pair was observed delivering 66 prey items to the nest, of which the male delivered 65.2%, and the female 34.8%. Fish comprised 51.5% (n=34) of these deliveries, mammals 12.1% (n=8), birds 4.6% (n=3), and unknown prey types 31.8% (n=21). Of the 11 prey items further identified, 27.2% (n=3) were rainbow trout, 18.2% (n=2) each were suckers (unidentified species), common carp, and jackrabbit (unidentified species), and 9.1% (n=1) each were ground squirrel (unidentified species) and gadwall (*Anas strepera*).

*Habitat use*. – The Sycamore nestwatchers identified 12 separate habitat use areas, spanning a total of 4.2 km along the Verde River ranging from river kilometer (rk) 7.6 to 11.8, and 0.6 km along Sycamore Creek ranging from rk 0.4 to 1.0. The bald eagle pair spent 94.0% of the observed time at rk 10.4 (Verde River), 4.3% at rk 9.5 (Verde River), and 1.7% at the remaining locations.

Tonto Breeding Area (Appendix O)
*Observation Period.* – February 3 to May 20. Total monitoring 80 days/661 hours.

*Bald Eagle Identification.* – The male had a blue VID band "14/E" on the left leg, USFWS band on the right leg, and was in adult plumage (2002 Talkalai nestling). The female had a blue VID band "G" on the left leg, USFWS band on the right leg, and was in adult plumage (1987 Horseshoe nestling).

*Management Activities.* – 1) A portion of the Indian Point campground remained closed throughout the breeding season. 2) The Southwestern Willow Flycatcher Closure limited recreational activities in the area. 3) The USFS enacted the seasonal bald eagle closure.

*Human Activity*. – Nestwatchers recorded 118 human activities. Terrestrial activities of 9 types represented 86.4% and aircraft (helicopters, small planes) 13.6%. One type of activity elicited 2 significant responses from the breeding pair. The bald eagles were restless in response to 1 hiker, and flushed from a perch in response to 1 hiker.

*Figure 12. Tonto breeding area. Gila County, Arizona. Photo by K. McCarty.*

*Food Habits*. – The nestwatchers observed 20 forage events. The male was successful in 71.4% (n=14) and the female in 100% (n=6). Fish accounted for 75.0% (n=15), birds 20.0% (n=4), and unknown prey types 5.0% (n=1) of forage events. The breeding pair was observed delivering 68 prey items to the nest, of which the male delivered 73.5% and the female 26.5%. Fish comprised 95.6% (n=65), mammals 2.9% (n=2), and unknown prey types 1.5% (n=1) of delivered items. Of the 38 prey items further identified, 36.8% (n=14) were channel catfish, 23.7% (n=9) were black crappie (*Pomoxis nigromaculatus*), 15.8% (n=6) were largemouth bass, 10.5% (n=4) were common carp, 7.9% (n=3) were smallmouth bass (*Micropterus dolomieu*), and 5.3% (n=2) were flathead catfish (*Pylodictis olivaris*).

*Habitat use*. – The Tonto nestwatchers identified 17 separate perch locations along Tonto Creek, spanning 4.3 km and ranging from river kilometer (rk) 13.0 to 17.3. The bald eagle pair spent 76.3% of the observed time at rk 16.9, 10.7% at rk 16.7, 7.1% at rk 16.3, and 5.9% at the remaining locations.

Woods Canyon Breeding Area (Appendix P)
*Observation Period*. – April 13 to August 26. Total monitoring 107 days/747 hours.

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

*Management Activities*. – 1) The Black Mesa Ranger District established a closure around the nest area, including re-routing the lake trail, and placed closure signs. 2) AGFD established a water closure around the nest site. 3) Nestwatchers were supplied a boat by AGFD and educated recreationists about the closure and bald eagles.

*Human Activity*. – Nestwatchers recorded 40 human activities within 25 meters of a resident eagle. Terrestrial activities (hiker, fisherman, photographer, birdwatcher) accounted for 77.5% and watercraft (boats, canoes/kayaks, fishing tubers) for 22.5%. Two types of activities elicited 3 significant responses from the breeding pair. The bald eagles flushed in response to 2 hikers and 1 boat. Activities more than 25 meters from an eagle were not seen to cause a significant reaction.

*Figure 13. Woods Canyon breeding area. Coconino County, Arizona. Photo by K. McCarty. .*

*Food Habits*. – The nestwatchers observed 52 forage events. The male was successful in 50% (n=28), the female in 77.3% (n=22), and an unknown adult in 50% (n=2) of events. Fish accounted for 100% of forages. The breeding pair was observed delivering 85 prey items to the

nest, of which the male delivered 54.1% and the female 45.9%. Fish comprised 100% of delivered items.

*Habitat Use.* – The Woods Canyon nestwatchers identified 66 separate habitat use areas around the lake. The bald eagle pair spent 14.8% of the observed time at lake kilometer (lk) 5.0, 13.3% at lk 1.1, 10.4% at lk 4.8, 6.5% at lk 4.7, 5.7% at lk 1.8, 5.5% at lk 3.5, 5.0 at lk 3.8, and 39.0% at the remaining locations.

## 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 AGFD. We have included them as informational material for land and wildlife management agencies reviewing this report, and for further discussion at SWBEMC meetings.

### Box Bar Breeding Area

1. Consider setting up cameras to document equestrian riders violating the closure area and use it as evidence against them in a court of law, or impose larger fines, or increase law enforcement presence.

### Cliff Breeding Area

1. Develop closure signage that more clearly informs recreationists that entry is prohibited. While it is the opinion of the nestwatchers that most fisherman knew they were not supposed to be within the closure, an often-heard excuse was that the signs were not explicit enough, and they thought it was okay as long as they were careful and quiet.
2. Signing along the north Horseshoe Dam Road at likely access points is highly recommended. During the spring hunting season, hunters occasionally entered the closure via this route, which is not signed where they enter from the road.

### Crescent Breeding Area

1. Implement a conscientious supplementation of food (fish or elk) for this pair, if only through the tough times of February and March.

### Goldfield

No management recommendations were provided.

### Luna Breeding Area

1. Reinstate the nestwatch program at Luna Lake. The community wants us there as well.
2. Maintain closure boundaries as they are, including Group Campsite A.
3. Consider creating "islands" isolated from shore by cutting off ends of peninsulas. These "islands" will enhance breeding areas for resident waterfowl and improve survival rates for their chicks.
4. Developing a presentation for new staff at the Alpine Ranger office may orient new personnel to the bald eagle program and result in a strong "buy in" for the program.

Orme & Granite Reef Breeding Areas

1. Clearly define and sign the closure area by using T-posts spaced at regular intervals and inexpensive laminated signs attached to them. A boundary marking system such as this could be easily erected and dismantled on a seasonal basis.
2. Close Pole 4 Road seasonally. In 2012, the barriers and signs on this road were sometimes ignored or moved aside. A locked access could exclude recreationists but allow key-holders on official business. During the nesting season, community member access to the river could be provided via the track east of the water plant.
3. Provide the SRPMIC Police Officers and Dispatch with a map that includes the locations of the Orme and Granite Reef nests, the nestwatchers' primary observation point, camp, and numbered poles, as well as the nestwatchers' cell phone numbers. The nestwatchers had a much better view of the area than law enforcement and good cell phone communication with the Salt River Rangers, but not with the Salt River Patrol Police (except through Dispatch). This made communication in the field difficult.
4. Develop a Standard Operating Procedure (SOP), developed by law enforcement, natural resources, and the SWBEMC, for operating within the Wildlife Closure Area. Provide a short seminar about the SOP to brief the police about the basics of bald eagle biology and management (see 2012 Orme Nestwatch Report for more details).
5. Place notification signs (similar to existing signs) on all roads leading to the closure boundary. Add signage and a clearly marked closure perimeter on the east side of the Verde River. Repair the "No Trespassing" sign at the river confluence. This should inform people straying up the Verde River from the Phon D Sutton Recreation Area that they will violate a wildlife closure area if they proceed.
6. Close, but do not lock, the north gate to the Red Mountain Preserve. This would allow community members and staff to enter and leave freely by closing the gate behind them, but stop other vehicular traffic from entering the Red Mountain Preserve, much of which is confused tourists looking for the casino.
7. Inform Unity Run attendees that they should not enter the Wildlife Closure Area.
8. Install monofilament fishing line recycle bins at recreation areas contiguous with the Orme Breeding Area.
9. We recommend that anyone wishing to observe the eagles at the immediate closure boundary stay inside their vehicle, which would be less of a disturbance than getting out to look. Direct people to the nestwatch observation point and/or schedule educational visits through the SRPMIC Community Development Department (e.g., school groups).

Pinto Breeding Area

1. If the road leading to the west side of the Salt River to the southwest portion of the breeding area is going to be open in the future, place some informational signs about the eagles either in the parking area or on the shoreline. This may help to curb recreational shooters from firing into and across the river toward the breeding area where they may accidentally harm a person, eagle, or other wildlife.

Rodeo Breeding Area

1. Deliver educational information to local airports and military bases prior to the nesting season requesting their assistance in protecting the nest areas. Request that liaisons from

the military bases be assigned to AGFD so that incidences may be reported and prevented in a more efficient manner. Also request that they annually brief their pilots on the areas of concern and proper procedures in these sensitive areas.

2. Place a sign stating that only emergency stopping is permitted, on the highway bridge near the spot where people like to stop to take pictures of the perched eagles. Place pamphlets near the sign containing information about the eagles and the importance of not flushing them.
3. Place monofilament recovery containers at intervals on both sides of the river near the bridge and in high use areas. A volunteer from the area or local fishing group could be recruited for regular maintenance and monofilament removal.

Show Low Lake Breeding Area

1. Continue to post signs and implement a buoy line around the nest tree. Hikers flushed the bird when they approached the tree and this space was crucial to the nesting attempt. All hikers approached from the trail that runs north-south under the nest.

Sycamore Breeding Area

1. Distribution of information about the Arizona Bald Eagle Nestwatch Program and FMYN Environmental Department could be increased and improved by means of a portable, weather-resistant display rack.
2. Post additional FMYN signs within the Sycamore Creek bed where they can be easily seen by OHV riders. Last year the presence of signs near the jeep road crossing (at creek km 1.3) may have helped minimize OHV traffic driving down the creek to the Verde River. In 2012, the tribal signs remained but the eagle-specific ones created by tribal members were not there and vehicle numbers doubled.
3. Due to the easy access to the gravel bar in the vicinity of the Fort McDowell nest, we recommend that FMYN and eagle breeding area signs be posted on jeep roads along the western bank of the Verde River if the pair utilizes nest #18 in future breeding seasons.

Tonto Breeding Area

1. Continue signage for no access by motor vehicles along the A Cross road access. The signage density at this access point seems to have been effective in keeping violations to a minimum.
2. Continue dawn to dusk observations from the OP and boat during weekends and holidays.

Woods Canyon Breeding Area

1. Post a special bulletin suggesting fishermen remove all hooks from the fish they release and include an explanation on how these hooks, attached or discarded fishing line, and lead sinkers are detrimental to the bald eagles and other wildlife.
2. Create a presentation for public display at Woods Canyon with photos from Liberty Wildlife depicting the harm to wildlife caused by improper disposal of fishing line, hooks and lead sinkers. This may help educate fishermen on the consequences of improper disposal of fishing tackle.

3. Notify the AGFD employees that set up the closure buoys each season to place them as close to the shore as possible. This year the buoys were more than 10m off shore and nestwatchers had a very difficult time adjusting the anchoring ropes and moving them close to the shore line. Nestwatchers do not enforce a water closure. Only boaters stepping onto land are warned but the buoys do a good job of informing the boaters about the closure.

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## APPENDIX A: 2012 ARIZONA BALD EAGLE WINTER COUNT RESULTS

Table 9. 2012 Arizona bald eagle winter count volunteer survey results (continued next page).

| Route Number | Route Name | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagle | Unknown Eagle |
|---|---|---|---|---|---|---|
| **Apache County** | | | | | | |
| 1 | Becker Lake | 15 | 2 | 2 | 0 | 2 |
| 2 | Little Colorado River (LCR) | 15 | 2 | 0 | 0 | 0 |
| 3 | S. Fork LCR – Campground | 15 | 0 | 0 | 0 | 0 |
| 4 | Casa Malapais – LCR | 15 | 0 | 0 | 0 | 0 |
| 5 | Greer Lakes (River, Bunch, and Tunnel Reservoirs) | 60 | 0 | 0 | 0 | 0 |
| 6 | Sponseller Lake | 30 | 0 | 0 | 0 | 0 |
| 7 | Mexican Hay Lake | 40 | 0 | 0 | 0 | 0 |
| 8 | White Mountain Hereford Ranch (Trinity, Glen Livet, McKay reservoirs) | 60 | 3 | 0 | 0 | 0 |
| 9 | The Ranch Lake | 20 | 0 | 0 | 0 | 0 |
| 10 | Ortega Lake | 80 | 0 | 0 | 0 | 0 |
| 11 | Concho Lake | 45 | 1 | 0 | 0 | 0 |
| 12 | Luna Lake | 15 | 2 | 0 | 0 | 0 |
| 13 | Nelson Reservoir | 45 | 1 | 0 | 0 | 0 |
| 14 | Nutrioso Reservoir | 120 | 1 | 1 | 0 | 0 |
| 16 | San Francisco River (Luna Lake to New Mexico line) | 120 | 0 | 0 | 0 | 0 |
| **Total** | | **695** | **12** | **3** | **0** | **2** |
| **Cochise County** | | | | | | |
| 18 | Parker Canyon Lake[1] | 105 | 0 | 0 | 0 | 0 |
| 19 | Willcox Playa | 190 | 0 | 0 | 0 | 0 |
| **Total** | | **295** | **0** | **0** | **0** | **0** |
| **Coconino County** | | | | | | |
| 21 | Long Lake Complex | 125 | 1 | 2 | 0 | 0 |
| 22 | Stoneman Lake | 260 | 5 | 8 | 0 | 0 |
| 23 | FH-3 | 90 | 0 | 0 | 0 | 0 |
| 24 | I-17, Section to Flagstaff | 278 | 10 | 7 | 1 | 1 |
| 25 | Bellemont | 230 | 0 | 0 | 0 | 0 |
| 26 | Townsend/Winona A/B | 549 | 2 | 0 | 0 | 0 |
| 27 | HWY 89 North /Sunset Crater – Wupatki | 396 | 1 | 0 | 0 | 0 |
| 28 | FH-3 Lakes (Mary, Mormon, Marshall, Prime, etc.) | 510 | 10 | 0 | 0 | 0 |
| 29 | Continental Country Club Lakes | 120 | 0 | 0 | 0 | 0 |
| 30 | Chevelon Canyon Lake | 294 | 3 | 0 | 0 | 1 |
| 32 | Spring Valley Wash | 135 | 3 | 0 | 0 | 0 |
| 33 | Red Lake Valley | 20 | 0 | 0 | 0 | 0 |
| 34 | Kaibab Lake | 20 | 0 | 0 | 0 | 0 |
| 35 | Pittman Valley | 18 | 0 | 0 | 0 | 0 |
| 36 | Davenport Lake | 4 | 0 | 1 | 0 | 0 |
| 37 | Scholz Lake | 80 | 2 | 9 | 0 | 0 |
| 38 | Cataract Lake | 80 | 2 | 9 | 0 | 0 |
| 39 | Willow Springs Lake | 120 | 0 | 0 | 0 | 0 |

Table 9 continued.

| Route Number | Route Name | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagle | Unknown Eagle |
|---|---|---|---|---|---|---|
| 40 | West Chevelon Canyon | 102 | 0 | 0 | 0 | 0 |
| 41 | Willow Creek | Not surveyed. | | | | |
| 42 | White Horse Lake – Pomeroy Tanks | 50 | 0 | 1 | 0 | 0 |
| 43 | JD Dam Lake | 20 | 1 | 0 | 0 | 0 |
| 45 | Steel/Stone Road | 150 | 1 | 3 | 0 | 1 |
| 48 | Blue Stem Wash-Babbit property | 200 | 3 | 0 | 0 | 0 |
| 49 | Glen Canyon Nat'l Rec. Area (Lake Powell to Lee's Ferry) | 90 | 3 | 5 | 0 | 0 |
| 118 | Bill Williams Loop Road | 125 | 3 | 2 | 0 | 0 |
| 119 | Johnson Canyon | 90 | 1 | 0 | 0 | 0 |
| 120 | Highway 64 east | 55 | 0 | 0 | 0 | 0 |
| 121 | Highway 64 | 64 | 2 | 0 | 0 | 0 |
| 122 | Camp Navajo | 205 | 0 | 0 | 0 | 0 |
| 123 | Partridge Creek | 228 | 3 | 1 | 0 | 3 |
| 124 | Odell Lake | 30 | 0 | 0 | 0 | 0 |
| 125 | Highway 87 north | 112 | 1 | 0 | 0 | 0 |
| 126 | Highway 180 | 235 | 1 | 1 | 0 | 0 |
| **Total** | | **6,035** | **58** | **40** | **1** | **6** |
| **Graham County** | | | | | | |
| 51 | Point of Pines Lake area | Not surveyed. | | | | |
| **Mohave County** | | | | | | |
| 57 | Alamo Lake | 100 | 2 | 3 | 0 | 0 |
| **Total** | | **100** | **2** | **3** | **0** | **0** |
| **Navajo County** | | | | | | |
| 58 | Lake of the Woods | 66 | 1 | 0 | 0 | 0 |
| 59 | Rainbow Lake | 60 | 8 | 3 | 0 | 0 |
| 61 | Whipple Lake | 15 | 0 | 0 | 0 | 0 |
| 62 | Long Lake | 10 | 0 | 0 | 0 | 0 |
| 63 | Lone Pine Dam | 60 | 2 | 0 | 0 | 0 |
| 64 | Schoens Reservoir | 60 | 0 | 0 | 0 | 0 |
| 65 | White Mountain Lake | 110 | 0 | 0 | 0 | 0 |
| 67 | Jacques Marsh | 45 | 0 | 1 | 0 | 0 |
| 68 | Scott's Reservoir | 45 | 2 | 0 | 0 | 0 |
| 69 | Show Low Lake | 105 | 1 | 0 | 1 | 0 |
| 70 | Pintail Lake | 10 | 0 | 0 | 0 | 0 |
| 71 | Telephone Lake | 10 | 3 | 0 | 0 | 0 |
| 72 | Fool Hollow Lake | 150 | 0 | 1 | 0 | 0 |
| 75 | Cottonwood Wash/ Clay Springs | 40 | 0 | 0 | 0 | 0 |
| 76 | White Lake | 8 | 0 | 0 | 0 | 0 |
| 127 | Mortenson Wash | 30 | 1 | 0 | 0 | 0 |
| **Total** | | **934** | **17** | **5** | **1** | **0** |
| **Santa Cruz County** | | | | | | |
| 82 | Pena Blanca Lake | 120 | 0 | 0 | 0 | 0 |
| **Total** | | **120** | **0** | **0** | **0** | **0** |
| **Yavapai County** | | | | | | |
| 83 | Wet Beaver Creek | 495 | 0 | 0 | 0 | 0 |
| 84 | Oak Creek | 480 | 1 | 0 | 0 | 0 |

Table 9 continued.

| Route Number | Route Name | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagle | Unknown Eagle |
|---|---|---|---|---|---|---|
| 85 | Willow Lake[1] | 240 | 1 | 3 | 0 | 0 |
| 86 | Lynx Lake | 240 | 2 | 1 | 0 | 0 |
| 87 | Watson Lake | 240 | 1 | 2 | 1 | 0 |
| 88 | Goldwater Lake | 270 | 1 | 1 | 1 | 0 |
| **Total** | | **1,965** | **6** | **7** | **2** | **0** |
| **Yuma and La Paz Counties** | | | | | | |
| 89 | Imperial N.W.R. Cibola/Martinez Lake – Colorado River | 360 | 2 | 2 | 0 | 0 |
| **Total** | | **360** | **2** | **2** | **0** | **0** |

[1]Time was averaged from previous years (2003-2011).

Table 10. 2012 Arizona bald eagle winter count helicopter survey results.

| Route Number | Route Name | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagle | Unknown Eagle |
|---|---|---|---|---|---|---|
| 90 | Verde River | 184 | 20 | 11 | 0 | 0 |
| 91 | Lower East Verde River | 10 | 2 | 1 | 0 | 0 |
| 92 | Lower West Clear Creek | 17 | 0 | 0 | 0 | 0 |
| 93 | Lower Salt River | 81 | 15 | 1 | 0 | 0 |
| 94 | Upper Salt River | 71 | 4 | 2 | 0 | 0 |
| 95 | Lower Tonto Creek | 28 | 4 | 0 | 0 | 0 |
| 97 | Lower Canyon Creek | 11 | 0 | 0 | 0 | 0 |
| 98 | Lower Cibecue Creek | 12 | 0 | 0 | 0 | 0 |
| 100 | White River | 19 | 3 | 1 | 0 | 0 |
| 101 | North Fork White River | 42 | 2 | 0 | 0 | 0 |
| 102 | Lower Black River | 80 | 24 | 9 | 3 | 0 |
| 103 | Big and Little Bonito Creeks | 25 | 0 | 0 | 0 | 0 |
| 104 | San Carlos River–Talkalai Lake | 18 | 3 | 2 | 0 | 0 |
| 105 | San Carlos Reservoir | 20 | 5 | 6 | 0 | 0 |
| 106 | Upper and Lower Gila River | 58 | 3 | 1 | 0 | 0 |
| 107 | Eagle Creek | 36 | 3 | 0 | 0 | 0 |
| 108 | Bonita Creek | 12 | 0 | 0 | 0 | 0 |
| 109 | Lower San Francisco River | 32 | 0 | 0 | 0 | 0 |
| 110 | Blue River | 11 | 0 | 0 | 0 | 0 |
| 111 | Sunrise Lake | 1 | 0 | 0 | 0 | 0 |
| 112 | Big Lake | 2 | 0 | 0 | 0 | 0 |
| 114 | Crescent Lake | 1 | 0 | 0 | 0 | 0 |
| 115 | Lake Pleasant | 22 | 2 | 0 | 0 | 0 |
| 116 | Del Rio Ponds | 1 | 1 | 0 | 0 | 0 |
| 117 | Tres Rios | 22 | 1 | 0 | 0 | 0 |
| **Total** | | **816** | **92** | **34** | **3** | **0** |

Table 11. 2012 Arizona bald eagle winter count non-standardized survey route results.

| Route Name | County | Minutes Surveyed | Adults | Subadults | Unknown Bald Eagle | Unknown Eagle |
|---|---|---|---|---|---|---|
| Highway 260 and F.R. 618 (976) | Yavapai | 285 | 0 | 0 | 0 | 0 |
| Blue Ridge Reservoir (977) | Coconino | 75 | 0 | 0 | 0 | 0 |
| Kachina Sewage Treatment (986) | Coconino | 36 | 1 | 0 | 0 | 0 |
| Clint's Well (991) | Coconino, Yavapai | 191 | 0 | 0 | 0 | 0 |
| SR 60 east of Springerville | Apache | 60 | 3 | 0 | 0 | 0 |
| Dogtown Lake | Coconino | 20 | 0 | 1 | 0 | 0 |
| **Total** | | **667** | **4** | **1** | **0** | **0** |

## APPENDIX B: RAPTOR REPRODUCTIVE STATUS CRITERIA

Breeding Area (BA): An area containing 1 or more nests within the range of 1 mated pair of birds. Operationally, once a BA is established, we consider it a BA whether it is occupied by bald eagles in a given year or not, until or unless it is designated historical.

Occupied BA/Nest: An occupied BA must have an occupied nest, which is any nest, where at least 1 of the following activity patterns was observed during the breeding season:

a. Young were raised.
b. Eggs were laid.
c. One adult sitting low in the nest, presumably incubating.
d. Two adults present on or near the nest.
e. One adult and 1 bird in immature plumage at or near a nest, if mating behavior was observed (display flight, nest repair, coition).
f. A recently repaired nest with fresh sticks, or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath.

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

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

Successful BA/Nest: An occupied nest from which at least 1 young fledged during the breeding season under consideration. Nests were successful if at least 1 young was raised past 8 weeks of development.

Failed BA/Nest: An occupied nest from which no young fledged regardless of cause.

Historical BA: A BA that has remained unoccupied for 10 consecutive years. This term also applies to BAs identified before the 1970s and have been unoccupied since the beginning of annual monitoring.

Reoccupied Historical BA: A Historical BA, which shows signs indicative of being active.

Pioneer Effort: The occupancy of a new nest, 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.

Existing Status: A 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: 2012 ARIZONA BALD EAGLE PRODUCTIVITY

Table 12. Arizona bald eagle breeding area productivity summary, 2012 (continued next page).

| Breeding Area | Status[1] | Nest[2] | Incubation Date | Eggs[3] | Hatch Date | Young | Fledged | Fledge Date |
|---|---|---|---|---|---|---|---|---|
| Alamo | S | 4 | 1/5-1/30 | 1 | 1/30-3/16 | 1 | 1 | 4/25-5/30 |
| Bagley | S | 2 | <1/10 | 3 | 1/31-3/22 | 3 | 3 | >4/26 |
| Bartlett | U | | | | | | | |
| Beaver | S | 1 | <1/5 | 1 | 1/30-3/16 | 1 | 1 | 3/16-4/25 |
| Becker | U | | | | | | | |
| Bill Williams Refuge | F | 1 | <2/3 | 3 | <3/5 | 3 | Failed 4/21-5/6. | |
| | | | Nestlings presumably died during extreme heat wave 4/21-4/23 (105F). | | | | | |
| Blue Point | U | Breeding area in use by the Bagley pair (see above). | | | | | | |
| Box Bar* | S | 4 | 1/9-1/30 | 2 | 2/17-2/22 | 2 | 2 | >5/6 |
| Bulldog | S | 2 | <1/10 | 2 | 1/30-3/16 | 2 | 2 | 4/13-4/26 |
| Burro Creek | U | | | | | | | |
| Canyon de Chelly | S | 2 | 3/8 | 2 | 3/8-4/25 | 2 | 2 | 5/24-6/26, >6/26 |
| Cedar Basin | U | | | | | | | |
| Cibecue | F | 2 | 1/31-3/22 | 1 | Failed by 4/26 during incubation | | | |
| Cliff* | S | 6 | 1/9-1/30 | 2 | 1/30-3/22 | 2 | 2 | 5/31-6/2 |
| Coldwater | S | 3 | 1/30-3/16 | 1 | 3/16-4/25 | 1 | 1 | >5/31 |
| Coolidge | U | Only 1 adult detected. | | | | | | |
| Crescent* | F | 1 | 3/12-3/22 | 1 | Failed by 5/6 during incubation. | | | |
| Doka* | S | 6 | <1/9 | 2 | 2/9-2/21 | 2 | 2 | 4/28-4/29 |
| Dupont | U | | | | | | | |
| East Verde | S | 4 | 1/30-3/16 | 2 | 3/16-4/25 | 2 | 2 | 5/18-5/31, >5/31 |
| Fish Creek | F | 1 | <1/10 | 1 | Failed by 3/22 during incubation. | | | |
| Fort McDowell* | F | 18 | 1/9-1/30 | 1 | Failed by 2/17 during incubation. | | | |
| Gilbert | F | 1 | <2/14 | 1 | Failed by 4/10 during incubation. | | | |
| Goldfield-Kerr* | S | 1 | <1/6 | 2 | 1/18-2/1 | 2 | 1 | 3/24 |
| | | | Second nestling pre-fledged and was presumably scavenged. | | | | | |
| Granite Basin | O | | | | | | | |
| Granite Reef* | F | 5 | <1/30 | 1 | Failed by 5/1 during incubation. | | | |
| Greer Lakes | O | 2 | | | | | | |
| Horse Mesa | S | 4 | <1/10 | 2 | 1/31-3/22 | 2 | 2 | >4/26 |
| Horseshoe | U | Only 1 adult detected. | | | | | | |
| Ive's Wash | F | 4 | 1/30-3/16 | 3 | 1/30-3/16 | 3 | Failed 4/25-5/30. | |
| | | | One nestling found dead in nest 4/25, presumably dehydrated. | | | | | |
| Ladders* | O | | | | | | | |
| Lone Pine | F | 2 | 1/31-3/22 | 1 | Failed by 5/31. | | | |
| Lower Lake Mary | S | 2 | 2/16-3/14 | 2 | 4/10-4/16 | 2 | 2 | 6/22-7/1, 7/1-7/3 |
| Luna* | S | 1 | <2/21 | 1 | 2/21-4/9 | 1 | 1 | 7/3 |

[1]Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed, FOS=Fostered (n= +X or –X are number of nestlings fostered or taken).

[2]Nest numbers are from Hunt and others 1992; Driscoll and Beatty 1994; Driscoll and others 1992, 1995a, 1995b, 1997, 1998, 1999; Jacobson and others 2004, 2005, 2006, 2007; Koloszar and Driscoll 2001a, 2001b; Koloszar and others 2002; Canaca and others 2004; McCarty and Jacobson 2008, 2009, 2010, 2011.

[3]Represents minimum number of eggs laid.

*Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 12 continued.

| Breeding Area | Status[1] | Nest[2] | Incubation Date | Eggs[3] | Hatch Date | Young | Fledged | Fledge Date |
|---|---|---|---|---|---|---|---|---|
| Lynx | F | 3 | 1/9-1/30 | 1 | Failed by 3/16 during incubation. | | | |
| Mohave | U | | | | | | | |
| Needle Rock* | U | Only 1 adult detected. | | | | | | |
| Oak Creek | S | 4 | 1/9-1/30 | 2 | 1/30-2/25 | 2 | 2 | >5/9 |
| Orme* | S | 7 | 1/9-1/30 | 3 | 1/30-3/16 | 2 | 2 | 5/15-5/17 |
| Pee Posh Wetlands | F | 3 | <1/9 | 2 | 1/30-2/10 | 2 | Failed 4/10. | |
| | | | Nestlings died in fire at 10 weeks of age. | | | | | |
| Perkinsville | F | 4 | 1/30-3/16 | 1 | 3/16-4/25 | 1 | Failed by 6/15. | |
| Pinal | S | 3 | <1/10 | 2 | 1/31-3/6 | 2 | 2 | >4/26 |
| Pinto* | F | 8 | 2/4-2/15 | 1 | Failed by 4/3 during incubation. | | | |
| Pleasant* | F | 3 | 12/20-1/9 | 2 | 2/7 | ≥1 | Failed by 2/10. | |
| | | | Appears to have hatched nestling(s) which died soon after hatch. | | | | | |
| Redmond | F | 5 | 1/10-1/31 | 1 | Failed by 4/26 during incubation. | | | |
| Riverside | S | 1 | <1/9 | 2 | 1/9-2/1 | 2 | 2 | 4/2-4/10 |
| Rock Creek | U | | | | | | | |
| Rodeo* | S | 4 | <1/9 | 2 | 2/7-2/21 | 2 | 2 | 5/11-5/12 |
| Saguaro | S | 2 | <3/22 | 3 | <3/22 | 3 | 3 | >5/10 |
| San Carlos | S | 6 | 1/10-1/31 | 1 | 1/31-3/22 | 1 | 1 | >5/18 |
| 76 | O | | | | | | | |
| Sheep* | F | 6 | 1/10-1/31 | 1 | 3/22-4/8 | 1 | Failed by 4/18. | |
| | | | Nestling missing from nest by 4/18. Adult male found dead 5/5 (dead for some time). | | | | | |
| Show Low Lake* | F | 1 | <3/29 | 1 | 4/3-4/8 | 1 | Failed by 4/28. | |
| | | | Appears to have hatched one nestling which died soon after hatch. Adult male continued to incubate, presumably a second unhatched egg. | | | | | |
| Silver Creek | S | 2 | 2/22-2/13 | 1 | 3/12-3/22 | 1 | 1 | 4/23-5/31 |
| Suicide | S | 1 | 1/10-1/31 | 2 | 1/31-3/22 | 2 | 2 | >5/18 |
| Sullivan Lake | S | 3 | <1/9 | 2 | 1/30-2/26 | 2 | 2 | 5/1, 5/10 |
| Sycamore* | S | 5 | <1/9 | 1 | 1/9-2/3 | 1 | 1 | 4/20 |
| Table Mountain | F | 4 | 1/30-3/16 | 1 | Failed by 5/18 during incubation. | | | |
| Talkalai | S | 8 | 1/10-1/31 | 1 | 1/31-3/22 | 1 | 1 | >5/18 |
| Tapco | F | 2 | <2/28 | 1 | Failed by 4/25 during incubation. | | | |
| Tonto* | S | 2 | 1/10-1/31 | 2 | 2/25 | 2 | 2 | 5/15, 5/18 |
| Tortilla Creek | S | 1 | 1/10-1/31 | 1 | 1/31-3/22 | 1 | 1 | >5/10 |
| Tower | U | | | | | | | |
| White Horse Lake | S | 1 | <5/18 | 1 | <5/18 | 1 | 1 | 7/9 |
| Woods Canyon* | S | 3 | <4/14 | 1 | 5/11-5/20 | 1 | 1 | 8/10 |
| Yellow Cliffs | S | 1 | 1/9-1/30 | 2 | 1/30-3/16 | 2 | 2 | >5/4 |
| Black Canyon[4] | F | 1 | <2/10 | 1 | 2/10-4/16 | 1 | Failed by 5/30. | |
| Copper Basin[4] | U | | | | | | | |

[1]Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed, FOS=Fostered (n= +X or –X are number of nestlings fostered or taken).

[2]Nest numbers are from Hunt and others 1992; Driscoll and Beatty 1994; Driscoll and others 1992, 1995a, 1995b, 1997, 1998, 1999; Jacobson and others 2004, 2005, 2006, 2007; Koloszar and Driscoll 2001a, 2001b; Koloszar and others 2002; Canaca and others 2004; McCarty and Jacobson 2008, 2009, 2010, 2011.

[3]Represents minimum number of eggs laid.

[4]Black Canyon and Copper Basin are outside of Arizona state boundaries and are monitored opportunistically. They are not included in productivity calculations. Observations of the Black Canyon nest by the NPS are included.

*Nests monitored by the Arizona Bald Eagle Nestwatch Program.

## APPENDIX D: NEST SURVEY RESULTS

Table 13. Results of the 2012 winter count, ORA, and nest survey flights (continued next page).

| Location | Time | Comments |
|---|---|---|
| **January 9, 2012** | | |
| Riverside BA | 0745 | Adult incubating in nest #1. |
| Granite Reef BA | 0752 | All known nests empty. No bald eagles. |
| Orme BA | 0755 | All known nests empty. No bald eagles. |
| Rodeo BA | 0757 | Adult incubating in nest #4. Second adult in area. |
| Sycamore BA | 0801 | Adult incubating in nest #5. |
| Doka BA | 0805 | Nest #5 fallen. Adult incubating in new tree nest #6. Second adult in area. |
| Fort McDowell BA | 0809 | Two adults standing in new tree nest #18. |
| Box Bar BA | 0812 | Two adults standing in nest #4. |
| Needle Rock BA | 0815 | Nest #2 fallen. No bald eagles. |
| Bartlett BA | 0821 | All known nests empty. No bald eagles. |
| Yellow Cliffs BA | 0833 | All known nests empty. Two adults in area. |
| Cliff BA | 0845 | All known nests empty. No bald eagles. |
| Horseshoe BA | 0902 | All known nests empty. No bald eagles. |
| Table Mountain BA | 0911 | All known nests empty. No bald eagles. |
| East Verde River | 0919 | No new nests. Two adults and one immature in LF Ranch area. |
| East Verde BA | 0935 | All known nests empty. Two adults in area. |
| Coldwater BA | 0943 | All known nests empty. One adult in area. |
| Ladders BA | 0949 | All known nests empty. One immature bald eagle in area. |
| West Clear Creek | 1000 | All known nests empty. No bald eagles. |
| Beaver BA | 1159 | Adult incubating in nest#1. |
| Oak Creek BA | 1208 | All known nests empty. No bald eagles. |
| Tapco BA | 1226 | One adult perched by nest #1. |
| Tower BA | 1229 | All known nests empty. No bald eagles. |
| Mormon Pocket nest site | 1235 | All known nests empty. No bald eagles. |
| Perkinsville BA | 1238 | All known nests empty. No bald eagles. |
| Hell Point historic BA | 1245 | All known nests empty. Two immature and one adult bald eagle in area. |
| Granite nest site | 1250 | All known nests empty. One golden eagle perched by nest #2. |
| Sullivan Lake BA | 1312 | Adult incubating in nest #2 (re-built). |
| Lynx BA | 1325 | Nest #3 re-built. All known nests empty. No bald eagles. |
| Pleasant BA | 1342 | Adult incubating in nest #3. |
| Pee Posh Wetlands BA | 1445 | Adult incubating in new tree nest #3. |
| **January 10, 2012** | | |
| Goldfield-Kerr BA | 0804 | Adult incubating in nest #2. Second adult in area. |
| Bulldog BA | 0812 | Adult incubating in nest #2. |
| Bagley & Blue Point BAs | 0830-0834 | Adult incubating in Bagley nest #2 (Blue Point #10). One adult standing in Bagley #1. |
| Saguaro BA | 0835 | All known nests empty. Two adults in area. |
| Tortilla BA | 0844 | Two adults standing in nest #1. |
| Fish Creek BA | 0854 | Adult incubating in nest #1. |
| Horse Mesa BA | 0902 | Adult incubating in nest #4. Second adult in area. |
| Tonto BA | 0916 | Two adults standing in nest #2. |
| Sheep BA | 0925 | Nest # 5 fallen. All known nests empty. No bald eagles. |
| 76 BA | 0940 | All known nests empty. No bald eagles. |
| Pinto BA | 1025 | New snag nest #8 empty. No bald eagles. |
| Pinal BA | 1035 | Adult incubating in nest #3. |

Table 13 continued.

| Location | Time | Comments |
|---|---|---|
| Redmond BA | 1228 | All known nests empty. No bald eagles. |
| Canyon historic BA | 1245 | All known nests empty. No bald eagles. |
| Talkalai BA | 1408 | Nest #7 fallen. One adult in area of new tree nest #8. |
| San Carlos BA | 1421 | Nest #5 fallen. All known nests empty. No bald eagles. |
| Suicide BA | 1441 | One adult standing in nest #1. |
| Coolidge BA | 1446 | All known nests empty. One adult in area. |
| Granite Basin BA | 1521 | All known nests empty. No bald eagles. |
| **January 11, 2012** | | |
| Cibecue BA | 1019 | All known nests empty. One adult in area. |
| Mule Hoof historic BA | 1031 | All known nests empty. No bald eagles. |
| Cedar Basin BA | 1051 | All known nests empty. One adult in area. |
| Lone Pine BA | 1101 | Nest #5 fallen. All known nests empty. One adult in area. |
| Crescent BA | 1210 | All known nests empty. No bald eagles. |
| George's Basin nest site | 1407 | New snag nest #1. Two adults in area. |
| **January 12, 2011** | | |
| Willow nest site | | No new nests or bald eagles. |
| Eagle nest site | | No new nests or bald eagles. |
| **January 30, 2011** | | |
| Riverside BA | 0846 | Adult incubating or brooding. |
| Granite Reef BA | 0854 | Adult incubating in new tree nest #5. |
| Orme BA | 0856 | Adult incubating in new platform-tree nest #7. |
| Rodeo BA | 0857 | Adult incubating. |
| Sycamore BA | 0901 | Adult incubating. |
| Doka BA | 0905 | Adult incubating. |
| Fort McDowell BA | 0908 | Adult incubating in new tree nest #18. |
| Box Bar BA | 0909 | Adult incubating in nest #4. Second adult perched in area. |
| Needle Rock BA | 0909 | All known nests empty. One adult in area. |
| Bartlett BA | 0915 | All known nests empty. No bald eagles. |
| Yellow Cliffs BA | 0919 | Adult incubating in nest #1. Second adult in area. |
| Cliff BA | 0930 | Adult incubating in nest #6. |
| Horseshoe BA | 0940 | All known nests empty. No bald eagles. |
| Table Mountain BA | 0955 | All known nests empty. Two adults in area. |
| East Verde BA | 1006 | All known nests empty. No bald eagles. |
| Coldwater BA | 1021 | All known nests empty. Two adults in area. |
| Ladders BA | 1025 | All known nests empty. Two adults in area. |
| Beaver BA | 1034 | Adult incubating. Second adult in area. |
| Oak Creek BA | 1039 | Adult incubating in nest #4. |
| Tapco BA | 1046 | All known nests empty. No bald eagles. |
| Tower BA | 1052 | All known nests empty. No bald eagles. |
| Mormon Pocket nest site | 1101 | All known nests empty. No bald eagles. |
| Perkinsville BA | 1103 | Two adults standing in nest #4. |
| Hell Point historic BA | 1300 | All known nests empty. No bald eagles. |
| Granite nest site | 1310 | New cliff nest #5. All known nests empty. No bald eagles. |
| Sullivan Lake BA | 1314 | Adult incubating . Second adult in area. |
| Watson Lake nest site | 1325 | All known nests empty. No bald eagles. |
| Lynx BA | 1330 | Adult incubating in nest #3. Second adult in area. |
| Burro Creek BA | 1403 | No new nests or bald eagles. |
| Alamo BA | 1424 | Adult incubating in nest #4. |
| Ive's Wash BA | 1430 | All known nests empty. Two adults in area. |

Table 13 continued.

| Location | Time | Comments |
|---|---|---|
| Pleasant BA | 1535 | No adults in area. Two eggs in nest. |
| Pee Posh Wetlands BA | 1553 | Adult incubating. |
| **January 31, 2011** | | |
| Goldfield-Kerr BA | 0738 | Adult incubating or brooding. |
| Bulldog BA | 0742 | Adult incubating. |
| Bagley & Blue Point BAs | 0744-0750 | Adult incubating in Bagley #2 (Blue Point #10). All other known nests empty. One near-adult at lake. |
| Saguaro BA | 0753 | All known nests empty. One adult in area. |
| Tortilla Creek BA | 0800 | Adult incubating in nest #1. |
| Fish Creek BA | 0807 | Adult incubating. |
| Horse Mesa BA | 0811 | Adult incubating. |
| Rock Creek BA | 0816 | All known nests empty. No bald eagles. |
| Tonto BA | 0821 | Adult incubating in nest #2. |
| Sheep BA | 0830 | Adult incubating in new tree nest #6. Second adult in nest. |
| 76 BA | 0841 | One adult standing in nest #4. |
| Pinto BA | 0900 | One adult standing in nest #8. |
| Pinal BA | 0904 | Adult incubating. |
| Redmond BA | 0907 | Adult incubating in nest #5. |
| Cibecue BA | 1041 | All known nests empty. No bald eagles. |
| Mule Hoof historic BA | 1056 | All known nests empty. No bald eagles. |
| Cedar Basin BA | 1109 | All known nests empty. No bald eagles. |
| Lone Pine BA | 1117 | All known nests empty. One adult in area. |
| George's Basin nest site | 1127 | All known nests empty. One adult in area. |
| Talkalai BA | 1249 | Adult incubating in nest #8. |
| San Carlos BA | 1254 | Adult incubating in nest #6. |
| Suicide BA | 1300 | Adult incubating in nest #1. Second adult in area. |
| Coolidge BA | 1305 | All known nests empty. No bald eagles. |
| Granite Basin BA | 1311 | All known nests empty. No bald eagles. |
| Winkelman historic BA | 1412 | No new nests or bald eagles. |
| **March 16, 2012** | | |
| Riverside BA | 0755 | Two 7-week old nestlings. One adult in tree. |
| Granite Reef BA | 0811 | Adult incubating or brooding. |
| Orme | 0813 | At least one 3.5-week old nestling. One adult in area. |
| Rodeo BA | 0815 | Two 4-week old nestlings. |
| Sycamore BA | 0817 | One 5.5-week old nestling. |
| Doka BA | 0820 | Two 4-week old nestlings. One adult in area. |
| Fort McDowell BA | 0822 | Failed. All known nests empty. No bald eagles. |
| Box Bar BA | 0825 | Two 3-week old nestlings. One adult in tree. |
| Needle Rock BA | 0827 | All known nests empty. No bald eagles. |
| Bartlett BA | 0832 | All known nests empty. No bald eagles. |
| Yellow Cliffs BA | 0836 | At least one 2.5-week old nestling. One adult in nest. |
| Sheep Creek | 0840 | One adult in area. |
| Cliff BA | 0843 | Adult brooding at least one 1.5-week old nestling. Second adult in nest. |
| Horseshoe BA | 0848 | All known nests empty. No bald eagles. |
| Table Mountain BA | 0900 | Adult incubating in nest #4. |
| East Verde BA | 0912 | Adult incubating in nest #4. |
| Coldwater BA | 0915 | Adult incubating in nest #3. |
| Ladders BA | 0920 | All known nests empty. No bald eagles. |
| Beaver BA | 0930 | One 5-week old nestling. One adult flew to nest. |

Table 13 continued.

| Location | Time | Comments |
|---|---|---|
| Oak Creek BA | 0938 | Adult in nest shading or brooding at least one nestling. |
| Tapco BA | 0957 | Adult incubating in new snag nest #2. |
| Tower BA | 1004 | All known nests empty. No bald eagles. |
| Mormon Pocket nest site | 1010 | All known nests empty. No bald eagles. |
| Perkinsville BA | 1012 | Adult incubating in nest #4. |
| Hell Point historic BA | 1023 | Golden eagle incubating in nest #3. |
| Granite nest site | 1030 | All known nests empty. No bald eagles. One golden eagle in area. |
| Sullivan Lake BA | 1037 | Two 4.5-week old nestlings. One adult in area. |
| Watson Lake nest site | 1218 | All known nests empty. No bald eagles. |
| Lynx BA | 1223 | Failed. Nest empty. No bald eagles. |
| Devil's Post historic BA | 1255 | All known nests empty. No bald eagles. |
| Burro Creek BA | 1308 | No new nests or bald eagles. |
| Alamo BA | 1326 | One adult shading or brooding at least one 1.5-week old nestling. Second adult in nest. |
| Ive's Wash BA | 1331 | One adult in nest #4 shading or brooding at least one hatchling. |
| Pleasant BA | 1408 | All known nests empty. One adult in area. |
| Pee Posh Wetlands BA | 1425 | Two 5-week old nestlings. One adult in nest. |
| **March 22, 2012** | | |
| Granite Reef BA | 0733 | Adult incubating. |
| Bulldog BA | 0737 | Two 6-week old nestlings. |
| Bagley & Blue Point BAs | 0750 | Three 6-week old nestlings (Bagley). One adult in area. |
| Saguaro BA | 0756 | Adult in new cliff nest #2 with at least two 2.5-week old nestlings. |
| Fish Creek BA | 0806 | Failed. Nest empty and no eagles. |
| Horse Mesa BA | 0810 | Two 4-week old nestlings. One adult in nest. Second adult in area, flushed. |
| Rock Creek BA | 0822 | All known nests empty. No bald eagles. |
| Tonto BA | 0827 | Two 3-week old nestlings. One adult in nest. Second adult in tree. |
| Sheep BA | 0831 | Adult incubating or brooding. |
| 76 BA | 0845 | All known nests empty. Two adults in area. |
| Dupont BA | 0905 | All known nests empty. No bald eagles. |
| Pinto BA | 0916 | Adult incubating in nest #8. |
| Pinal BA | 0919 | Two 4.5-week old nestlings. |
| Redmond BA | 0925 | Adult incubating. |
| Cibecue BA | 1100 | Adult incubating in nest #2. |
| Cedar Basin BA | 1110 | All known nests empty. No bald eagles. |
| Lone Pine BA | 1122 | Adult incubating in nest #2. |
| George's Basin nest site | 1130 | All known nests empty. No bald eagles. |
| Crescent BA | 1157 | Adult incubating in nest #1. |
| Greer Lakes BA | 1205 | All known nests empty. No bald eagles. |
| Silver Creek BA | 1237 | Adult brooding at least one nestling in new tree nest #2. Second adult in area. |
| Talkalai BA | 1423 | One 3-week old nestling. One adult in nest. |
| San Carlos BA | 1429 | One 2.5-week old nestling. One adult in nest. |
| Suicide BA | 1436 | Two 2-week old nestlings. One adult in nest. |
| Coolidge BA | 1450 | All known nests empty. No bald eagles. |
| Granite Basin BA | 1505 | All known nests empty. No bald eagles. |
| **April 16, 2012** | | |
| Pee Posh Wetlands BA | 0820 | Failed. Nest #3 destroyed by recent fire. |
| Gila River to Buckeye | 0844 | No new nests or bald eagles. |

Table 13 continued.

| Location | Time | Comments |
|---|---|---|
| Alamo BA | 0928 | One 6-week old nestling. One adult flew to nest. |
| Ive's Wash BA | 0935 | Three 4-week old nestlings. Two adults in area. |
| Bill Williams River | 0944 | All known nests empty. No bald eagles. |
| Bill Williams BA | 1000 | One adult shading at least two 4.5-week old nestlings in new tree nest #1. |
| Gene Wash Reservoir (CA) | 1020 | All known nests empty. No bald eagles. |
| Copper Basin BA (CA) | 1025 | All known nests empty. No bald eagles. |
| Colorado River to Havasu | 1030 | No new nests or bald eagles. |
| Mohave BA | 1240 | Found new cliff nests #2, 3, and 4. All known nests empty. No bald eagles. |
| Colorado River to Willow Beach | 1243 | All known nests empty. No bald eagles. |
| Black Canyon BA (NV) | 1409 | Adult in nest with at least one 4.5-week old nestling. Second adult in area. |
| **April 25, 2012** | | |
| Ive's Wash BA | 0820 | Banded two 5-week old nestlings. |
| Alamo BA | 1015 | One 7-week old nestling standing on nest edge. |
| Goldwater Lake | 1045 | No new nests or bald eagles. |
| Lynx BA | 1053 | All known nests empty. No bald eagles. |
| Watson Lake nest site | 1057 | All known nests empty. No bald eagles. One golden eagle in area. |
| Sullivan Lake BA | 1235 | Two 10-week old nestlings. |
| Granite nest site | 1240 | All known nests empty. No bald eagles. |
| Hell Point historic BA | 1251 | Golden eagle incubating or brooding. |
| Perkinsville BA | 1303 | One 3-week old nestling. |
| Mormon Pocket nest site | 1305 | All known nests empty. No bald eagles. |
| Tapco BA | 1310 | Failed. Nest empty. No bald eagles. |
| Oak Creek BA | 1317 | Two 8-week old nestlings. |
| Beaver BA | 1325 | Nest empty, presume fledged. Two adults on river. |
| Coldwater BA | 1333 | One 4-week old nestling. One adult in nest, flushed. |
| East Verde BA | 1340 | Two 4week old nestlings. One adult in area. |
| Table Mountain BA | 1405 | One 3.5-week old nestling. One adult above nest. |
| Yellow Cliffs BA | 1416 | Two 8-week old nestlings. |
| Box Bar BA | 1422 | Two 8.5-week old nestlings. |
| Doka BA | 1425 | Two 9.5-week old nestlings. |
| Sycamore BA | 1427 | Nest empty, fledged (verified by nestwatchers). |
| Rodeo BA | 1429 | Two 9.5-week old nestlings. |
| Orme BA | 1430 | Two 8-week old nestlings. |
| Granite Reef BA | 1433 | Adult incubating. Second adult in area. |
| **April 26, 2012** | | |
| Goldfield BA | 0755 | One fledgling at nest. |
| Bulldog BA | 0804 | Nest empty, fledged. |
| Bagley BA | 0807 | Three 10-week old nestlings. |
| Saguaro BA | 0810 | Three 7-week old nestlings. |
| Tortilla BA | 0814 | One 7-week old nestling. |
| Horse Mesa BA | 0819 | Two 9-week old nestlings. |
| Tonto BA | 0827 | Two 8-week old nestlings. |
| 76 BA | 0842 | All known nests empty. One adult in area. |
| Pinal BA | 0953 | Two 9.5-week old nestlings |
| Redmond BA | 0957 | Failed. Nest empty and no eagles. |
| Cibecue BA | 1007 | Failed. Nest empty and no eagles. |
| Talkalai BA | 1025 | One 8-week old nestling. One adult in nest. |

Table 13 continued.

| Location | Time | Comments |
|---|---|---|
| San Carlos BA | 1032 | One 7-week old nestling. One adult in nest. |
| Suicide BA | 1037 | Two 7-week old nestlings. One adult in nest. |
| Coolidge BA | 1040 | All known nests empty. No bald eagles. |
| Granite Basin BA | 1051 | All known nests empty. Two adults in area. |
| **May 31, 2012** | | |
| Rock Creek BA | 0750 | All known nests empty. No bald eagles. |
| Popcorn Canyon | 0824 | One adult flushed from perch. No new nests. |
| Lone Pine BA | 0828 | Failed. Nest empty, no eagles in area. |
| Scott Reservoir | 0850 | No new nests or bald eagles. |
| Show Low Lake BA | 0851 | Adult incubating in nest#1. |
| Silver Creek BA | 0910 | One fledgling perched on ground. One adult in area. |
| Black Canyon Lake nest site | 1015 | Nest #1 fallen. No new nests or bald eagles. |
| Willow Springs Lake nest site | 1030 | Ospreys active in nest #1-5. New nest #6 also active osprey. No bald eagles. |
| Woods Canyon Lake BA | 1040 | Adult in nest #3 feeding at least one nestling. Nests #1, 2 not seen, presumed fallen. |
| Bear Canyon Lake nest site | 1045 | Osprey active in nest #1. No bald eagles. |
| Knoll Lake nest site | 1055 | All known nests empty. Nests #2-4 not seen, presumed fallen. No bald eagles. |
| Blue Ridge Reservoir nest site | 1115 | Osprey active in nest #2. Nests #1, 3, 4, 5 not seen (#1, 3 presumed fallen). No bald eagles. |
| East Verde BA | 1143 | One 9-week old nestling. |
| Coldwater BA | 1148 | One 9-week old nestling. |
| JD Dam Lake nest site | 1338 | Osprey active in nest #1 and new snag nest #2. No bald eagles. |
| White Horse Lake BA | 1340 | Adult in nest #1 shading one 3-week old nestling. |
| Sunflower Flat nest site | 1344 | New nest #2 active osprey. Nest #1 fallen. No bald eagles. |
| Dogtown Lake nest site | 1350 | Nest #1 fallen. No new nests or bald eagles. |

## APPENDIX E: BOX BAR BREEDING AREA SUMMARY

Table 14. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| OHV | 6 | 15 | 2 | 1 | – | – | – | 24 | 49.0 |
| Gunfire | 2 | 5 | – | – | – | – | – | 7 | 14.3 |
| Helicopter | – | 4 | 1 | – | – | – | – | 5 | 10.2 |
| Equestrian | 1 | – | 1 | – | – | – | 1 | 3 | 6.1 |
| Small plane | – | 2 | 1 | – | – | – | – | 3 | 6.1 |
| Driver (in river) | – | 1 | 1 | – | – | – | – | 2 | 4.1 |
| Hunter | – | 1 | – | 1 | – | – | – | 2 | 4.1 |
| Camper | 1 | – | – | – | – | – | – | 1 | 2.0 |
| Woodcutter | – | 1 | – | – | – | – | – | 1 | 2.0 |
| Ultralight | 1 | – | – | – | – | – | – | 1 | 2.0 |
| Total | 11 | 29 | 6 | 2 | – | – | 1 | 49 | |

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

Table 15. Observed forage events and success, Box Bar BA, Arizona, 2012.

| Sex | Fish | | Unknown | | Total | |
|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U |
| Male | 1 | 1-0 | – | – | 1 | 1-0 |
| Female | 2 | 2-0 | 2 | 2-0 | 4 | 4-0 |
| Total | 3 | 3-0 | 2 | 2-0 | 5 | 5-0 |

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

Table 16. Observed prey types delivered to the nest, Box Bar BA, Arizona, 2012.

| Sex | Fish | Unknown | Total | Percent |
|---|---|---|---|---|
| Male | 13 | 8 | 21 | 67.7 |
| Female | 8 | 2 | 10 | 32.3 |
| Total | 21 | 10 | 31 | |
| Percent | 67.7 | 32.3 | | |

| Table 17. Bald eagle habitat analysis at the Box Bar BA, Arizona, 2012. | | | | | | |
|---|---|---|---|---|---|---|
| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type[5] | Land Type[6] |
| 23.9 | CF | Right | Yes | 1 | RI | – |
| 24.4 | CM | Right | No | 4 | – | MB |
| 24.6 | HS | Right | No | 4 | – | MB |
| 24.8 | CM | Right | Partial | 4 | – | MB |
| 24.9 | YM | Right | No | 4 | – | MB |
| 25.0 | CL | Right | No | 4 | – | MB |
| 25.1 | CL | Right | No | 4 | – | WT |
| 25.2 | YL | Right | No | 4 | – | MB |
| 25.3 | CL | Right | No | 4 | – | MB |
| 25.4 | CL | Right | No | 4 | – | MB |
| 25.5 | CM | Right | No | 4 | – | MB |
| 25.6 | CL | Right | No | 4 | – | MB |
| 25.9 | CL | Left | Partial | 3 | – | CW |
| 26.7 | SM | Right | No | 3 | – | MB |

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff ledge, CL=cottonwood large/20-30m, CM=cottonwood medium/10-20m, HS=hard snag (main branches only), SM=snag, mesquite, YL=sycamore large/10-20m, YM=sycamore medium/5-10m.
[3]Side of river facing downstream.
[4]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[5]RI=riffle.
[6]CW=cottonwood grove, MB=mesquite bosque, WT=willow thicket.

| Table 18. Bald eagle habitat use at the Box Bar BA, Arizona, 2012. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| River km[1] | PW[2,3] | VX | PP | PH | PU | PE | PK | PI | Total | Percent |
| 23.9 | 182 | – | – | – | – | – | – | – | 182 | 4.4 |
| 24.4 | – | 85 | – | – | – | – | – | – | 85 | 2.1 |
| 24.6 | – | – | 2 | – | – | – | – | – | 2 | 0.1 |
| 24.8 | 80 | 29 | – | – | – | – | – | – | 109 | 2.7 |
| 24.9 | 147 | 57 | – | – | – | – | – | – | 204 | 5.0 |
| 25.0 | – | 20 | – | – | – | – | – | – | 20 | 0.5 |
| 25.1 | 4 | 102 | 2 | – | – | – | – | – | 108 | 2.6 |
| 25.2 | 28 | 296 | 4 | – | 3 | – | – | – | 331 | 8.0 |
| 25.3 | 1,210 | 205 | 62 | – | – | – | – | – | 1,477 | 35.9 |
| 25.4 | 720 | – | 8 | – | – | 11 | – | – | 739 | 18.0 |
| 25.5 | 509 | 5 | 79 | – | – | – | 10 | – | 603 | 14.7 |
| 25.6 | 94 | 35 | – | 37 | – | – | – | – | 166 | 4.0 |
| 25.9 | 74 | – | – | – | 9 | – | – | – | 83 | 2.0 |
| 26.7 | – | – | – | – | – | – | – | 4 | 4 | 0.1 |
| Total | 3,048 | 834 | 157 | 37 | 12 | 11 | 10 | 4 | 4,113 | |
| Percent | 74.1 | 20.3 | 3.8 | 0.9 | 0.3 | 0.3 | 0.2 | 0.1 | | |

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, VX=various activities, PP=perched preening, PH=perched hunting, PU=perched unknown, PE=perched eating, PK=perched with prey, PI-perched interaction.

## APPENDIX F: CLIFF BREEDING AREA SUMMARY

| Table 19. Observed human activity and bald eagle behavior, Cliff BA, Arizona, 2012. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
| Small Plane | – | 8 | 1 | – | – | – | – | 9 | 25.0 |
| Helicopter | 1 | 4 | 1 | – | – | – | – | 6 | 16.7 |
| Driver | 6 | – | – | – | – | – | – | 6 | 16.7 |
| Hiker | 1 | 3 | – | – | – | – | – | 4 | 11.1 |
| OHV/ATV | – | 1 | – | 1 | – | – | – | 2 | 5.6 |
| Shooter | 2 | – | – | – | – | – | – | 2 | 5.6 |
| Apache Helicopter | – | 2 | – | – | – | – | – | 2 | 5.6 |
| Military Jet | – | 2 | – | – | – | – | – | 2 | 5.6 |
| Horse Riders | 1 | – | – | – | – | – | – | 1 | 2.8 |
| Hunter | 1 | – | – | – | – | – | – | 1 | 2.8 |
| Military Helicopter | – | – | 1 | – | – | – | – | 1 | 2.8 |
| Total | 11 | 20 | 3 | 1 | – | – | – | 36 | |

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

| Table 20. Observed forage events and success, Cliff BA, Arizona, 2012. | | | | | | |
|---|---|---|---|---|---|---|
| Sex | Fish | | Mammals | | Total | |
| | E[1] | S-U[2] | E | S-U | E | S-U |
| Male | 4 | 4-0 | – | – | 4 | 4-0 |
| Female | 4 | 4-0 | 1 | 1-0 | 5 | 5-0 |
| Total | 8 | 8-0 | 1 | 1-0 | 9 | 9-0 |

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

| Table 21. Observed prey types delivered to the nest, Cliff BA, Arizona, 2012. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sex | Fish | Mammals | Reptiles | Birds | Unknown | Total | Percent |
| Male | 29 | – | 2 | – | 1 | 32 | 62.7 |
| Female | 10 | 3 | 1 | 1 | 2 | 17 | 33.3 |
| Unknown | 2 | – | – | – | – | 2 | 3.9 |
| Total | 41 | 3 | 3 | 1 | 3 | 51 | |
| Percent | 80.4 | 5.9 | 5.9 | 2.0 | 5.9 | | |

| Table 22. Observed prey species delivered to the nest, Cliff BA, Arizona 2012. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sex | Fish | | | Mammals | | Reptiles | Total | Percent |
| | CP[1] | LB | CC | GS | RS | RE | | |
| Male | 2 | 1 | 1 | – | – | 1 | 5 | 62.5 |
| Female | – | – | – | 2 | 1 | – | 3 | 37.5 |
| Total | 2 | 1 | 1 | 2 | 1 | 1 | 8 | |
| Percent | 22.2 | 12.5 | 12.5 | 22.2 | 12.5 | 12.5 | | |

[1]CP=common carp, LB=largemouth bass, CC=channel catfish, GS=ground squirrel species, RS=rock squirrel, RE=red-eared slider.

| Table 23. Bald eagle habitat analysis at the Cliff BA, Arizona, 2012. | | | | | | |
|---|---|---|---|---|---|---|
| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type | Land Type[5] |
| 66.5 | SG | Right | No | 4 | – | MB |
| 66.6 | SG | Right | No | 4 | – | MB |
| 66.7a | SG | Right | No | 4 | – | MB |
| 66.7b | CF | Left | Partial | 1 | – | CL |
| 66.7c | HS | Right | No | 4 | – | MB |
| 66.8 | ST | Right | No | 4 | – | MB |
| 67.0 | HS | Right | No | 2 | – | MB |
| 67.1 | CL | Right | No | 2 | – | MB |
| 67.3 | ST | Right | No | 2 | – | MB |
| 67.5 | CL | Right | Partial | 1 | – | CW |
| 67.7 | CF | Left | Partial | 1 | – | CL |
| 69.2 | YL | Left | No | 1 | – | WT |

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff ledge, CL=cottonwood large/20-30m, HS=hard snag (main branches only), SG=soft snag, ST=snag top, YL=sycamore large/10-20m.
[3]Side of river facing downstream.
[4]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[5]CL=cliff, CW=cottonwood grove, MB=mesquite bosque, WT=willow thicket.

| Table 24. Bald eagle habitat use at the Cliff BA, Arizona, 2012. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| River km[1] | PW[2,3] | PH | PP | PV | PK | PE | PI | PU | Total | Percent |
| 66.5 | 297 | – | 29 | – | 1 | – | – | – | 327 | 4.1 |
| 66.6 | 2,698 | – | 103 | 1 | – | – | – | – | 2,802 | 35.2 |
| 66.7 | 1,879 | 627 | – | 21 | 13 | – | – | 2 | 2,542 | 31.9 |
| 66.8 | 133 | 250 | 8 | – | – | 14 | – | 1 | 406 | 5.1 |
| 67.0 | 28 | – | 9 | – | – | – | – | – | 37 | 0.4 |
| 67.1 | 67 | 425 | – | – | – | – | – | – | 492 | 6.2 |
| 67.3 | 16 | – | – | – | – | – | – | – | 16 | 0.2 |
| 67.5 | – | 180 | – | – | – | – | – | – | 180 | 2.3 |
| 67.7 | 210 | 941 | – | – | – | – | 4 | – | 1,155 | 14.5 |
| Total | 5,328 | 2,423 | 149 | 22 | 14 | 14 | 4 | 3 | 7,957 | |
| Percent | 67.0 | 30.5 | 1.9 | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 | | |

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, PP=perched preening, PV=perched vocalizing, PK=perched with prey, PE=perched eating, PI-perched interaction, PU=perched unknown,

## APPENDIX G: CRESCENT BREEDING AREA SUMMARY

Table 25. Observed human activity and bald eagle behavior, Crescent BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | Total | Percent |
|---|---|---|---|---|---|---|---|---|
| Anglers | 76 | – | – | – | – | – | 76 | 66.7 |
| Boater - fishing | 18 | – | – | – | – | – | 18 | 15.8 |
| Float tubers | 10 | – | – | – | – | – | 10 | 8.8 |
| Picnickers | 5 | – | – | – | – | – | 5 | 4.4 |
| Canoe/ kayak | 1 | – | – | – | – | – | 1 | 0.9 |
| Photographer | 1 | – | – | – | – | – | 1 | 0.9 |
| Agency worker | 1 | – | – | – | – | – | 1 | 0.9 |
| Driver | 1 | – | – | – | – | – | 1 | 0.9 |
| Small Plane | 1 | – | – | – | – | – | 1 | 0.9 |
| Total | 114 | – | – | – | – | – | 114 | |

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

Table 26. Observed forage events and success, Crescent BA, Arizona, 2012.

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

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

Table 27. Observed prey types delivered to the nest, Crescent BA, Arizona, 2012.

| Sex | Fish[1] | Total | Percent |
|---|---|---|---|
| Male | 4 | 4 | 80.0 |
| Female | 1 | 1 | 20.0 |
| Total | 5 | 5 | |
| Percent | 100 | | |

[1]All prey types were identified as rainbow trout. No feeding of young was observed.

| Table 28. Bald eagle habitat analysis at the Crescent BA, Arizona, 2012. | | | | | | |
|---|---|---|---|---|---|---|
| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type | Land Type[5] |
| 2.0 | PS | West | Yes | 6 | – | CF |
| 2.1a | PS | West | Yes | 4 | – | CF |
| 2.1b | PO | West | No | 7 | – | CF |
| 2.2a | PO | West | Yes | 8 | – | CF |
| 2.2b | HS | West | No | 8 | – | CF |
| 2.3a | PO | West | Yes | 7 | – | CF |
| 2.3b | PO | West | Yes | 8 | – | CF |
| 2.4 | SC | West | No | 8 | – | CF |
| 2.5 | PO | West | No | 6 | – | CF |
| 2.6 | PO | West | Yes | 3 | – | CF |

[1]Lake kilometer (clockwise from north boat ramp) .
[2]HS=hard snag (main branches only), PO=pine/conifer old growth, PS=pine/conifer 2nd growth, SC=snag, conifer.
[3]Direction from nest.
[4]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[5]CF=coniferous forest.

| Table 29. Bald eagle habitat use at the Crescent BA, Arizona, 2012. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Lake km[1] | PW[2,3] | PR | PP | PU | CL | PV | Total | Percent |
| 2.0 | 43 | – | – | – | – | – | 43 | 0.8 |
| 2.1 | 384 | – | 34 | – | – | – | 384 | 7.3 |
| 2.2 | 1,864 | 439 | 185 | 238 | 35 | – | 1,975 | 48.4 |
| 2.3 | 1,367 | 171 | 94 | – | – | 3 | 1,190 | 28.7 |
| 2.4 | 350 | 144 | 14 | – | – | – | 508 | 8.9 |
| 2.5 | 183 | 71 | – | – | – | – | 254 | 4.5 |
| 2.6 | 83 | – | – | – | – | – | 83 | 1.5 |
| Total | 4,274 | 825 | 327 | 238 | 35 | 3 | 5,702 | |
| Percent | 75.0 | 14.5 | 5.7 | 4.2 | 0.6 | 0.1 | | |

[1]Lake kilometer (clockwise from north boat ramp).
[2]Observation time (minutes).
[3]PW=perched watching, PR=perched roosting, PP=perched preening, PU=perched unknown, CL=perched close to mate, PV=perched vocalizing.

## APPENDIX H: GOLDFIELD BREEDING AREA SUMMARY

Table 30. Observed human activity and bald eagle behavior, Goldfield BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Kayak/canoe | 36 | 8 | – | – | – | 63 | – | 107 | 25.4 |
| Hiker | 12 | 9 | – | 1 | – | 8 | 39 | 69 | 16.4 |
| Helicopter | 9 | 23 | – | – | – | 2 | 30 | 64 | 15.2 |
| Gunshot | – | 9 | 43 | 2 | – | – | – | 54 | 12.8 |
| Horseback rider | 24 | 8 | – | – | – | – | 23 | 55 | 13.1 |
| Small plane | 12 | 10 | – | – | – | 3 | 10 | 35 | 8.3 |
| Apache helicopter | 4 | 15 | – | – | – | – | 8 | 27 | 6.4 |
| Boater | 4 | – | – | – | – | – | 2 | 6 | 1.4 |
| Agency vehicle | 1 | – | – | – | – | – | 1 | 2 | 0.5 |
| Military helicopter | – | 1 | – | – | – | – | – | 1 | 0.2 |
| Jet | – | 1 | – | – | – | – | – | 1 | 0.2 |
| Total | 102 | 84 | 43 | 3 | – | 76 | 113 | 421 | |

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

Table 31. Observed forage events and success, Goldfield BA, Arizona, 2012.

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

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

Table 32. Observed prey types delivered to the nest, Goldfield BA, Arizona, 2012.

| Sex | Fish | Mammals | Birds | Unknown | Total | Percent |
|---|---|---|---|---|---|---|
| Male | 4 | 2 | 1 | 3 | 10 | 40.0 |
| Female | 5 | – | – | 5 | 10 | 40.0 |
| Unknown | 3 | – | 1 | 1 | 5 | 20.0 |
| Total | 12 | 2 | 2 | 9 | 25 | |
| Percent | 48.0 | 8.0 | 8.0 | 36.0 | | |

Table 33. Observed prey species delivered to the nest, Goldfield BA, Arizona 2012.

| Sex | Fish | Mammals | | Birds | Total | Percent |
|---|---|---|---|---|---|---|
| | SU[1] | GS | RA | AC | | |
| Male | – | 1 | 1 | – | 2 | 50.0 |
| Unknown | 1 | – | – | 1 | 2 | 50.0 |
| Total | 1 | 1 | 1 | 1 | 4 | |
| Percent | 25.0 | 25.0 | 25.0 | 25.0 | | |

[1]SU=sucker (unknown species), GS=ground squirrel (unknown species), RA=rabbit (unknown species), AC=American coot.

Table 34. Bald eagle habitat analysis at the Goldfield BA, Arizona, 2012.

| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type[5] | Land Type[6] |
|---|---|---|---|---|---|---|
| 9.2 | WO | Left | No | 1 | RB | – |
| 9.5 | CL | Right | No | 1 | RB | WT |
| 9.8 | ST | Right | No | 1 | – | MB |
| 10.0 | CS | Right | No | 2 | – | MB |
| 10.1a | SG | Right | No | 1 | BW | WT |
| 10.1b | SG | Right | No | 2 | RU | WT |
| 10.1c | CL | Right | No | 2 | RU | WT |
| 10.1d | CM | Left | No | 2 | RU | MB |
| 10.1e | HS | Right | No | 2 | RU | MB/WT |
| 10.1f | HS | Right | No | 1 | – | WT |
| 10.1g | ST | Left | No | 2 | – | MB |
| 10.2 | CL | Right | No | 1 | BW | WT |
| 10.3 | CM | Right | No | 1 | PO | MB |
| 10.8 | CT | Right | No | 1 | PO | CL |
| 10.9 | HS | Right | No | 1 | PO | – |
| 12.4 | HS | Left | No | 1 | RI | MB |

[1]River kilometer (Hunt et. al. 1992).
[2]CL=cottonwood large (20-30+m), CM=cottonwood medium (10-20+m), CS=cottonwood small/0-10 m, CT=cliff top, HS=hard snag (main branches only), SG=soft snag (dead but branches still intact), ST=snag top, WO=willow.
[3]Side of river facing downstream.
[4]1=0-25m, 2 =26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[5]BW=backwater, PO=pool, RI=riffle, RU=run, RB=river bend.
[6]CL=cliff, MB=mesquite bosque, WT=willow thicket.

Table 35. Bald eagle habitat use at the Goldfield BA, Arizona, 2012.

| River km[1] | PW[2,3] | PP | PH | CL | PD | PS | PV | CO | PI | OT | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.2 | – | 40 | – | – | – | – | – | – | – | – | 40 | 0.3 |
| 9.5 | 1 | – | – | 3 | – | – | 4 | – | – | – | 8 | 0.1 |
| 9.8 | – | 18 | – | – | – | – | – | – | – | – | 18 | 0.1 |
| 10.0 | 28 | – | – | – | – | – | – | – | – | – | 28 | 0.2 |
| 10.1 | 1,789 | 304 | 186 | 178 | 4 | – | 68 | 65 | – | 21 | 2,615 | 20.9 |
| 10.2 | 8,299 | 497 | 148 | 119 | 290 | 214 | 106 | – | 34 | – | 9,707 | 77.5 |
| 10.3 | 3 | – | – | – | – | – | – | – | – | – | 3 | 0.0 |
| 10.8 | 25 | – | 23 | – | – | – | – | – | – | – | 48 | 0.4 |
| 10.9 | 13 | – | – | – | – | – | – | – | – | – | 13 | 0.1 |
| 12.4 | 53 | – | – | – | – | – | – | – | – | – | 53 | 0.4 |
| Total | 10,211 | 859 | 357 | 300 | 294 | 214 | 178 | 65 | 34 | 21 | 12,533 | |
| Percent | 81.5 | 6.9 | 2.8 | 2.4 | 2.3 | 1.7 | 1.4 | 0.5 | 0.3 | 0.2 | | |

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, PP=perched preening, PH=perched hunting, CL=perched close to mate, PD=perched drying, PS=perched shading, PV=perched vocalizing, CO=copulating, PI=perched interaction, OT=other (includes eating in tree, perched eating, perched with prey).

## APPENDIX I: LUNA BREEDING AREA SUMMARY

Table 36. Observed human activity and bald eagle behavior, Luna BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Angler | 507 | – | – | – | – | – | – | 507 | 39.5 |
| Boater - fishing | 215 | – | – | – | – | – | – | 215 | 16.7 |
| Canoe/kayak | 89 | – | – | – | – | – | – | 89 | 6.9 |
| Picnicker | 125 | – | – | – | – | – | – | 125 | 9.7 |
| Hiker | 42 | – | – | – | – | – | – | 42 | 3.3 |
| Driver | 111 | – | 1 | – | – | – | – | 112 | 8.7 |
| Birder | 100 | – | – | – | – | – | – | 100 | 7.8 |
| Bicycle | 12 | – | – | – | – | – | – | 12 | 0.9 |
| Agency worker | 25 | – | 2 | – | 3 | – | – | 30 | 2.3 |
| Float tuber | 20 | – | – | – | – | – | – | 20 | 1.6 |
| Swimmer | 6 | – | – | – | – | – | – | 6 | 0.5 |
| Photographer | 12 | – | – | – | – | – | – | 12 | 0.9 |
| Camper | 1 | 1 | – | – | – | – | – | 2 | 0.2 |
| Gunshot | 4 | – | – | – | – | – | – | 4 | 0.3 |
| Military jet | 4 | – | – | – | – | – | – | 4 | 0.3 |
| Helicopter | 2 | – | – | 1 | – | – | – | 3 | 0.2 |
| Small plane | 2 | – | – | – | – | – | – | 2 | 0.2 |
| Total | 1,277 | 1 | 3 | 1 | 3 | – | – | 1,285 | |

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

Table 37. Observed forage events and success, Luna BA, Arizona, 2012.

| Sex | Fish | | Birds | | Carrion | | Total | |
|---|---|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U | E | S-U |
| Male | 23 | 23-0 | 15 | 13-2 | 2 | 2-0 | 40 | 38-2 |
| Female | 17 | 17-0 | 10 | 7-3 | – | – | 27 | 24-3 |
| Total | 40 | 40-0 | 25 | 20-5 | 2 | 2-0 | 67 | 62-5 |

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

Table 38. Observed prey types delivered to the nest, Luna BA, Arizona, 2012.

| Sex | Fish | Bird | Mammals | Total | Percent |
|---|---|---|---|---|---|
| Male | 22 | 14 | 2 | 38 | 64.4 |
| Female | 16 | 5 | – | 21 | 35.6 |
| Total | 38 | 19 | 2 | 59 | |
| Percent | 64.4 | 28.8 | 3.4 | | |

Table 39. Observed prey species delivered to the nest, Luna BA, Arizona 2012.

| Sex | Fish | Birds | | Mammals | Total | Percent |
|---|---|---|---|---|---|---|
| | RT[1] | AC | CG | RS | | |
| Male | 22 | 12 | 2 | 2 | 38 | 64.4 |
| Female | 16 | 5 | – | – | 21 | 35.6 |
| Total | 38 | 17 | 2 | 2 | 59 | |
| Percent | 64.4 | 28.8 | 3.4 | 3.4 | | |

[1]RT= rainbow trout, AC=American coot, CG=Canada goose, RS=rabbit species.

Table 40. Bald eagle habitat analysis at the Luna BA, Arizona, 2012.

| Perch Location[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 0.3 | PS | – | No | 1 | RS | CF |
| 0.5 | SH | – | No | 2 | RC | CF |
| 0.9 | SH | – | No | 2 | RC | CF |
| 1.4 | PS | – | Yes | 1 | RC | CF |
| 1.7 | PS | – | Yes | 1 | RC | CF |
| 1.8 | PS | – | Yes | 1 | RC | CF |
| 2.0 | SH | – | Yes | 8 | – | CF |
| 2.1 | PO | – | No | 7 | – | CF |
| 2.2 | SH | – | No | 7 | – | CF |
| 2.3 | PO | – | Partial | 7 | – | CF |
| 2.4a | SH | – | No | 7 | – | CF |
| 2.4b | PS | – | Yes | 7 | – | CF |
| 2.5 | PS | – | No | 2 | – | CF |
| 2.6a | WF | – | No | 1 | RS | CF |
| 2.6b | SC | – | No | 6 | – | CF |
| 2.7 | PS | – | No | 2 | RS | CF |
| 2.8 | SH | – | Yes | 7 | – | CF |
| 3.0 | PS | – | Yes | 2 | – | CF |
| 3.5 | ST | – | No | 2 | RC | CF |
| 4.5 | FP | – | No | 1 | RC | CF |
| 4.6 | PS | – | No | 1 | RC | CF |
| 5.1 | FP | – | No | 1 | RC | CF |

[1]Lake kilometer (counterclockwise from boat ramp).
[2]FP=fence post, PO=Pine/Conifer, old growth/20-30+ m, PS=pine/conifer 2nd growth, SC=snag conifer, SH=hard snag (main branches only), ST=snag top, WF=waterfowl closure sign.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]RS=reservoir main body, RC=reservoir cove.
[5]CF=coniferous forest.

| Table 41. Bald eagle habitat use at the Luna BA, Arizona, 2012. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| River km[1] | PW[2,3] | PH | PR | PK | PV | PP | Total | Percent |
| 0.1 | 30 | – | – | – | – | – | 30 | 0.1 |
| 0.2 | 45 | 19 | – | – | – | – | 64 | 0.2 |
| 1.4 | 216 | 50 | – | – | – | – | 266 | 0.7 |
| 2.1 | 40 | – | – | – | – | – | 40 | 0.1 |
| 2.2 | 2,265 | – | – | – | – | – | 2,265 | 5.7 |
| 2.3 | 98 | – | – | 3 | – | – | 101 | 0.3 |
| 2.4 | 22,847 | – | 165 | – | 127 | 42 | 23,181 | 58.8 |
| 2.5 | 993 | – | – | – | – | – | 993 | 2.5 |
| 2.6 | 2,548 | 504 | – | 128 | 15 | – | 3,195 | 8.1 |
| 2.7 | 5,329 | 2,478 | – | – | – | 28 | 7,835 | 19.9 |
| 2.8 | – | 44 | – | 62 | – | – | 106 | 0.3 |
| 3.0 | 259 | 307 | – | – | – | – | 566 | 1.4 |
| 3.5 | 42 | 15 | – | – | – | – | 57 | 0.1 |
| 4.0 | 5 | 36 | – | – | – | – | 41 | 0.1 |
| 4.3 | 260 | 10 | – | – | – | – | 270 | 0.7 |
| 4.5 | – | 66 | – | – | – | – | 66 | 0.2 |
| 4.9 | – | 11 | – | – | – | 2 | 13 | 0.1 |
| 5.1 | 154 | 126 | – | – | – | 21 | 301 | 0.8 |
| 5.3 | 18 | – | – | – | – | – | 18 | 0.1 |
| Total | 35,149 | 3,666 | 165 | 193 | 142 | 93 | 39,408 | |
| Percent | 89.2 | 9.3 | 0.4 | 0.5 | 0.4 | 0.2 | | |

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, PR=perched roosting, PK=perched with prey, PV=perched vocalizing, PP=perched preening,

## APPENDIX J: ORME BREEDING AREA SUMMARY

| Table 42. Observed human activity and bald eagle behavior, Orme BA, Arizona 2012. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
| Helicopter | 44 | 34 | 1 | 1 | – | 8 | 29 | 117 | 22.2 |
| Driver (vehicle) | 26 | 51 | 1 | 2 | – | 11 | 26 | 117 | 22.2 |
| Hiker | 31 | 7 | – | 2 | – | – | 9 | 49 | 9.3 |
| Agency worker | 9 | 23 | – | 1 | – | 7 | 7 | 48 | 9.1 |
| Fisherman | 32 | 6 | – | 1 | – | – | 6 | 45 | 8.6 |
| Helicopter, Apache | 13 | 25 | – | – | – | 5 | – | 43 | 8.2 |
| Small Plane | 4 | 7 | – | 1 | – | – | 3 | 15 | 2.9 |
| Photographer | 4 | 8 | – | 1 | – | – | – | 13 | 2.5 |
| Birder | 7 | 1 | – | – | – | 2 | 2 | 12 | 2.3 |
| Helicopter, Sheriff | 4 | 5 | 1 | – | – | 1 | 1 | 12 | 2.3 |
| Picnicker | 9 | 1 | – | – | – | – | 1 | 11 | 2.1 |
| Gunshot | 4 | 1 | – | 2 | – | – | 3 | 10 | 1.9 |
| Swimmer | – | 3 | – | 2 | – | – | – | 5 | 1.0 |
| Dog (rancher) | 2 | 2 | – | 1 | – | – | – | 5 | 1.0 |
| Picnicker | 1 | 2 | – | 1 | – | – | – | 4 | 0.8 |
| AGFD | 1 | – | 2 | – | 1 | – | 1 | 4 | 0.8 |
| Camper | 2 | – | – | – | – | – | 1 | 3 | 0.6 |
| Cyclist | 2 | 1 | – | – | – | – | – | 3 | 0.6 |
| Sonic Boom | 2 | 1 | – | – | – | – | – | 3 | 0.6 |
| Hunter | – | 2 | – | – | – | – | – | 2 | 0.4 |
| Canoe/Kayak | 1 | – | – | – | – | – | – | 1 | 0.2 |
| Cattle (rancher) | 1 | – | – | – | – | – | – | 1 | 0.2 |
| Helicopter, military | 1 | – | – | – | – | – | – | 1 | 0.2 |
| OHV | – | 1 | – | – | – | – | – | 1 | 0.2 |
| Motorized parachute | – | 1 | – | – | – | – | – | 1 | 0.2 |
| Total | 200 | 182 | 5 | 15 | 1 | 34 | 87 | 526 | |

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

| Table 43. Observed forage events and success, Orme BA, Arizona, 2012. | | | | |
|---|---|---|---|---|
| Sex | Unknown prey | | Total | |
| | E[1] | S-U[2] | E | S-U |
| Male | 4 | 1-3 | 4 | 1-3 |
| Female | 1 | 1-0 | 1 | 1-0 |
| Unknown | 3 | 1-2 | 3 | 1-2 |
| Total | 8 | 3-5 | 8 | 3-5 |

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

| Table 44. Observed prey types delivered to the nest, Orme BA, Arizona, 2012. | | | | | |
|---|---|---|---|---|---|
| Sex | Fish | Bird | Unknown | Total | Percent |
| Male | 4 | 1 | 7 | 12 | 57.1 |
| Female | 3 | – | 6 | 9 | 42.9 |
| Total | 7 | 1 | 13 | 21 | |
| Percent | 33.3 | 4.8 | 61.9 | | |

Table 45. Observed prey species delivered to the nest, Orme BA, Arizona 2012.

| Sex | Fish | | | Total | Percent |
|---|---|---|---|---|---|
| | CS[1] | SU | RT | | |
| Male | 1 | 1 | 2 | 4 | 57.1 |
| Female | 2 | 1 | – | 3 | 42.9 |
| Total | 3 | 2 | 2 | 7 | |
| Percent | 42.9 | 28.6 | 28.6 | | |

[1]CS=catfish species, SU=sucker species, RT=rainbow trout.

Table 46. Bald eagle habitat analysis at the Orme BA, Arizona, 2012 (continued next page).

| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type[5] | Land Type[6] |
|---|---|---|---|---|---|---|
| V 0.4 | HS | Left | Partial | 1 | – | MB |
| V 0.5a | SG | Right | Partial | 6 | – | CW |
| V 0.5b | CS | Right | Yes | 5 | – | CW |
| V 0.6a | SM | Left | Partial | 1 | RU | MB |
| V 0.6b | SG | Left | Partial | 5 | – | CW |
| V 0.6c | HS | Left | No | 1 | RU | WT |
| V 0.7a | WO | Left | Yes | 1 | RU | WT |
| V 0.7b | SG | Right | No | 4 | RU | TX |
| V 0.7c | SG | Right | Partial | 3 | RU | TX |
| V 0.7d | SM | Left | Partial | 3 | RU | WT |
| V 0.7e | HS | Left | Partial | 1 | – | MB |
| V 0.7f | BO | Right | Partial | 1 | RU | SO |
| V 0.7g | SG | Right | Partial | 1 | RU | WT |
| V 0.7h | SG | Right | Yes | 4 | – | TX |
| V 0.8a | SM | Left | Partial | 2 | – | TX |
| V 0.8b | BO | Right | No | 1 | RU | SO |
| V 0.8c | CC | Left | No | 1 | RU | UP |
| V 0.9a | SM | Left | Partial | 1 | RU | SO |
| V 0.9b | HS | Left | Partial | 1 | RU | SO |
| V 0.9c | CC | Left | No | 0-25 | RU | SO |
| V 1.0 | SG | – | Partial | 1 | – | WT |
| S 4.8a | ST | Right | Partial | 5 | – | CW |
| S 4.8b | HS | Right | Partial | 4 | – | CW |
| S 5.0 | SG | Right | Partial | 4 | – | TX |
| S 5.1 | SG | Left | Partial | 5 | PW | MB |
| S 6.2a | SG | Right | Partial | 4 | RU | TX |
| S 6.2b | SG | Right | Partial | 4 | RU | TX |
| S 7.0a | BO | Left | Partial | 4 | – | UP |
| S 7.0b | CF | Left | Partial | 1 | RU | CW |
| S 7.0c | SG | Left | Partial | 1 | RU | WT |

[1]River kilometer (Hunt et. al. 1992). V=Verde River. S=Salt River

[2]BO=boulder, CC=cactus, CF=cliff ledge, CM=cottonwood medium (10-20m), CS=cottonwood small (0-10m), HS=hard snag (main branches only), SG=soft snag (dead but branches still intact), SM=snag, mesquite, ST=snag top, WO=willow.

[3]Side of river facing downstream.

[4]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.

[5]PW=pocket water, RU=run.

[6]CW=cottonwood grove, MB=mesquite bosque, SO=shore, TX=tamarisk thicket, UP=desert upland, WT=willow thicket.

Table 46 continued.

| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type[5] | Land Type[6] |
|---|---|---|---|---|---|---|
| S 7.3 | SG | Right | Partial | 5 | – | TX |
| S 7.5a | HS | – | Partial | 5 | – | TX |
| S 7.5b | CM | – | Partial | 5 | – | TX |
| S 9.0a | SM | Right | Partial | – | – | TX |
| S 9.0b | SM | – | Partial | – | – | MB |
| S 9.8 | ST | – | Partial | – | – | CW |

[1]River kilometer (Hunt et. al. 1992). S=Salt River
[2]CM=cottonwood medium (10-20m), HS=hard snag (main branches only), SM=snag, mesquite, ST=snag top.
[3]Side of river facing downstream.
[4]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[5]PW=pocket water, RU=run.
[6]CW=cottonwood grove, MB=mesquite bosque, TX=tamarisk thicket.

Table 47. Bald eagle habitat use at the Orme BA, Arizona, 2012 (continued next page).

| River km[1] | PW[2,3] | PH | PX | PP | PD | PU | PV | CL | PE | OT | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V 0.2 | 28 | – | – | 10 | – | 1 | – | – | – | – | 39 | 0.1 |
| V 0.4 | 18 | 145 | – | – | – | – | – | – | – | – | 163 | 0.6 |
| V 0.5 | 4 | – | 5 | – | – | – | 2 | – | – | 11 | 22 | 0.1 |
| V 0.6 | 2,835 | 2,199 | 517 | 341 | 151 | – | 24 | 5 | 11 | 38 | 6,121 | 23.5 |
| V 0.7 | 12,781 | 158 | 968 | 822 | 439 | 1 | 167 | 46 | – | 32 | 15,414 | 59.1 |
| V 0.8 | 6 | – | – | – | – | – | – | – | – | 2 | 8 | 0.1 |
| V 0.9 | 982 | 1,591 | 1 | 18 | 91 | – | – | – | 6 | – | 2,689 | 10.3 |
| V 1.0 | 1 | – | – | – | – | – | – | – | – | 12 | 13 | 0.1 |
| V 1.1 | 3 | 5 | – | 6 | – | – | – | – | – | – | 14 | 0.1 |
| V 1.2 | – | 2 | – | – | – | – | – | – | – | 2 | 4 | 0.1 |
| S 4.6 | 1 | 41 | – | 3 | – | – | 1 | – | – | – | 45 | 0.2 |
| S 4.8 | 33 | 4 | – | 5 | – | – | – | – | – | – | 9 | 0.2 |
| S 4.9 | – | 4 | – | – | – | – | – | – | – | – | 4 | 0.1 |
| S 5.0 | 6 | 3 | – | – | – | – | – | – | – | – | 3 | 0.1 |
| S 5.1 | 164 | 297 | – | – | – | 7 | – | – | – | – | 304 | 1.8 |
| S 5.6 | – | 5 | – | – | – | – | – | – | – | – | 5 | 0.1 |
| S 5.7 | – | 14 | – | – | – | 2 | – | – | – | – | 16 | 0.1 |
| S 5.9 | – | 6 | – | – | – | – | – | – | – | – | 6 | 0.1 |
| S 6.2 | 136 | 104 | 38 | – | – | – | – | – | – | 8 | 150 | 1.1 |
| S 6.4 | – | 6 | – | – | – | – | – | – | – | 6 | 12 | 0.1 |
| S 6.6 | 69 | – | – | – | – | – | – | – | 26 | – | 26 | 0.4 |
| S 7.0 | 39 | 126 | 14 | – | – | 137 | – | – | – | 1 | 278 | 1.2 |
| S 7.3 | – | 70 | – | – | – | 20 | – | – | – | 3 | 93 | 0.4 |
| S 7.5 | – | 8 | 4 | – | – | 28 | – | – | – | – | 40 | 0.2 |
| S 7.6 | – | 9 | – | – | – | – | – | – | – | – | 9 | 0.1 |
| S 8.0 | – | – | – | – | – | – | – | – | 10 | – | 10 | 0.1 |
| S 8.3 | – | – | 7 | – | – | – | – | – | – | – | 7 | 0.1 |

[1]River kilometer (Hunt et al. 1992). V=Verde River, S=Salt River.
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, PX=perched, various, PP=perched preening, PD=perched drying, PU=perched unknown, PV=perched vocalizing, CL=perched close to mate, PE=perched eating, OT=other (includes perched interaction, perched with prey, gathering nest materials, standing in water, drinking water, copulating).

Table 47 continued.

| River km[1] | PW[2,3] | PH | PX | PP | PD | PU | PV | CL | PE | OT | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S 8.7 | – | – | – | – | – | 40 | – | – | – | – | 40 | 0.2 |
| S 8.9 | – | 1 | – | – | – | – | – | – | – | – | 1 | 0.1 |
| S 9.0 | – | 67 | – | – | – | 10 | – | – | – | – | 77 | 0.3 |
| S 9.2 | – | 2 | – | – | – | – | – | – | – | – | 2 | 0.1 |
| S 9.3 | – | – | – | – | – | 6 | – | – | – | – | 6 | 0.1 |
| S 9.5 | – | – | – | – | – | 2 | – | 3 | – | – | 5 | 0.1 |
| S 9.8 | – | – | – | – | – | – | – | 3 | – | – | 3 | 0.1 |
| Total | 17,106 | 4,867 | 1,554 | 1,205 | 681 | 254 | 194 | 57 | 53 | 115 | 26,086 | |
| Percent | 65.6 | 18.7 | 6.0 | 4.6 | 2.6 | 1.0 | 0.7 | 0.2 | 0.2 | 0.4 | | |

[1]River kilometer (Hunt et al. 1992). S=Salt River.

[2]Observation time (minutes).

[3]PW=perched watching, PH=perched hunting, PX=perched, various, PP=perched preening, PD=perched drying, PU=perched unknown, PV=perched vocalizing, CL=perched close to mate, PE=perched eating, OT=other (includes perched interaction, perched with prey, gathering nest materials, standing in water, drinking water, copulating).

## APPENDIX K: PINTO BREEDING AREA SUMMARY

Table 48. Observed human activity and bald eagle behavior, Pinto BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Agency Worker | 3 | 3 | – | 1 | – | 1 | – | 8 | 16.0 |
| Hiker | 6 | 1 | – | – | – | – | – | 7 | 14.0 |
| Driver | 5 | 1 | – | – | – | – | – | 6 | 12.0 |
| Helicopter | 2 | 3 | – | – | 1 | – | – | 6 | 12.0 |
| Small plane | 4 | – | – | – | – | – | – | 4 | 8.0 |
| OHV | 4 | – | – | – | – | – | – | 4 | 8.0 |
| AGFD Researcher | – | – | – | 1 | 1 | 1 | – | 3 | 6.0 |
| Helicopter, Apache | 3 | – | – | – | – | – | – | 3 | 6.0 |
| Fisherman | 2 | – | – | – | – | – | – | 2 | 4.0 |
| Boater | 1 | – | – | – | – | – | 1 | 2 | 4.0 |
| Large plane | – | 1 | – | – | – | – | – | 1 | 2.0 |
| Shooter | – | 1 | – | – | – | – | – | 1 | 2.0 |
| Canoe | 1 | – | – | – | – | – | – | 1 | 2.0 |
| Picnicker | 1 | – | – | – | – | – | – | 1 | 2.0 |
| Helicopter, Other military | – | 1 | – | – | – | – | – | 1 | 2.0 |
| Total | 32 | 11 | – | 2 | 2 | 2 | 1 | 50 | |

[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, Pinto BA, Arizona, 2012.

| Sex | Fish | | Reptiles | | Total | |
|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U |
| Male | 1 | 1-0 | – | – | 1 | 1-0 |
| Female | – | – | 1 | 1-0 | 1 | 1-0 |
| Total | 1 | 1-0 | 1 | 1-0 | 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 50. Observed prey types delivered to the nest, Pinto BA, Arizona, 2012.

| Sex | Fish | Reptiles | Total | Percent |
|---|---|---|---|---|
| Male | 1 | – | 1 | 33.3 |
| Unknown | 1 | 1 | 2 | 66.7 |
| Total | 2 | 1 | 3 | |
| Percent | 66.7 | 33.3 | | |

Table 51. Bald eagle habitat analysis at the Pinto BA, Arizona, 2012.

| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type[5] | Land Type[6] |
|---|---|---|---|---|---|---|
| 99.9 | SG | Left | No | 4 | IF | DB |
| 100.8a | SG | Left | No | 1 | RB | DB |
| 100.8b | ST | Left | No | I | RB | DB |
| 100.9 | HS | Right | No | 1 | RB | DB |
| 101.9 | CT | Right | No | 1 | RU | UP |
| 102.0 | ST | Left | No | 7 | RU | DB |
| 102.7 | HS | Left | No | 8 | RU | UP |
| 103.0 | CT | Right | No | 4 | RI | CL |
| 103.3 | CF | Right | No | 1 | RI | TA |
| 103.4 | SS | Right | No | 1 | RB | DB |
| 103.7 | HS | Left | No | 7 | RU | DB |
| 104.0 | SG | Right | No | 2 | RU | DB |
| 104.2 | HS | Right | No | 8 | RI | DB |
| 104.3a | SO | Left | No | 1 | RI | SO |
| 104.3b | SG | Right | No | 1 | RI | DB |
| 104.3c | SG | Right | No | 2 | RI | DB |
| 104.4a | SO | Left | No | 1 | RI | SO |
| 104.4b | SB | Middle | No | 1 | RI | SO |
| 104.4c | SG | Right | No | 2 | RI | DB |
| 104.4d | HS | Right | No | 3 | RI | DB |
| 104.5a | SO | Left | No | 1 | RU | SO |
| 104.5b | HS | Right | No | 4 | RU | DB |
| 104.5c | HS | Right | No | 6 | RU | DB |
| 104.5d | SG | Right | No | 6 | RU | DB |
| 104.6a | HS | Right | No | 6 | RU | DB |
| 104.6b | HS | Right | No | 8 | RU | DB |
| 104.6c | SS | Right | No | 4 | RU | DB |
| 104.7 | HS | Right | No | 8 | RU | DB |
| 105.0 | HS | Right | No | 8 | RU | DB |
| 105.1 | SG | Left | No | 1 | RU | UP |

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff face, CT=cliff top, HS=hard snag (main branches only), SB=sand bar, SG=soft snag (dead but branches still intact), SO=shore, SS=snag shrub, ST=snag top.
[3]Side of river facing downstream.
[4]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[5]IF=inflow of reservoir, PO=pool, RB=river bend, RI=riffle, RU=run.
[6]CL=cliff , DB=dead mesquite bosque, SO=shore, TA=talus, UP=upland desert.

Table 52. Bald eagle habitat use at the Pinto BA, Arizona, 2012.

| River km[1] | PW[2,3] | PP | PD | PH | ET | DW | PV | GN | CL | PK | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 99.9 | 45 | – | – | – | – | – | – | – | – | – | 45 | 1.7 |
| 100.8 | 12 | – | – | 12 | – | – | – | – | – | 2 | 26 | 1.0 |
| 100.9 | 34 | – | – | – | – | – | – | – | – | – | 34 | 1.3 |
| 101.9 | 1 | – | – | – | – | – | – | – | – | – | 1 | 0.1 |
| 102.0 | 6 | – | – | – | – | – | – | – | – | – | 6 | 0.2 |
| 102.7 | 1 | – | – | – | – | – | – | – | – | – | 1 | 0.1 |
| 103.0 | 49 | – | – | – | – | – | – | – | – | – | 49 | 1.9 |
| 103.3 | – | – | – | 47 | – | – | – | – | – | – | 47 | 1.8 |
| 103.4 | – | – | – | 7 | – | – | – | – | – | – | 7 | 0.3 |
| 103.7 | 57 | 7 | – | – | 7 | – | – | – | – | 1 | 72 | 2.8 |
| 104.0 | 5 | – | – | – | – | – | – | – | – | – | 5 | 0.2 |
| 104.2 | 7 | – | – | – | – | – | – | – | – | – | 7 | 0.3 |
| 104.3 | 2 | – | – | – | – | – | – | – | – | – | 2 | 0.1 |
| 104.4 | 900 | 204 | 58 | – | 15 | 22 | 3 | 7 | 12 | – | 1,221 | 47.1 |
| 104.5 | 355 | 138 | 62 | 49 | – | 4 | 14 | – | – | – | 622 | 24.0 |
| 104.6 | 277 | 78 | 1 | – | 12 | – | 4 | 3 | – | – | 375 | 14.5 |
| 104.7 | 17 | – | – | – | – | – | – | 3 | – | – | 20 | 0.8 |
| 105.0 | 51 | – | – | – | – | – | 1 | – | – | – | 52 | 2.0 |
| 105.1 | 1 | – | – | – | – | – | – | – | – | – | 1 | 0.1 |
| Total | 1,820 | 427 | 121 | 115 | 34 | 26 | 22 | 13 | 12 | 3 | 2,593 | |
| Percent | 70.4 | 16.4 | 4.7 | 4.4 | 1.3 | 1.0 | 0.8 | 0.5 | 0.4 | 0.1 | | |

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, PP=perched preening, PD=perched drying, PH=perched hunting, ET=eating in tree, DW=drinking water, PV=perched vocalizing, GN=gathering nesting material, CL=perched close to mate, PK=perched with prey.

## APPENDIX L: RODEO BREEDING AREA SUMMARY

Table 53. Observed human activity and bald eagle behavior, Rodeo BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Gunshots | 2,303 | – | – | – | – | – | – | 2,303 | 92.9 |
| Driver/Police car | 33 | 29 | – | 1 | – | 2 | – | 65 | 2.6 |
| Helicopter | 35 | 8 | – | – | 1 | 4 | – | 48 | 1.9 |
| Helicopter, Apache | 21 | 4 | – | – | – | 1 | – | 26 | 1.0 |
| Small plane | 12 | 5 | – | – | – | – | – | 17 | 0.7 |
| Hiker | 6 | 6 | – | – | – | – | – | 12 | 0.5 |
| Helicopter, Sheriff | 1 | 1 | – | – | – | 1 | – | 3 | 0.1 |
| Helicopter, Military | 2 | – | – | – | – | – | – | 2 | 0.1 |
| Horseback rider | – | 1 | – | – | – | – | – | 1 | 0.1 |
| OHV | – | 1 | – | – | – | – | – | 1 | 0.1 |
| Total | 2,413 | 55 | – | 1 | 1 | 8 | – | 2,478 | |

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

Table 54. Observed prey types delivered to the nest, Rodeo BA, Arizona, 2012.

| Sex | Fish | Carrion | Total | Percent |
|---|---|---|---|---|
| Male | 20 | 3 | 23 | 46.9 |
| Female | 23 | 3 | 26 | 53.1 |
| Total | 43 | 6 | 49 | |
| Percent | 87.8 | 12.2 | | |

Table 55. Observed prey species delivered to the nest, Rodeo BA, Arizona 2012.

| Sex | Fish | | Total | Percent |
|---|---|---|---|---|
| | SU[1] | CP | | |
| Male | 4 | 5 | 9 | 60.0 |
| Female | 3 | 3 | 6 | 40.0 |
| Total | 7 | 8 | 15 | |
| Percent | 46.7 | 53.3 | | |

[1]SU=sucker species, CP=common carp.

Table 56. Bald eagle habitat analysis at the Rodeo BA, Arizona, 2012.

| Perch Location[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 2.5 | CT | Left | Partial | 2 | PO | CL |
| 2.6 | CS | Right | No | 1 | PO | CW |
| 2.7 | CS | Left | No | 1 | PO | CW |
| 3.5 | CM | Left | No | 2 | PO | CL |
| 3.7 | CM | Left | Partial | 4 | PO | CW |
| 3.8a | ST | Left | No | 5 | PO | CW |
| 3.8b | CM | Left | No | 5 | PO | CW |
| 3.8c | HS | Left | No | 5 | PO | CW |
| 3.8d | CM | Left | No | 5 | PO | CW |
| 3.8e | SP | Left | No | 5 | PO | CW |
| 3.9 | CM | Left | No | 4 | PO | CW |
| 4.0 | CM | Right | No | 1 | PO | MB |
| 4.2 | CM | Right | No | 1 | PO | MB |

[1]River kilometer (Hunt et. al. 1992).
[2]CT=cliff top, CM=cottonwood medium (10-20m), CS=cottonwood snag, HS=hard snag (main branches only), SP=stump, 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=>400m.
[4]PO=pool.
[5]CL=cliff ledge, CW=cottonwood grove, MB=mesquite bosque.

Table 57. Bald eagle habitat use at the Rodeo BA, Arizona, 2012.

| River km[1] | PW[2,3] | PH | PP | CL | PK | Total | Percent |
|---|---|---|---|---|---|---|---|
| 2.5 | 42 | 622 | – | – | – | 664 | 4.7 |
| 2.6 | 13 | – | – | – | – | 13 | 0.1 |
| 2.7 | 8 | – | – | – | – | 8 | 0.1 |
| 3.5 | 5 | – | – | – | – | 5 | 0.1 |
| 3.7 | 80 | – | – | – | – | 80 | 0.6 |
| 3.8 | 9,535 | 152 | 615 | 301 | 12 | 10,615 | 75.6 |
| 3.9 | 27 | – | – | – | – | 27 | 0.2 |
| 4.0 | 78 | – | – | – | – | 78 | 0.6 |
| 4.2 | 317 | 2,184 | 40 | 10 | – | 2,551 | 18.2 |
| Total | 10,105 | 2,958 | 655 | 311 | 12 | 14,041 | |
| Percent | 72.0 | 21.1 | 4.7 | 2.2 | 0.1 | | |

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, PP=perched preening, CL=perched close to mate, PK=perched with prey.

## APPENDIX M: SHOW LOW LAKE BREEDING AREA SUMMARY

Table 58. Observed human activity and bald eagle behavior, Show Low Lake BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Fisherpeople | 171 | – | – | – | – | 1 | 11 | 183 | 49.1 |
| Fishing by boat | 46 | 3 | – | – | – | – | 7 | 56 | 15.0 |
| Partier | 36 | – | – | – | – | – | 4 | 40 | 10.7 |
| Hikers | 25 | 5 | – | 1 | – | – | – | 31 | 8.3 |
| Canoe/kayak | 13 | 4 | – | – | – | – | 1 | 18 | 4.8 |
| Boater | 10 | 4 | – | – | – | – | – | 14 | 3.8 |
| Tuber | 0 | 12 | – | – | – | – | – | 12 | 3.2 |
| Gunshot | 1 | 7 | – | – | – | – | – | 8 | 2.1 |
| Driver | 3 | – | – | – | – | – | – | 3 | 0.8 |
| Rafter | 2 | – | – | – | – | – | – | 2 | 0.5 |
| Helicopter, military | – | – | – | – | – | – | 2 | 2 | 0.5 |
| OHV | 2 | – | – | – | – | – | – | 2 | 0.5 |
| Helicopter | 1 | – | – | – | – | – | – | 1 | 0.3 |
| Bicyclist | 1 | – | – | – | – | – | – | 1 | 0.3 |
| Total | 311 | 35 | – | 1 | – | 1 | 25 | 373 | |

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

Table 59. Observed prey types delivered to the nest, Show Low Lake BA, Arizona, 2012.

| Sex | Fish | Unknown | Total | Percent |
|---|---|---|---|---|
| Unknown | 1 | 2 | 3 | 100 |
| Total | 1 | 2 | 3 | |
| Percent | 33.3 | 66.7 | | |

Table 60. Bald eagle habitat analysis at the Show Low Lake BA, Arizona, 2012.

| Perch Location[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 1.6 | PS | Right | No | 2 | RS | CF |
| 2. a | ST | Right | No | 2 | RS | CL |
| 2.2b | SC | Right | No | 2 | RS | CF |
| 2.3a | SG | Right | No | 2 | RS | CF |
| 2.3b | SC | Right | No | 1 | RS | CF |
| 2.4a | PO | Right | Yes | 2 | RS | CF |
| 2.4b | PO | Right | No | 1 | RS | CF |
| 2.4c | SG | Right | No | 2 | RS | CF |
| 2.4d | SG | Right | No | 2 | RS | CF |
| 2.45 | PO | Right | Partial | 2 | RS | CF |
| 2.5a | HS | Right | No | 1 | RS | CF |
| 2.5b | PO | Right | No | 1 | RS | CF |
| 2.5c | SC | Right | No | 2 | RS | CL |

[1]Lake kilometer (clockwise from middle of dam).
[2]HS=hard snag (main branches only), PO=pine/conifer, old growth/20-30+ m., PS=pine/second growth 10-20m, SC=snag, conifer, SG=soft snag (dead but branches still intact), 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]RS=reservoir main body.
[5]CL=cliff, CF=conifer forest.

Table 61. Bald eagle habitat use at the Show Low Lake BA, Arizona, 2012.

| Lake km[1] | PW[2,3] | PP | PH | PK | ET | PX | Total | Percent |
|---|---|---|---|---|---|---|---|---|
| 1.6 | 281 | – | – | – | – | – | 281 | 19.1 |
| 2.2 | 22 | – | 5 | – | – | – | 27 | 1.8 |
| 2.3 | 438 | 24 | 2 | – | 7 | 6 | 477 | 32.3 |
| 2.4 | 238 | 5 | – | – | – | – | 243 | 16.5 |
| 2.45 | 76 | – | – | – | – | – | 76 | 5.2 |
| 2.5 | 309 | 42 | 11 | 9 | – | – | 371 | 25.2 |
| Total | 1,364 | 71 | 18 | 9 | 7 | 6 | 1,475 | |
| Percent | 92.5 | 4.8 | 1.2 | 0.6 | 0.5 | 0.4 | | |

[1]Lake kilometer (clockwise from middle of dam).
[2]Observation time (minutes).
[3]PW=perched watching, PP=perched preening, PH=perched hunting, PK= perched with prey, ET=eating in tree, PX=perched with stick.

## APPENDIX N: SYCAMORE BREEDING AREA SUMMARY

Table 62. Observed human activity and bald eagle behavior, Sycamore BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Horseback riders | 113 | 4 | – | – | – | 10 | – | 127 | 48.5 |
| OHV | 21 | 11 | – | 1 | – | – | – | 33 | 12.6 |
| Driver | 21 | 9 | – | – | – | 3 | – | 33 | 12.6 |
| Small plane | 18 | 5 | – | – | – | 2 | – | 25 | 9.5 |
| Helicopter | 15 | 3 | – | – | 1 | 4 | – | 23 | 8.8 |
| Helicopter, Apache | 13 | 3 | – | – | – | 1 | – | 17 | 6.5 |
| Farmer | 1 | 1 | – | – | – | – | – | 2 | 0.7 |
| Rancher | – | – | – | – | – | 1 | – | 1 | 0.4 |
| Gunshot | 1 | – | – | – | – | – | – | 1 | 0.4 |
| Total | 203 | 36 | – | 1 | 1 | 21 | – | 262 | |

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

Table 63. Observed forage events and success, Sycamore BA, Arizona, 2012.

| Sex | Fish | | Birds | | Total | |
|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U |
| Male | – | – | 1 | 1-0 | 1 | 1-0 |
| Female | 1 | 1-0 | – | – | 1 | 1-0 |
| Total | 1 | 1-0 | 1 | 1-0 | 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 64. Observed prey types delivered to the nest, Sycamore BA, Arizona, 2012.

| Sex | Fish | Mammals | Birds | Unknown | Total | Percent |
|---|---|---|---|---|---|---|
| Male | 16 | 5 | 3 | 19 | 43 | 65.2 |
| Female | 18 | 3 | – | 2 | 23 | 34.8 |
| Total | 34 | 8 | 3 | 21 | 66 | |
| Percent | 51.5 | 12.1 | 4.6 | 31.8 | | |

Table 65. Observed prey species delivered to the nest, Sycamore BA, Arizona 2012.

| Sex | Fish | | | Mammals | | Birds | Total | Percent |
|---|---|---|---|---|---|---|---|---|
| | RT[1] | SU | CP | JK | GS | GW | | |
| Male | – | – | – | 2 | 1 | 1 | 4 | 36.4 |
| Female | 3 | 2 | 2 | – | – | – | 7 | 63.6 |
| Total | 3 | 2 | 2 | 2 | 1 | 1 | 11 | |
| Percent | 27.2 | 18.2 | 18.2 | 18.2 | 9.1 | 9.1 | | |

[1]RT=rainbow trout, SU=sucker species, CP=common carp, JK=jackrabbit species, GS=ground squirrel species, GW=gadwall.

Table 66. Bald eagle habitat analysis at the Sycamore BA, Arizona, 2012.

| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type[5] | Land Type[6] |
|---|---|---|---|---|---|---|
| 7.6 | CL | Left | Yes | 1 | RU / PN* | TX |
| 9.5 | SM | Left | No | 1 | RI | MB |
| 10.1a | ST | Left | No | 4 | RU | MB |
| 10.1b | SP | Left | No | 8 | RU | MB |
| 10.3 | MS | Left | Yes | 1 | RU | MB |
| 10.4a | SG | Left | No | 6 | RI | MB |
| 10.4b | SM | Left | No | 6 | RI | MB |
| 11.4 | CM | Right | Partial | 2 | RU | CW |
| 11.7 | ST | Right | No | 1 | RU | CW |
| 11.8 | SP | Right | No | 3 | RU | MB |
| 0.4 S | MS | Left | No | 8 | – | MB |
| 1.0 S | YL | Right | Yes | 8 | – | MB |

[1]River kilometer (Hunt et. al. 1992). V=Verde River, S=Sycamore Creek.
[2]CL=cottonwood large/20-30+ m, CM=cottonwood medium/10-20m, MS = Mesquite, SG=soft snag (dead but branches still intact), SM=snag, mesquite, SP=stump or fallen tree, ST=snag top, YL=sycamore large/10-20+m.
[3]Side of river facing downstream.
[4]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[5]PN=pond, RI=riffle, RU=run.
[6]CW=cottonwood grove, MB=mesquite bosque, TX=tamarisk thicket.

Table 67. Bald eagle habitat use at the Sycamore BA, Arizona, 2012.

| River km[1] | PW[2,3] | PH | CL | PP | ET | PD | PK | PV | GN | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|
| V 7.6 | 5 | 8 | – | – | – | – | – | – | – | 13 | 0.1 |
| V 9.5 | 70 | 816 | – | – | – | – | – | – | – | 886 | 4.3 |
| V 10.1 | 5 | – | – | – | 107 | – | 22 | – | – | 134 | 0.6 |
| V 10.3 | 5 | – | – | – | – | – | – | – | – | 5 | 0.1 |
| V 10.4 | 18,161 | – | 639 | 401 | 47 | 70 | 33 | 13 | – | 19,364 | 94.0 |
| V 11.4 | – | – | – | – | – | – | – | – | 4 | 4 | 0.1 |
| V 11.7 | 9 | 69 | – | – | – | – | – | – | – | 78 | 0.4 |
| V 11.8 | – | 12 | – | – | – | – | – | – | – | 12 | 0.1 |
| S 0.4 | 62 | – | – | – | – | – | – | 2 | – | 64 | 0.3 |
| S 1.0 | 46 | – | – | – | – | – | – | – | – | 46 | 0.2 |
| Total | 18,363 | 905 | 639 | 401 | 154 | 70 | 55 | 15 | 4 | 20,606 | |
| Percent | 89.1 | 4.4 | 3.1 | 2.0 | 0.7 | 0.3 | 0.3 | 0.1 | 0.1 | | |

[1]River kilometer (Hunt et. al. 1992). V=Verde River, S=Sycamore Creek.
[2]Observation time (minutes).
[3]PW = Perched watching, PH = Perched hunting, CL = Perched close to mate, PP = perched preening, ET = Eating in tree, PD = Perched drying, PK = Perched with prey, PV = Perched vocalizing, GN = Gathering nest material.

## APPENDIX O: TONTO BREEDING AREA SUMMARY

Table 68. Observed human activity and bald eagle behavior, Tonto BA, Arizona, 2012.

| Human Activity | N[1] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Birder | 50 | – | – | – | – | – | – | 50 | 42.1 |
| Hiker | 18 | – | 1 | 1 | – | – | – | 20 | 17.2 |
| Cattle | 16 | – | – | – | – | – | – | 16 | 13.6 |
| Small plane | 4 | 8 | – | – | – | – | – | 12 | 10.2 |
| Dog | 2 | 6 | – | – | – | – | – | 8 | 6.8 |
| Helicopter | 1 | 3 | – | – | – | – | – | 4 | 3.4 |
| Rancher | – | 2 | – | – | – | – | – | 2 | 1.7 |
| Photographer | 2 | – | – | – | – | – | – | 2 | 1.7 |
| Fishermen | 2 | – | – | – | – | – | – | 2 | 1.7 |
| Researcher | 1 | – | – | – | – | – | – | 1 | 0.8 |
| OHV | 1 | – | – | – | – | – | – | 1 | 0.8 |
| Total | 97 | 19 | 1 | 1 | – | – | – | 118 | |

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

Table 69. Observed forage events and success, Tonto BA, Arizona, 2012.

| Sex | Fish | | Birds | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U | E | S-U | E | S-U |
| Male | 9 | 8-1 | 4 | 2-2 | 1 | 0-1 | 14 | 10-4 |
| Female | 6 | 6-0 | – | – | – | – | 6 | 6-0 |
| Total | 15 | 14-1 | 4 | 2-2 | 1 | 0-1 | 20 | 16-4 |

[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, Tonto BA, Arizona, 2012.

| Sex | Fish | Mammals | Unknown | Total | Percent |
|---|---|---|---|---|---|
| Male | 47 | 2 | 1 | 50 | 73.5 |
| Female | 18 | – | – | 18 | 26.5 |
| Total | 65 | 2 | 1 | 68 | |
| Percent | 95.6 | 2.9 | 1.5 | | |

Table 71. Observed prey species delivered to the nest, Tonto BA, Arizona 2012.

| Sex | Fish | | | | | | Total | Percent |
|---|---|---|---|---|---|---|---|---|
| | CC[1] | BC | LB | CP | SB | FC | | |
| Male | 11 | 7 | 5 | 2 | 2 | – | 27 | 71.1 |
| Female | 3 | 2 | 1 | 2 | 1 | 2 | 11 | 28.9 |
| Total | 14 | 9 | 6 | 4 | 3 | 2 | 38 | |
| Percent | 36.8 | 23.7 | 15.8 | 10.5 | 7.9 | 5.3 | | |

[1]CC=channel catfish, BC=black crappie, LB=largemouth bass, CP=common carp, SB=smallmouth bass, FC=flathead catfish.

Table 72. Bald eagle habitat analysis at the Tonto BA, Arizona, 2012.

| Perch Location[1] | Perch Type[2] | Side[3] | Shade | Distance to $H_2O$[4] | $H_2O$ Type[5] | Land Type[6] |
|---|---|---|---|---|---|---|
| 13.0 | HS | Right | No | 1 | RS | UP |
| 15.0 | SG | Right | No | 1 | IF | UP |
| 15.6 | SG | Left | No | 1 | IF | UP |
| 15.7 | SS | Right | No | 1 | IF | UP |
| 15.8 | HS | Right | No | 1 | RU | UP |
| 16.1 | SS | Left | No | 1 | RI | UP |
| 16.2 | HS | Right | No | 1 | RI | UP |
| 16.3a | SS | Right | No | 1 | PO | UP |
| 16.3b | BA | Left | Yes | 3 | PO | UP |
| 16.7 | SO | Left | No | 1 | PO | UP |
| 16.9a | HS | Right | No | 2 | RI | UP |
| 16.9b | HS | Left | No | 1 | RI | UP |
| 16.9c | SM | Left | Partial | 3 | RI | MB |
| 16.9d | HS | Left | No | 1 | RI | UP |
| 16.9e | CS | Left | Yes | 1 | RI | UP |
| 16.9f | SG | Right | No | 2 | RI | UP |
| 17.3 | HS | Left | No | 1 | RU | MB |

[1]River kilometer (Hunt et. al. 1992).
[2]BA=cut bank, CS=cottonwood, small (0-10m), HS=hard snag (main branches only), SG= soft snag (dead but small branches still intact), SM=snag, mesquite, SO=shore, SS=snag, shrub.
[3]Side of river facing downstream.
[4]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[5]IF=inflow to reservoir, PO=pool, RI=riffle, RU=run, RS=reservoir main body.
[6]MB=mesquite bosque, UP=upland desert.

Table 73. Bald eagle habitat use at the Tonto BA, Arizona, 2012.

| River km[1] | PW[2,3] | SS | DW | PD | PH | PP | ES | PR | OT | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15.6 | 22 | – | – | – | 88 | – | – | – | – | 110 | 0.7 |
| 15.7 | 52 | – | 3 | – | – | – | – | – | – | 55 | 0.3 |
| 15.8 | 61 | – | – | – | 3 | – | – | – | – | 64 | 0.4 |
| 16.2 | 281 | – | – | – | 10 | – | – | – | – | 291 | 1.8 |
| 16.3 | 1,097 | – | – | – | 20 | – | – | – | – | 1,117 | 7.1 |
| 16.7 | 741 | 529 | 279 | 49 | 12 | 4 | 82 | – | 2 | 1,698 | 10.7 |
| 16.8 | 5 | – | – | – | – | – | – | – | – | 5 | 0.1 |
| 16.9 | 11,572 | – | – | 222 | – | 104 | – | 80 | 95 | 12,073 | 76.3 |
| 17.3 | 416 | – | – | – | – | – | – | – | – | 416 | 2.6 |
| Total | 14,247 | 529 | 282 | 271 | 133 | 108 | 82 | 80 | 97 | 15,829 | |
| Percent | 90.0 | 3.3 | 1.8 | 1.7 | 0.8 | 0.7 | 0.5 | 0.5 | 0.6 | | |

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, SS=standing on shore, DW=drinking water, PD=perched drying, PH=perched hunting, PP=perched preening, ES=eating on shore, PR=perched roosting, OT=other (includes eating in nest tree, eating in nest, and perched vocalizing).

## APPENDIX P: WOODS CANYON BREEDING AREA SUMMARY

Table 74. Observed human activity and bald eagle behavior, Woods Canyon BA, Arizona, 2012.

| Human Activity[1] | N[2] | W | R | F | L | B | U | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Hiker | 12 | 1 | – | 2 | – | – | – | 15 | 37.5 |
| Fisherman | 14 | – | – | – | – | – | – | 14 | 35.0 |
| Boat | 6 | – | – | 1 | – | – | – | 7 | 17.5 |
| Kayak | 1 | – | – | – | – | – | – | 1 | 2.5 |
| Fishing tuber | 1 | – | – | – | – | – | – | 1 | 2.5 |
| Photographer | – | 1 | – | – | – | – | – | 1 | 2.5 |
| Birdwatcher | 1 | – | – | – | – | – | – | 1 | 2.5 |
| Total | 35 | 2 | – | 3 | – | – | – | 40 | |

[1]Includes only activities within 25m of an adult or fledgling, outside of the closure area. Activities >25m from an eagle were not seen to cause a significant reaction.
[2]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=birds not in area, U=unknown.

Table 75. Observed forage events and success, Woods Canyon BA, Arizona, 2012.

| Sex | Fish | | Total | |
|---|---|---|---|---|
| | E[1] | S-U[2] | E | S-U |
| Male | 28 | 14-14 | 28 | 14-14 |
| Female | 22 | 17-5 | 22 | 17-5 |
| Unknown | 2 | 1-1 | 2 | 1-1 |
| Total | 52 | 32-20 | 52 | 32-20 |

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

Table 76. Observed prey types delivered to the nest, Woods Canyon BA, Arizona, 2012.

| Sex | Fish | Total | Percent |
|---|---|---|---|
| Male | 46 | 46 | 54.1 |
| Female | 39 | 39 | 45.9 |
| Total | 85 | 85 | |
| Percent | 100 | | |

Table 77. Bald eagle habitat analysis at the Woods Canyon BA, Arizona, 2012 (continued next page).

| Perch Location[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 0.3a | SG | – | Partial | 1 | RS | CF |
| 0.3b | PS | – | No | 1 | RS | CF |
| 0.3c | LG | – | No | 1 | RS | CF |
| 0.3d | BO | – | No | 1 | RS | CF |
| 0.4 | SG | – | Partial | 1 | RS | CF |
| 0.9a | PS | – | Partial | 1 | RS | CF |
| 0.9b | ST | – | No | 1 | RS | CF |
| 1.0 | PS | – | Yes | 1 | RS | CF |
| 1.1a | PS | – | Yes | 1 | RS | CF |
| 1.1b | HS | – | No | 1 | RS | CF |
| 1.1c | ST | – | No | 1 | RS | CF |
| 1.3a | PS | – | Partial | 1 | RS | CF |
| 1.3b | SG | – | No | 1 | RS | CF |
| 1.4a | SG | – | No | 1 | RS | CF |
| 1.4b | PS | – | Yes | 1 | RS | CF |
| 1.5 | SG | – | Partial | 1 | RC | CF |
| 1.7 | PS | – | Partial | 1 | RC | CF |
| 1.8a | HS | – | No | 6 | RC | CF |
| 1.8b | PS | – | Yes | 1 | RS | CF |
| 1.9 | HS | – | No | 1 | RS | CF |
| 2.2a | HS | – | No | 1 | RS | CF |
| 2.2b | ST | – | No | 1 | RS | CF |
| 2.2c | PS | – | Partial | 1 | RS | CF |
| 2.3 | HS | – | No | 1 | RS | CF |
| 2.4a | ST | – | No | 1 | RC | CF |
| 2.4b | PS | – | Partial | 1 | RC | CF |
| 2.4c | LG | – | No | 1 | RC | CF |
| 2.5 | PS | – | Partial | 1 | RC | CF |
| 2.6a | PS | – | Partial | 1 | RC | CF |
| 2.6b | SG | – | No | 1 | RC | CF |
| 2.7a | SO | – | Yes | 1 | RC | CF |
| 2.7b | HS | – | Yes | 1 | RC | CF |
| 3.0 | LG | – | No | 1 | RC | CF |
| 3.2a | SG | – | No | 1 | RC | CF |
| 3.2b | SG | – | No | 1 | RC | CF |
| 3.4a | PS | – | Partial | 1 | RC | CF |
| 3.4b | SG | – | No | 1 | RC | CF |
| 3.4c | ST | – | No | 1 | RC | CF |
| 3.4d | HS | – | No | 1 | RS | CF |
| 3.5a | SO | – | No | 1 | RS | CF |
| 3.5b | HS | – | No | 4 | RS | CF |

[1]Lake kilometer (counterclockwise from middle of dam).
[2]BO=boulder, HS=hard snag (main branches only), LG=log, PS=pine/conifer, 2nd growth/10-20+ m, SG=soft snag (dead but branches still intact), SO=shore, 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]RS=reservoir main body, RC=reservoir cove.
[5]CF=conifer forest.

Table 77 continued.

| Perch Location[1] | Perch Type[2] | Side | Shade | Distance to $H_2O$[3] | $H_2O$ Type[4] | Land Type[5] |
|---|---|---|---|---|---|---|
| 3.5c | HS | – | No | 2 | RS | CF |
| 3.5d | PS | – | No | 3 | RS | CF |
| 3.5e | ST | – | No | 3 | RS | CF |
| 3.5f | HS | – | No | 5 | RS | CF |
| 3.6a | HS | – | No | 3 | RS | CF |
| 3.6b | SG | – | No | 1 | RS | CF |
| 3.6c | PS | – | Partial | 1 | RS | CF |
| 3.7a | SG | – | No | 1 | RS | CF |
| 3.7b | HS | – | No | 1 | RS | CF |
| 3.7c | HS | – | No | 3 | RS | CF |
| 3.8a | HS | – | No | 1 | RS | CF |
| 3.8b | SG | – | Partial | 1 | RS | CF |
| 3.9a | SG | – | Partial | 1 | RS | CF |
| 3.9b | HS | – | Partial | 1 | RS | CF |
| 4.2 | PS | – | No | 1 | RS | CF |
| 4.6 | PS | – | No | 3 | RS | CF |
| 4.7a | PS | – | Partial | 1 | RS | CF |
| 4.7b | ST | – | No | 1 | RS | CF |
| 4.8a | PS | – | Partial | 1 | RS | CF |
| 4.8b | ST | – | Partial | 1 | RS | CF |
| 4.8c | SG | – | Partial | 1 | RS | CF |
| 4.9 | PS | – | Yes | 1 | RS | CF |
| 5.0a | PS | – | Yes | 1 | RS | CF |
| 5.0b | HS | – | No | 1 | RS | CF |
| 5.0c | ST | – | No | 1 | RS | CF |

[1]Lake kilometer (counterclockwise from middle of dam).
[2]BO=boulder, HS=hard snag (main branches only), LG=log, PS=pine/conifer, 2nd growth/10-20+ m, SG=soft snag (dead but branches still intact), SO=shore, 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]RS=reservoir main body, RC=reservoir cove.
[5]CF=conifer forest.

| Table 78. Bald eagle habitat use at the Woods Canyon BA, Arizona, 2012. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lake km[1] | PW[2,3] | PH | CL | PP | ET | PV | DW | GN | SS | Total | Percent |
| 0.3 | 6 | 9 | – | – | 5 | – | 1 | – | – | 21 | 0.6 |
| 0.4 | 27 | – | – | – | – | – | – | – | – | 27 | 0.7 |
| 0.8 | 28 | – | – | 5 | – | – | – | – | – | 33 | 0.9 |
| 0.9 | 22 | 99 | – | – | – | – | – | – | – | 121 | 3.2 |
| 1.0 | 6 | 8 | – | – | – | – | – | – | – | 14 | 0.4 |
| 1.1 | 464 | 44 | – | – | – | – | – | – | – | 508 | 13.3 |
| 1.2 | – | 1 | – | – | – | – | – | – | – | 1 | 0.1 |
| 1.3 | 94 | – | – | – | – | – | – | – | – | 104 | 2.7 |
| 1.4 | 10 | – | – | – | 5 | – | – | – | – | 15 | 0.4 |
| 1.5 | – | – | – | – | 7 | – | – | – | – | 7 | 0.2 |
| 1.7 | 135 | 7 | – | – | – | – | – | – | – | 142 | 3.7 |
| 1.8 | 158 | 58 | – | – | – | – | – | – | – | 216 | 5.7 |
| 1.9 | 90 | – | – | – | – | – | – | – | – | 90 | 2.4 |
| 2.2 | 12 | – | – | 2 | – | – | – | – | – | 14 | 0.4 |
| 2.3 | 46 | – | – | – | – | – | – | – | – | 46 | 1.2 |
| 2.4 | 13 | 18 | – | 35 | 8 | – | 8 | – | – | 82 | 2.2 |
| 2.5 | – | 12 | – | – | – | – | – | – | – | 12 | 0.3 |
| 2.6 | 57 | – | – | – | – | – | – | – | – | 57 | 1.5 |
| 2.7 | 36 | – | – | – | – | – | – | – | 5 | 41 | 1.1 |
| 3.0 | 15 | – | – | – | – | – | – | – | – | 15 | 0.4 |
| 3.2 | 49 | – | – | – | – | – | – | – | – | 49 | 1.3 |
| 3.4 | 71 | – | – | – | – | – | – | – | – | 71 | 1.9 |
| 3.5 | 202 | – | – | – | – | 6 | – | – | – | 208 | 5.5 |
| 3.6 | 184 | 3 | – | – | – | – | – | – | – | 187 | 4.9 |
| 3.7 | 59 | – | 7 | 5 | 8 | – | – | – | – | 79 | 2.1 |
| 3.8 | 181 | 4 | – | – | – | 7 | – | – | – | 192 | 5.0 |
| 3.9 | 62 | – | – | – | – | – | – | – | – | 62 | 1.6 |
| 4.2 | 10 | – | – | – | – | – | – | – | – | 10 | 0.3 |
| 4.6 | 2 | 17 | – | – | – | – | – | 6 | – | 25 | 0.7 |
| 4.7 | – | 144 | 102 | – | – | – | – | – | – | 246 | 6.5 |
| 4.8 | 285 | 110 | – | – | – | – | – | – | – | 395 | 10.4 |
| 4.9 | 133 | 28 | – | – | – | – | – | – | – | 161 | 4.2 |
| 5.0 | 477 | 88 | – | – | – | – | – | – | – | 565 | 14.8 |
| Total | 2,934 | 650 | 109 | 47 | 43 | 13 | 9 | 6 | 5 | 3,806 | |
| Percent | 76.9 | 17 | 2.9 | 1.2 | 1.1 | 0.4 | 0.2 | 0.2 | 0.1 | | |

[1]Lake kilometer (counterclockwise from middle of dam).
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, CL=perched very close to mate, PP=perched preening, PV=perched vocalizing, ET=eating in tree, DW=drinking Water, GN=gathering nest material, SS=standing on shore.