ARIZONA BALD EAGLE MANAGEMENT PROGRAM
2007 SUMMARY REPORT

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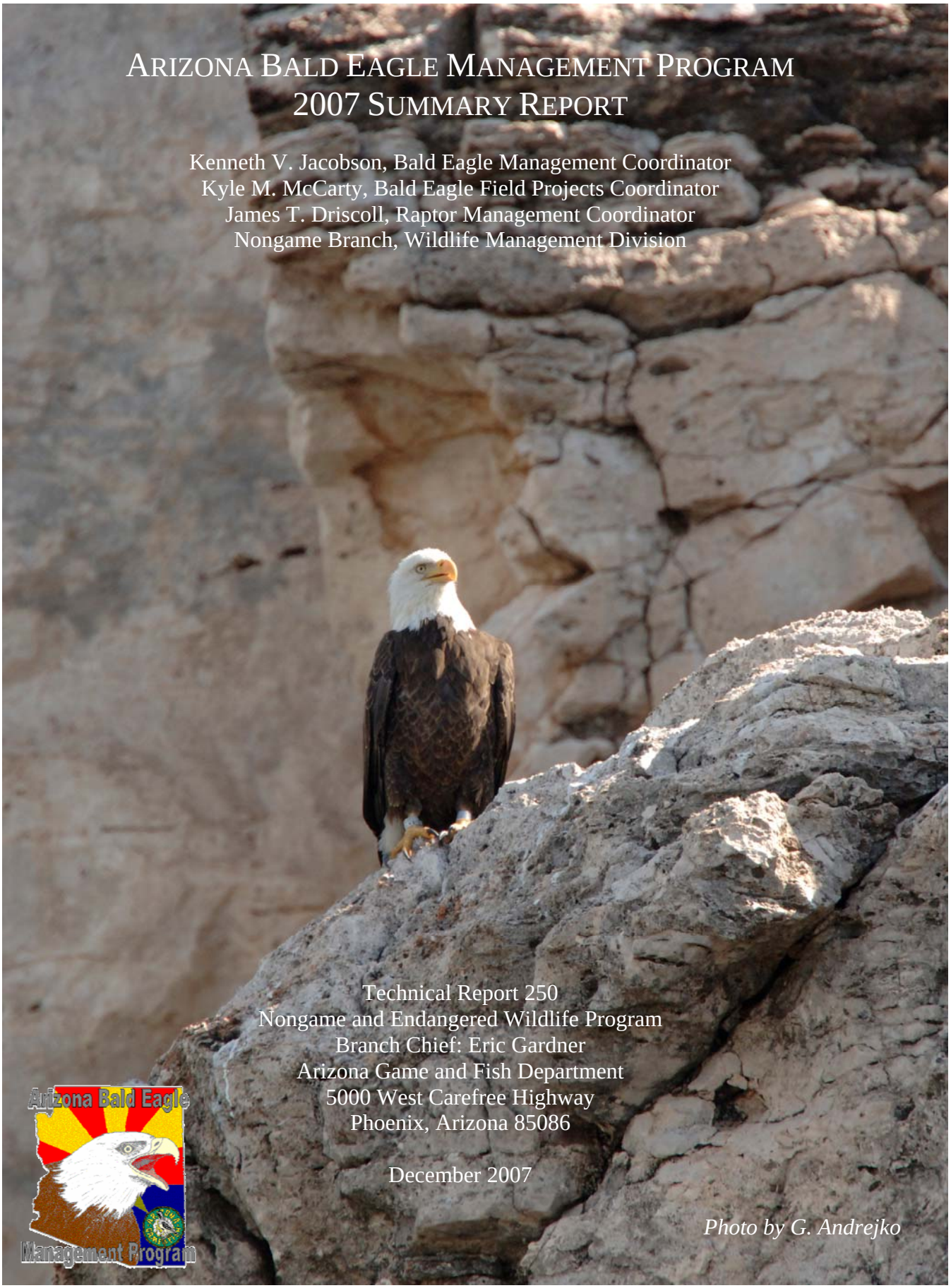

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This report, in part, summarizes the results of monitoring by the Arizona Bald Eagle Nestwatch Program using the breeding area reports submitted in 2007. Those include: Thomas Magarian and Jean Carpenter, Box Bar BA; Nicholle Stephens and Patrick Rainbolt, Canyon de Chelly BA; Joe Peddie and Marta Peddie, Luna and Crescent BAs; Vivian Bui and Geni Gellhaus, Needle Rock BA; Wyatt Nimitz and Ingrid Verhoeckx, Orme/Granite Reef BA; Morgan Jackson and John Yerger, Pinto and Ladders BA; David Janssen and John Clare, Lake Pleasant BA; Brad Donaldson and Cindy Donaldson, San Carlos BA; Anna Young and Joan Wike, Tonto BA; Audrey Clark and Santiago Galvis, Tower BA.

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ARIZONA BALD EAGLE MANAGEMENT PROGRAM 2007 SUMMARY REPORT

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INTRODUCTION

In 1978, the U.S. Fish and Wildlife Service (USFWS) listed the bald eagle (*Haliaeetus leucocephalus*) as endangered under the Endangered Species Act 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). The bald eagle remains protected under the Airborne Hunting Act, Bald and Golden Eagle Protection Act, Lacey Act, Migratory Bird Treaty Act, the Convention on International Trade in Endangered Species of Wild Flora and Fauna, and Arizona Revised Statute Title 17.

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, Army Corps of Engineers, Fort McDowell Yavapai Nation, Geo-Marine (U.S. Air Combat Command), The Hopi Tribe, Maricopa County Parks and Recreation Department (MCPRD), Navajo Nation Fish and Wildlife, Phelps Dodge, Salt River Pima-Maricopa Indian Community (SRPMIC), Salt River Project (SRP), San Carlos Apache Tribe (SCAT), Tonto Apache Tribe, 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 details the history of bald eagle management in the state and outlines the foundation for future management (Driscoll et al. 2006). The CAS describes current threats facing bald eagles in Arizona and identifies management actions necessary to maintain their distribution and abundance in the state following delisting.

Prior to 2004, the Arizona Bald Eagle Management Program annually provided 3 separate technical reports summarizing the Arizona Bald Eagle Winter Count, Arizona Bald Eagle Survey, and the Arizona Bald Eagle Nestwatch Program (ABENWP). Since 2004, we have compiled all of this information into 1 report, the Arizona Bald Eagle Management Program.

STUDY AREA

Statewide monitoring and surveys were conducted primarily within 5 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, and Interior Chaparral. Other biotic communities visited included Chihuahuan Desertscrub, Mohave Desertscrub, Great Basin Desertscrub, Semidesert Grassland, Subalpine Grassland, Sonoran Riparian Deciduous Forest and Woodlands, 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 (*Cercidium floridium*), mesquite (*Prosopis* spp.), ironwood (*Olneya tesota*), saguaro (*Carnegiea gigantea*), teddy bear cholla (*Opuntia bigelovii*), juniper (*Juniperus* spp.), and pinyon pine (*Pinus edulis*). Eight BAs are located outside of Sonoran Riparian Scrubland areas (Brown 1994). The Becker BA is within the Plains and Great Basin Grassland biome where the nest is in an isolated patch of Fremont cottonwoods. Canyon De Chelly, Crescent, Dupont, Lower Lake Mary, Luna, Lynx, and Rock Creek 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). Dupont and Rock Creek are located in patches of Rocky Mountain and 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 surrounded by Great Basin Desertscrub, consisting mainly of sagebrush (*Artemisia tridentata*), blackbrush (*Coleogyne ramosissima*), and shadscale (*Atriplex confertifolia*).

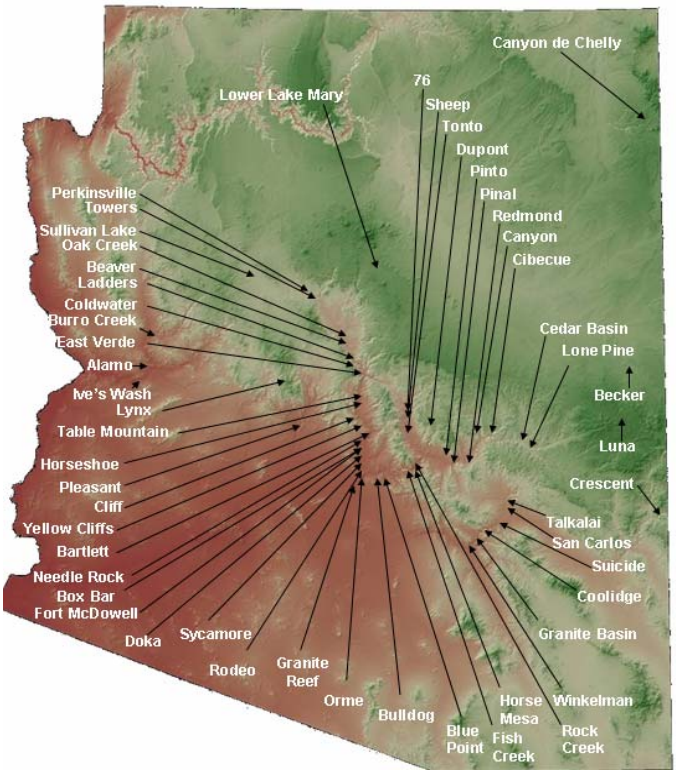


Figure 1. Location of known bald eagle BAs in Arizona, 2007.

With the exception of the Dupont and Rock Creek BAs, bald eagles in Arizona nest within a mile of water. BAs are located along: Burro, Canyon, Cibecue, Oak, Pinal, Tangle, Tonto, and Walnut creeks; Alamo, Apache, Bartlett, Crescent, Horseshoe, Lower Lake Mary, Luna, Lynx, Pleasant, Roosevelt, Saguaro, San Carlos, and Talkalai lakes or reservoirs; and the Agua Fria, Bill Williams, Little Colorado, Gila, Salt, San Carlos, San Francisco, San Pedro, 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, sycamore, willows, snags, and 1 artificial structure (Horseshoe BA 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 in 2007 (USFWS 1999, 2006, 2007), the importance of the national winter count will persist. Through each state's consistent efforts, the winter count will continue to provide post-delisting data on national population trends. In addition, the count attracts volunteers and generates public interest in bald eagle conservation (Steenhof et al. 2002, 2004).

The National Wildlife Federation (NWF) initiated and organized the national bald eagle winter count from 1979-1991. The U.S. Geological Survey Biological Division, Snake River Field Station (USGS), now coordinates the national winter count effort. Arizona participated in the program from the 1970's to the early 1980's (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. Jacobson et al. 2006). 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 were not productive and to include 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.

METHODS

We continued to use, and strived to complete, the established 104 standardized survey routes for the 2007 Arizona bald eagle count. Additional routes were completed and integrated into this document for management purposes, but were not included in the results submitted to the USGS. We scheduled the winter count January 5-11, 2007, which included weekdays for agency personnel and a weekend for volunteers. The short survey period minimizes 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 a linear drainage is 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 30.5-61 m (100-200 ft) above ground level and 55-65 knots (48- 7 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 the USGS, and instructed participants on the National Survey Protocol.

We classified the bald eagle sightings into adult and subadult age classes. In addition, we include 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 (*Aguila 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 (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 2007 Arizona bald eagle winter count tallied 281 bald eagles (Table 1). We documented 192 adults (68.3%), 81 subadults (28.8%), and 8 unknown eagles (2.8%) (Table 2). The highest total number of bald eagles occurred in Coconino County (n=84), many of which were on the route from Lower Lake Mary to Mormon Lake (n=29)(Appendix A). A large number of bald eagles occurred along the lower Black River as well (n=36). An additional 14 bald eagles were counted on non-standardized routes.

Of the 104 standardized routes, Arizona surveyed 100 (96%)(Table 2). Survey effort was the most ever recorded, with a total of 11,632 minutes (193.9 hours). Coconino County has the most number of routes and therefore had the most effort with 4,575 minutes (76.2 hours).

Of the 4 routes that were not completed, 2 were ground-based routes (Point of Pines Lake area; Wet Beaver Creek), and 2 were helicopter routes. The helicopter routes were not surveyed because a storm system with low thick clouds impeded flying conditions (West Clear Creek and Del Rio Ponds). In addition, the Verde River was only partially surveyed from the Verde and East Verde Rivers confluence to the headwaters due to this same weather system. Two additional ground routes were only partially surveyed.

Other than the problems mentioned above, weather did not seem to pose many accessibility challenges during the 2007 winter count. Surveyors are asked each year to rate the weather during the count compared to previous years as being either very mild, mild, normal, harsh, or very harsh. Most responded that this year's weather was "normal" (63% of responses, n=56) or "mild" (25%, n=28), and a few responded "harsh" (8%, n=7) or "very mild" (1%, n=1). There were no responses of "very harsh" weather. Similarly, ice cover was rated as being "normal" (63%, n=51), "more than normal" (20%, n=16), "less than normal" (16%, n=13), and "much less than normal" (1%, n=1). There were no responses for ice cover being "much more than normal".

The total of 281 bald eagles counted this year is lower than the average of 322 birds counted annually during the period of standardized counts, 1995-2006. However, the total bald eagles counted and total bald eagles per route were both lower in 1995, 2001, and 2005 than they were in 2007. Presumably some bald eagles were missed this year due to uncompleted and partially surveyed routes, however this situation typically occurs each year. The age composition of the 2007 bald eagle winter count was 68% adults, 29% subadults, and 3% unknown, which is

comparable to age structure as seen in the counts from 1981 to 1985 and 1992 to 2006, when adults averaged 65%, subadults 32%, and unknown 3% of the total count (Table 2).

Table 1. Summary of the Arizona bald eagle winter count 2007.

County	Routes surveyed	Minutes	Adult	Subadult	Unknown[1]	Total	Total/ Minute	Total/ Hour
Verde River drainage	2	110	16	6	0	22	0.200	12
Salt River drainage	10	353	56	18	0	74	0.210	13
Gila River drainage	7	188	13	1	0	14	0.074	4.5
Various helicopter	4	40	3	1	0	4	0.100	6.0
Apache	15	599	12	3	0	15	0.025	1.5
Cochise	2	310	1	0	0	1	0.003	0.2
Coconino	34	4,575	59	17	8	84	0.018	1.1
Graham	Not surveyed							
Mohave	3	2,920	7	19	0	26	0.009	0.5
Navajo	16	902	17	13	0	30	0.033	2.0
Santa Cruz	1	120	0	0	0	0	0	0
Yavapai	5	1,425	6	2	0	8	0.006	0.3
Yuma and La Paz	1	90	2	1	0	3	0.033	2.0
Totals	100	11,632	192	81	8	281	0.024	1.4

[1] Unknown age bald eagles and unidentified eagles.

Table 2. Summary of Arizona bald eagle winter counts 1981-1985, 1992-2007.

Year	Survey Time	Surveys completed	Birds/minute	Adults	Subadults	Unknown[5]	Total
1981	--[1]	n/a	--	103 (63%)	60 (36%)	2 (1%)	165
1982	--	n/a	--	135 (64%)	72 (34%)	3 (2%)	210
1983	--	n/a	--	104 (66%)	53 (33%)	1 (1%)	158
1984	--	n/a	--	159 (71%)	63 (28%)	3 (1%)	225
1985	--	n/a	--	78 (66%)	40 (34%)	--	118
1992	9,801	n/a	0.0230	145 (65%)	70 (31%)	10 (4%)	225
1993	9,938	n/a	0.0187	133 (71%)	46 (25%)	7 (4%)	186
1994	7,949	n/a	0.0457	263 (72%)	96 (26%)	4 (1%)	363
1995[2]	9,563	103	0.0259	164 (66%)	76 (31%)	8 (3%)	248
1996	7,255	102	0.0498	232 (64%)	127 (35%)	2 (1%)	361
1997	7,718	96	0.0444	193 (56%)	134 (39%)	16 (5%)	343
1998	7,190[3]	93	0.0416	183 (63%)	103 (36%)	4 (1%)	290
1999	8,378[3]	105	0.0500	248 (62%)	144 (36%)	11 (3%)	403
2000	9,402[3]	110	0.0346	202 (62%)	115 (35%)	8 (2%)	325
2001	8,726[3]	108	0.0248	141 (66%)	70 (32%)	5 (2%)	216
2002	9,032	109	0.0445	236 (59%)	147 (37%)	19 (5%)	402
2003	10,036[3]	110	0.0360	232 (64%)	118 (33%)	12 (3%)	362
2004	10,587	110	0.0349	243 (66%)	113 (31%)	13 (3%)	369
2005	8,910	97	0.0695	153 (68%)	56 (25%)	15 (7%)	224
2006[4]	10,074	104	0.0315	239 (74%)	77 (24%)	7 (2%)	323
2007	11,632[3]	100	0.0242	192 (68%)	81 (29%)	8 (3%)	281
Average	9,137	104	0. 0374	180 (65%)	89 (32%)	8 (3%)	276

[1]The effort for the 1981-1984 counts was described in miles flown.
[2]Beginning of 115 standardized routes derived from the 1992-1994 surveys.
[3]Some survey times not recorded. Times averaged from reported times of previous counts.
[4]Beginning of 104 standardized routes derived from the analysis of 1995-2005 surveys.
[5]Unknown age bald eagles and unidentified eagles.

MANAGEMENT RECOMMENDATIONS

1. Maintain the current 104 standardized routes.
2. Continue to assess non-standardized routes and add new routes for areas with consistent sightings of more than 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. To assist this process, clarify survey forms to make it easier for volunteers to complete all necessary information.
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 Breeding Areas (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 (Appendix B). Timely discovery of BAs also identifies sensitive areas requiring proactive management to prevent potentially adverse impacts.

In 1972, concern about the bald eagle population's decline 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. Jacobson et al. 2006). The AGFD administered and performed the 2007 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 2006 (e.g. Jacobson et al. 2006). We also investigated reports of bald eagles and nests by other agencies, biologists, and the public. A 2 to 3 person team conducted surveys between January and June 2007. Winter count flights (January), monthly Occupancy and Reproductive Assessment (ORA) flights (February to June), and nest search flights (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 70 meters (200 ft) above ground level and at 50-60 knots (45-70 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), and nest map atlases from Hunt et al.

(1992) and SRP (2003) 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 in previous Arizona bald eagle nest survey reports (e.g. Jacobson et al. 2006).

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", "large" and "small" in this section to describe heights of cliffs, and the size of trees and nests. "Tall" and "large" refer to substrates suitable for breeding bald eagles as compared to current bald eagle nests and locations in Arizona. The terms "small" and "short" refer to structures 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 bald eagles.

RESULTS

We examined all known BAs (n=53) for breeding activity (Fig. 1). Of 48 occupied BAs, 45 pairs attempted to breed, and 25 pairs successfully produced 42 fledglings (Table 3; Appendix B, C). Significant findings of the 2007 nest survey include 3 new bald eagle BAs, 4 new alternate bald eagle nests, 4 fallen nests and 1 fallen nest tree within BAs, and 8 potential nest sites.

Table 3. Summary of Arizona bald eagle productivity 2007.

Number of BAs	53	Number of Active BAs	45
Number of Occupied BAs	48	Number of Failed Breeding Attempts	20
Number of Eggs	74	Number of Successful Breeding Attempts	25
Nest Success = 25 /48	0.52	Number of Young Hatched	61
Mean Brood Size = 42 /25	1.68	Number of Young Fledged	42
		Productivity = 0.52*1.68	0.87

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)

Burro Creek. – As a result of a report from the public, we surveyed the lower reaches of Burro Creek on February 12 and confirmed the new Burro Creek BA with the observation of an adult bald eagle incubating 2 eggs in a new cottonwood tree nest (#1). On March 29, the bald eagles were still incubating (45 days later). The nest subsequently failed, as it was well beyond the average incubation time of 35 days. It was noted on the first visit that the nest had no nest cup, no lining, and that the eggs were simply laying on sticks in the center of the nest, indicative of an inexperienced pair or first-time breeders. The adult male was unbanded, and the female had a blue Visual Identification (VID) band. However, we were unable to completely read her band number and her identity therefore was unknown.

Mogollon Rim and Anderson Mesa lakes. – The Mogollon Rim and Anderson Mesa lakes were searched for bald eagle activity on May 11. No new nests or bald eagles were found. Although breeding activity was not observed, these lakes are frequented by adult bald eagles, support

breeding ospreys, and appear to possess adequate prey resources and nesting substrate to support breeding bald eagles. We will continue to survey these areas.

Point of Pines. – On February 9, 2 adult bald eagles were located at Point of Pines Lake. Although no nests were found, the presence of adults warrants further surveys in this area.

White Horse Lake. – In April we received a report that bald eagles had been using this lake for the last 2 years. In addition, AGFD Research Branch captured an adult bald eagle (blue VID banded "0/N"; 1999 Tower nestling) and released it after fitting it with a GPS satellite transmitter. This bald eagle was regularly located at the lake, however on the May 11 helicopter survey no bald eagles were seen. Although we found no evidence of nesting we will continue to monitor this area for possible bald eagle breeding activity. We documented 3 new large nests (#1, 2, and 3). Ospreys (*Pandion haliaeetus*) were incubating in nest #1.

Historical Breeding Areas (Table 5)
Hell Point. – On March 15 we found a golden eagle incubating in nest #2.

Upper Lake Mary. – Two new large nests #3 and 4 were documented along the south side of the lake on May 11. Ospreys were incubating in nests #1 and 2.

Table 4. 2007 Arizona bald eagle nest survey summary, new locations.

Location	Date	Survey Method	Results
Ashurst Lake	5/11	Helicopter	No new nests or bald eagles.
Bear Canyon Lake	5/11	Helicopter	No new nests or bald eagles.
Beaver Creek (to McGuireville)	4/13	Helicopter	No new large nests or bald eagles.
Burro Creek	2/12, 3/15, 3/22, 3/29	Helicopter Ground	2/12- New BA with adult incubating in new tree nest #1.
Dry Lake (Point of Pines Creek)	2/9	Helicopter	No new nests. One adult and 5 subadults in area.
Gleason Flat	1/8, 2/9	Helicopter	No new nests. 1/8-One adult bald eagle in area.
Kinnikinick Lake	5/11	Helicopter	No new nests or bald eagles.
LF Ranch	1/5	Helicopter	No new nests or bald eagles.
Marshall Lake	5/11	Helicopter	No new nests or bald eagles.
Oak Creek (Verde River) to Sedona	3/15, 5/11	Helicopter	No new nests or bald eagles.
Point of Pines Lake	2/9	Helicopter	No new nests. Two adult bald eagles in area.
White Horse Lake	5/11	Helicopter	Three new large nests #1, 2, and 3. Ospreys incubating in nest #1. No bald eagles.

Table 5. 2007 Arizona bald eagle nest survey summary, historical breeding areas.

Location	Date	Survey Method	Results
Camp Verde	1/29, 3/15, 4/13	Helicopter	No new nests or bald eagles.
Hell Point	1/29, 3/15, 4/13	Helicopter	1/29-One adult bald eagle in area. 3/15-One adult golden eagle incubating nest #2. 4/13-Golden eagle nest failed.
Mule Hoof	1/9, 2/9, 3/16	Helicopter	All known nests empty. No bald eagles.
Upper Lake Mary	5/11	Helicopter	Two new large nests #3 and 4. Ospreys incubating in nests #1 and 2. No bald eagles.

Survey Sites with Existing Large Nests (Table 6)
Blue Ridge Reservoir. – No bald eagles were seen, but 3 new large nests #2, 3, and 4 were documented on May 11.

Pinto Creek. – On March 16, we surveyed Pinto Creek for bald eagles and new nests. Survey time was limited due to low helicopter fuel, and we were unable to locate nest #1. We will continue to survey this area before declaring the nest as fallen.

Sullivan Lake. – On February 20, while investigating a report of a bald eagle nest on private land in the Chino Valley we confirmed an active bald eagle nest #2 in a cottonwood tree near Del Rio Ponds. This new breeding area is within 6 km (3.69 mi) of the Sullivan Lake nest site #1, which we survey yearly. It is likely that the new pair forages on the upper Verde River, as there is very little water in the vicinity of the nest. The nest failed after incubation lasted 40 days, and on later visits no bald eagles were seen and the nest was empty. The adult male was unbanded, and the adult female was blue VID banded but was not identified.

Table 6. 2007 Arizona bald eagle nest survey summary, nest sites.

Location	Date	Survey Method	Results
Blue Ridge Reservoir	5/11	Helicopter	Three new large nests #2, 3, and 4. Ospreys incubating in nests #2 and 3. No bald eagles.
Eagle (Eagle Creek)	1/10	Helicopter	No new nests. One adult in area.
Granite (Verde River)	1/29, 3/15, 4/13	Helicopter	All known nests empty. No bald eagles.
Knoll Lake	5/11	Helicopter	Two osprey nests. No bald eagles.
Mormon Pocket (Verde River)	1/29, 4/13	Helicopter	All known nests empty. No bald eagles.
Muldoon (Verde River)	1/29, 3/15, 4/13	Helicopter	All known nests empty. No bald eagles.
Pinto Creek	3/16	Helicopter	Large nest #1 not found. No bald eagles.
RR Tunnel (Verde River)	1/29, 3/15, 4/13	Helicopter	No new nests or bald eagles.
Sullivan (Verde River)	1/29, 3/15, 4/13	Helicopter	No new nests or bald eagles.
Sullivan Lake	1/29, 2/20, 2/22, 3/15, 3/26, 4/13	Helicopter Ground	1/29- Large nest in cottonwood tree, 2 adults nearby. 3/15- New BA with adult incubating in new nest #2.
Tremaine/Soldier Annex/ Soldier/Long Lakes	5/11	Helicopter	All known nests empty. No bald eagles.
Watson Lake	3/15, 4/13	Helicopter	All known nests empty. No bald eagles.
West Clear Creek	1/29, 3/15	Helicopter	1/29- Small nest with large egg. Adult bald eagle upstream. 3/15- Nest poor, egg still present. No eagles.
Woods Canyon Lake	5/11	Helicopter	No new nests or bald eagles.
Willow (Willow Creek)	1/10	Helicopter	No new nests or bald eagles.
Willow Springs Lake	5/11	Helicopter	Osprey nest #1 active below dam. No bald eagles.

West Clear Creek. – On January 29, a small nest in a short tree was found along West Clear Creek, notable for containing a large white egg which was unattended. An adult bald eagle was seen approximately 2.6 km (1.6 mi) upstream. It seems unlikely that anything other than a bald eagle or great horned owl (*Bubo virginianus*) would have laid an egg at such an early date.

However the small size of the nest and tree leave doubt regarding occupancy by bald eagles. On March 15 the egg was still present in the nest and no bald eagles were seen. We will continue to monitor the area for further activity.

Breeding Areas (Table 7)

Cliff. – After 1994, the Cliff BA no longer showed signs of breeding activity, although adult bald eagles consistently occupied the BA through 2003. In 2004-2006 the BA was unoccupied. In 2007, USFS personnel reported a pair of adults using the area, and on March 15, a new nest #6 was confirmed in a cottonwood snag with an incubating adult. On April 13, the nest was empty and had failed for unknown reasons. The adult female of the pair was unbanded and the male had a blue VID band labeled "12/C" (2001 Box Bar nestling).

Crescent. – The bald eagles were found with 2 nestlings in a new pine snag nest #2 on May 7.

Doka. – On January 29, an adult bald eagle was seen incubating in new nest #4. On the April 13 ORA flight, the lone 7-week old nestling was seen on the ground below the nest. The nestling was rescued and taken to Liberty Wildlife to treat multiple fractures suffered in the fall and scar tissue that had sealed over the eyes, possibly in reaction to stinging insects (Figure 2). By May 11, the new nest tree snag had fallen.

Figure 2. Doka nestling at time of rescue, April 2007. Photo by K. McCarty.

Dupont. – Despite extensive searching, nest #2 was not located on 2 helicopter visits. The nest was presumed to have fallen.

Granite Basin. – The Granite Basin BA was last active in 2001 and last occupied in 2002. On March 16, an adult bald eagle was incubating in nest #1. Although the nesting attempt failed, this is the first time the pair has successfully hatched young.

Horse Mesa. – The Horse Mesa nest #2 by Horse Mesa Dam has been in existence since the 1960s, and was used by bald eagles from 1983 to 1994. Since 1995 the Horse Mesa pair has used nest #4 which is 6.9 km (4.3 mi) upstream. On February 9, both nests #2 and #4 were active. The new breeding area was named Fish Creek with nest #1 representing the same nest as the old Horse Mesa nest #2. Both nests failed during incubation, perhaps as a result of competition for resources.

Orme. – On January 29, 1 adult was incubating in nest #6 with the second adult in the area. On February 9 we observed a near adult bald eagle perched in nest tree #5 (upstream of the confluence of the Salt and Verde rivers on the Salt River), and 1 subadult was in the area of this nest on March 16. On April 20, we did not find nest #5, however, there was 1 adult and 1 subadult upstream at Blue Point cliffs. The presence of 2 near breeding age bald eagles throughout the breeding season indicates that a new pair may be preparing to occupy the area. We will continue to survey between the Orme and Bulldog BAs.

Rock Creek. – Despite extensive searching, nest #3 was not located on 2 helicopter visits. The nest was presumed to have fallen. We flew along the east side of Buckhorn Ridge/Four Peaks and along the drainages leading to Roosevelt Lake. No additional nests or eagles were observed.

San Carlos. – On the January 8 winter count we observed nest #3 had fallen and 2 adult bald eagles near a new cottonwood tree nest #4 (south of fallen nest #3), in which they later laid eggs.

Winkelman. – Despite extensive searching, nest #1 was not located on 3 helicopter visits. The nest was presumed to have fallen.

Table 7. 2007 Arizona bald eagle nest survey summary, breeding areas.

Location	Date	Survey Method	Results
Becker	4/6	Ground	All known nests empty. No bald eagles.
Canyon	1/8, 2/9	Helicopter	All known nests empty. No bald eagles.
Cedar Basin	1/9, 2/9, 3/16	Helicopter	All known nests empty. 3/16- Two adults in area downstream.
Cliff	1/5, 1/29, 3/15, 3/19, 3/23, 4/13	Helicopter Ground	3/15- Adult incubating in new tree nest #6.
Crescent	1/9, 5/31, 7/5	Helicopter Ground	5/31- Two nestlings, 3+ weeks old in new snag nest #2.
Doka	1/5, 1/29, 3/15, 4/13, 5/11	Helicopter	1/29- Adult incubating in new snag nest #4. 5/11- Nest #4 fallen (entire tree).
Dupont	2/9, 3/16	Helicopter	All known nests empty. No bald eagles. 2/9- Nest #2 fallen.
Horse Mesa	2/9, 3/16, 4/20	Helicopter	2/9- New Fish Creek BA with adult incubating in pinnacle nest #1 (was Horse Mesa nest #2). Second pair incubating in nest #4 (Horse Mesa BA).
Granite Basin	1/8, 2/9, 3/16, 4/20, 5/21	Helicopter	3/16- Adult bald eagle incubating in nest #1. 4/20- 1 3-week old nestling. 5/21- Nesting attempt failed.
Granite Reef	1/8, 3/15, 4/13, 5/11, 5/21	Helicopter	1/8- One adult in nest #2, second adult in area. 1/29- One adult incubating in nest #2.
Lower Lake Mary	3/29, 5/11	Helicopter Ground	All known nests empty, #2 in good condition. No bald eagles.
Orme	1/5, 1/29, 2/9, 3/15, 3/16, 4/13, 4/20, 5/11, 5/21	Helicopter	1/29- One adult incubating in nest #6, second adult in area. 2/9- One near adult perched in nest #5. 3/16- One subadult in area of nest #5. 4/20- Nest #5 not found. One adult and 1 subadult in area.
Rock Creek	2/9, 3/16	Helicopter	All known nests empty. No bald eagles. 2/9- Nest #3 gone.
San Carlos	1/8, 2/5, 2/9, 3/16, 4/20	Helicopter Ground	1/8- Nest #3 fallen. 2/9- Adult incubating in new tree nest #4.
Winkelman	1/8, 2/9, 3/16	Helicopter	1/8-Nest #1 gone. No bald eagles.

Overview

Significant findings of the 2007 nest survey include: 3 new bald eagle BAs, 4 new alternate bald eagle nests, 4 fallen nests and 1 fallen nest tree within BAs, and 8 new potential nest sites.

The discovery of 3 new bald eagle BAs (1 on the Salt River, 1 on Burro Creek, and 1 near the headwaters of the Verde River), along with the occupancy of the Cliff and Granite Basin BAs, contributed to several records for Arizona bald eagles, including: 1) the most number of BAs, 2) most occupied and active BAs, and 3) most eggs laid (Table 3). We also documented the most number of failed breeding attempts for a season. A key to this failure is the entire Salt River system. All but 2 of the existing Salt River BAs failed (Appendix C). The lack of productivity from the upper Salt BAs may partly be explained by long-term trends of decreases in fish abundance and diversity and increases in predatory flathead catfish (AGFD unpublished data, Driscoll et al. 2006). Continued assessment of fish populations and efforts to repatriate native fish would help to address this issue. On the lower Salt River, BAs could be experiencing increased competition for resources (i.e., decreased habitat quality) due to the compression of the BAs (e.g., Horse Mesa/Fish Creek, and Blue Point/Bulldog). In addition, golden algae fish kills may be further reducing prey abundance. Despite these reproductive losses, we documented the most number of young hatched and equaled the 2004 and 2006 season for most young fledged.

The continued creation and 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.

MANAGEMENT RECOMMENDATIONS

1. Future survey efforts should monitor historical breeding areas (BAs), potential BAs, and large nests 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. This suggests that the current distribution may extend into Sonora, 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, Occupancy and Reproductive Assessment (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. Follow-up ground surveys thoroughly investigate an area.
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 – Upper Trout Creek and Burro Creek.
   - 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, 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, Casadore Springs, Chevelon Canyon, Cholla, Christmas Tree, Doney Park, Dry, George's Basin, Knoll, Nash Creek, Phillips Park Tank, Paucity Lake, Point of Pines, Roger's, Tonto, White Horse, and Willow Springs.
- Colorado River drainage – Lake Mead (Grand Wash), Nankoweep 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 – Gun/Tonto Creek confluence, Mormon Flat Dam, Redmond BA to Canyon BA, Cibecue BA to Cedar Basin BA, Tanks Canyon.
- White Mountain Lakes – Carnero Lake, Lee's Valley Lake, Nelson Reservoir, Nutrioso, Sierra Blanca Lake.
- White River. – Whiteriver to confluence with Black and Salt rivers.

ARIZONA BALD EAGLE NESTWATCH PROGRAM

INTRODUCTION

In 1978, the USFS and 2 Maricopa Audubon Society volunteers monitored bald eagles breeding near Bartlett Reservoir to understand the effects of recreation on nesting behavior and success. This monitoring effort eventually expanded to other breeding areas (BAs), and developed into the Arizona Bald Eagle Nestwatch Program (ABENWP). In 1986, the USFWS assumed coordination of the ABENWP on behalf of the Southwestern Bald Eagle Management Committee (SWBEMC), and expanded its scope. In 1991, after passage of the Heritage Initiative, the USFWS transferred the lead to the AGFD.

To address the increasing needs of 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 to protect the bald eagles during the breeding cycle. Nestwatchers interact with members of the public who enter these closures, educate them on 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 2007. 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, Ladders, Luna, Needle

Rock, Pinto, Pleasant, San Carlos, Tonto, and Tower), those without (Canyon de Chelly, Crescent, and Orme), and those monitored for opportunistic information (Coolidge, Granite Reef, Suicide, and Talkalai). In the fall of 2006, 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 2 orientation meetings, and 3 question and answer sessions for the selected ABENWP contractors. The 2 meetings offered an introduction to the program, background information and the ABENWP's role in bald eagle management, and an explanation of data forms and emergency protocols. After the orientation meetings, the contactors 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 then after every second 10 day work period thereafter. 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 2, 2007 and continued until nestlings fledged. Teams of 2 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 8 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's) within the BA. We selected OP's to provide optimal viewing while minimizing the impact to the breeding bald eagles. Alternate OP's were identified when the breeding pair utilized areas out of the primary OP's 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 field 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. They 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 a "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 Box Bar and Needle Rock BAs, nestwatchers recorded human activity differently than described above. Due to the high level of recreation activity at the Box Bar and Needle Rock BAs within 1.0 km of the active nest, nestwatchers only recorded the human activities and the bald eagle's associated behavior that occurred on the east side of the river, which is closed. Nestwatchers at the Pleasant BA typically record compliance with the Pleasant BA closure by documenting the number of boats and jet skis approaching the buoy line and those that entered. However this year the location of the nest and OP were out of view of the buoy line and nestwatchers were unable to gather data on compliance. Low water levels at the Tonto BA prevented watercraft from approaching the nest and precluded the necessity of establishing a water closure.

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

Since 2002, nestwatchers have focused data collection on habitat use of the breeding pair. This focus will help land and wildlife managers assess impacts of projects occurring within breeding area boundaries. Due to this focus, some information collected historically has been de-emphasized. These include: inter-specific interaction, low flying aircraft reporting, prey delivered to nest, and other wildlife observed. In addition, nestwatchers are instructed to use the weekdays to document the locations and types of habitat use within the breeding pair's home range. This prohibits them from consistently monitoring the breeding pair's behavior at the nest. Therefore, comparisons to reports before 2002 may not be appropriate. Data collection on weekends remained the same with dawn to dusk monitoring of the breeding pair's behavior at the nest.

RESULTS AND DISCUSSION

The ABENWP monitored 16 breeding areas in 2007, including Box Bar, Canyon de Chelly, Coolidge, Crescent, Granite Reef, Ladders, Luna, Needle Rock, Orme, Pinto, Pleasant, San Carlos, Suicide, Talkalai, Tonto, and Tower. The final status of the monitored BAs was 2 failed, 14 successful, and 24 young fledged (Appendix C).

The Coolidge, Granite Reef, Suicide, and Talkalai BAs were monitored opportunistically by nestwatchers at adjacent BAs, therefore, data for these BAs are not included in this report.

Box Bar Breeding Area (Appendix E)

Observation Period. – February 2 to April 27. Total monitoring 65 days/380 hours.

Bald Eagle Identification. – The male was blue VID banded "5/G" on his left leg, USFWS banded on the right leg, and in adult plumage (Pleasant 1994 nestling). The female was blue VID banded "5/H" on her left leg, USFWS banded on the right leg, and in adult plumage (Pleasant 1994 nestling). The male and female are siblings.

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 the campground

at the end of USFS road 161. 4) On March 14, 2 female nestlings were blue VID banded "20/H" and "20/K" at 6 weeks of age.

Human Activity. – Nestwatchers recorded 78 human activities within the closure. Terrestrial activity of 9 types represented 51.3%, aircraft activity (helicopters, small planes, and motorized parachutes) represented 46.1%, and water pursuits (kayak/canoe, tuber) represented 2.6%. Four activities elicited 5 significant responses from the breeding pair. The bald eagles flushed from 2 motorized parachutes and 1 helicopter. They left the area once in response to 1 group of OHVs in the closure area and 1 researcher.

Figure 3. Box Bar breeding area. Maricopa County, Arizona.Photo by J. Driscoll.

Food Habits. – Nestwatchers observed 9 forage events. The male was successful in 50% (n=4), the female in 25% (n=4), and an unknown adult in 100% (n=1) of forage events. Of these attempts, fish accounted for 88.9%, and unknown prey types 11.1%. The breeding pair was observed delivering 87 prey items to the nest. The male delivered 49.4%, the female 48.3%, and an unknown adult 2.3%. The most common prey type was fish at 77.0%, although 3.5% mammals and birds each, and 16.1% unknown prey types were also seen delivered. Of the 31 prey further identified to species, 48.4% were tilapia (*Tilapia spp.*), 12.9% suckers (*Catostomus spp*.), 12.9% carp (*Cyprinus carpio*), 6.4% rock squirrel (*Spermophilus variegatus*), and 3.2% bass (*Micropterus spp.*), catfish (*Ictalurus punctatus*), common merganser (*Mergus merganser*), American coot (*Fulica americana*), common moorhen (*Gallinula chloropus*), and ground squirrel (*Spermophilus spp.*) each.

Habitat Use. – The Box Bar nestwatchers identified 19 separate perch locations that spanned a 4.0 km stretch of the Verde River ranging from rk 21.5 to 25.5. The bald eagle pair was observed spending 78.6% of their time at rk 24.9, 9.1% at rk 23.1, 5.3% at rk 25.0, and 7% at the remaining perch locations.

Canyon de Chelly Breeding Area (Appendix F)
Observation Period. – February 2 to May 6. Total monitoring 70 days/703 hours.

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

Management Activities. – 1) The National Park Service (NPS) provided nestwatchers with housing near the Monument headquarters. 2) NPS and Navajo Nation personnel oriented nestwatchers to the BA upon their arrival.

Human Activity. – Nestwatchers recorded 612 human activities during the monitoring period. Terrestrial activities of 12 types accounted for 96.6% and watercraft (boaters) 3.4%. Two

activities elicited 2 significant responses from the breeding pair. The bald eagles left the area in response to 1 driver and horseback rider each.

Food Habits. – Nestwatchers observed 59 forage events. The male was successful in 74.4% (n=43), and the female in 81.3% (n=16) of forage events. Of these attempts, fish accounted for 84.7%, birds 3.4%, mammals 1.7%, and unknown prey 10.2%. The breeding pair was observed delivering 113 prey items to the nest, of which the male delivered 78.8% and the female 21.2%. The most common prey type was fish representing 82.3%, although 4.4% birds, 0.9% mammals, and 12.4% unknown prey types were also seen delivered. Of the 81 prey deliveries further identified, 64.2% were trout (*Oncorhynchus spp.*), 16.0% channel catfish, 9.9% goldfish (*Carassius auratus*), 3.7% bluegill (*Lepomis macrochirus*), 3.7% waterfowl species, and 1.2% ruddy duck (*Oxyura jamaicensis*) and common raven (*Corvus corax*) each.

Habitat Use. – The Canyon de Chelly nestwatchers identified 21 separate perch locations around the lake. The pair was observed spending 81.2% of their time between lk 2.8 and 3.2, 12.7% between lk 5.3 and 5.5, 3.1% at lk 3.8, and 3% at the remaining perch locations.

Crescent Breeding Area (Appendix G)
Observation Period. – May 25 to August 1. Total monitoring 56 days/484 hours.

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

Bald Eagle Identification. – The male was blue VID banded "8/R" on his left leg, USFWS band on the right leg, and was in adult plumage (Luna 1997 nestling). The female was unbanded and in adult plumage (unknown origin).

Management Activities. – 1) The USFS posted "No Entry" signs surrounding the nest area knoll. 2) The USFS posted "No Stopping" signs along the west boat ramp access road.

Human Activity. – Nestwatchers recorded 1,331 human activities during the monitoring period. Terrestrial activity of 13 different types represented 79.6%, watercraft (boaters, float tubers, and canoes) 20.0%, and aircraft (small planes and helicopters) 0.4%. Ten activities elicited 22 significant responses from the breeding pair. The bald eagles were restless in response to 6 ranchers with cattle, 3 agency workers, 2 small planes and birders each, and 1 driver, OHV, helicopter, bicycler, and dog each. The pair flushed in response to 2 agency workers and 1 horseback rider and helicopter each.

Food Habits. – The nestwatchers observed 146 forage attempts. The male was successful in 83.1% (n=83) and the female in 92.1% (n=63). Of these forage attempts, 99.3% were for fish and 0.7% birds. The breeding pair was observed delivering 127 prey items to the nest. The male delivered 54.3% and the female 45.7%. Fish comprised 99.2% of those items and mammals 0.8%. No prey items were identified to species.

Habitat Use. – The Crescent nestwatchers identified 11 perch locations around the nest knoll totaling 29,421 minutes of observation. Due to the small area and uniqueness of this breeding area, specifics on habitat use are provided within this year's Nestwatch Reports.

Ladders Breeding Area (Appendix H)
Observation Period. – February 23 to April 9. Total monitoring 32 days/247 hours.

ABENWP contractors were assigned to the Ladders BA after the Pinto BA failed. Therefore, observation dates and times vary.

Bald Eagle Identification – The male was blue VID banded "9/W"on his left leg, USFWS banded on the right leg, and was in adult plumage (1998 76 nestling). The female was unbanded and in adult plumage (unknown origin).

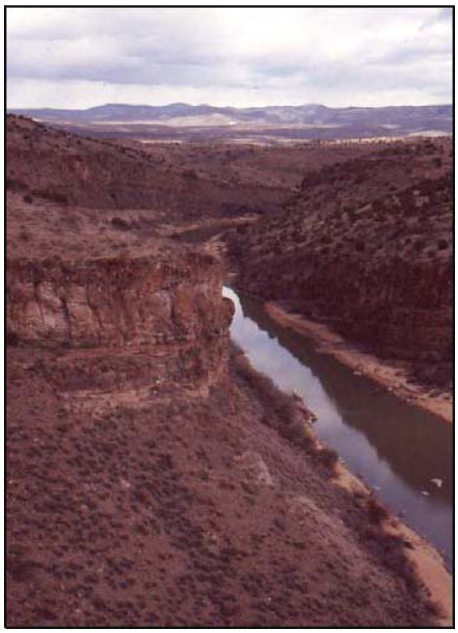


Figure 5. Ladders breeding area. Yavapai County, Arizona. Photo by J. Driscoll.

Management Activities – 1) The USFS enacted a seasonal breeding area closure surrounding the nest area. 2) The USFS posted closure signs at the upstream and downstream access points to the Verde River. 3) Two male nestlings were VID banded "20/K" and "20/M" at 5.5 weeks of age.

Human Activity. – Nestwatchers recorded 68 human activities. Watercraft (canoes/kayaks) accounted for 55.9%, aircraft (small planes and helicopters) 39.7%, and terrestrial activities (agency workers and ranchers) 4.4%. Four activities elicited 7 significant responses from the breeding pair. The bald eagles were restless in response to 2 canoes/kayaks and 1 small plane and agency worker each. The bald eagles flushed in response to 2 canoe/kayaks and 1 helicopter.

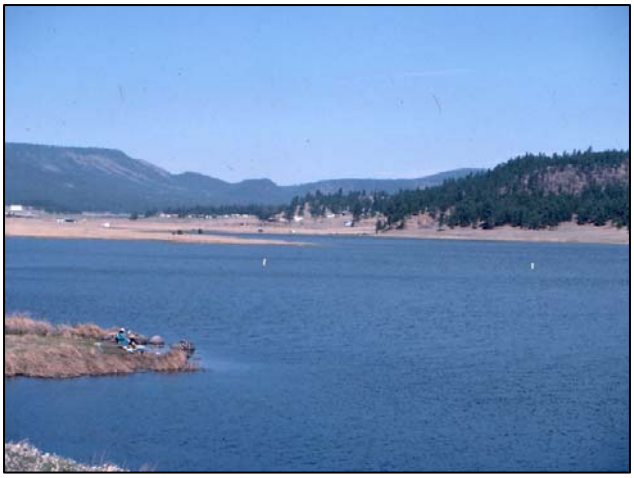
Food Habits. – The nestwatchers observed 5 forage attempts. The male was successful in 75% (n=4) and the female unsuccessful in her 1 attempt. Of these forage attempts, 40.0% were mammals, and 20.0% were fish, carrion, and unknown prey each. The breeding pair were observed delivering 25 prey items to the nest. The male delivered 84.0% and the female 16.0%. Fish comprised 40% of those items, mammals 20.0%, birds 12.0%, amphibians and reptiles 4.0%, and unknown prey 24%. Of these prey items, nestwatchers identified 1 catfish and sucker each.

Habitat Use. – The Ladders nestwatchers identified 57 separate perch locations along the Verde River. Perches spanned 2.3 km ranging from rk 161.3 to 163.6. The breeding pair spent 30.4% of the observed time at rk 162.8, 26.0% at rk 162.9, 7.5% at rk 162.2, and 36.1% at the remaining perch locations.

Luna Breeding Area (Appendix I)
Observation Period. – February 2 to June 4. Total monitoring 92 days/788 hours.

Bald Eagle Identification – The male was black VID banded "Δ/A" on his right leg, USFWS banded on the left leg, and was in adult plumage (1988 Texas nestling). The female was black VID banded "Δ/B" on her right leg, USFWS band on the left leg, and was in adult plumage (unknown origin).

Management Activities. – 1) The USFS enacted the seasonal BA closure. 2) Nestwatchers were stationed at the boat ramp to talk to fisherman launching boats. 3) One female nestling was VID banded "21/B" at 5 weeks of age.



Human Activity. – The nestwatchers recorded 1,355 human activities. Terrestrial activity of 11 different types accounted for 70.7%, watercraft (boats, float tubers, canoes/kayaks) 28.4%, and aircraft (military jets, small planes, and helicopters) 0.8%. Six activities elicited 15 significant responses from the breeding pair. The bald eagles were restless in response to 4 military jets, 2 small planes and helicopters each, and 1 gunshot. They flushed in response to 3 hunters (looking for shed elk antlers), 2 military jets, and 1 shooter.

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

Food Habits. – The nestwatchers observed 67 forage attempts. The male was successful in 91.7% (n=36) and the female in 93.5% (n=31). Of these forage attempts, 56.7% were fish, 26.9% birds, 1.5% mammals, and 14.9% unknown prey types. The breeding pair was observed delivering 51 prey items to the nest. The male delivered 60.8% and the female 39.2%. Fish comprised 60.8% of the deliveries, birds 21.6%, mammals 2.0%, and unknown prey types 15.7%. Of the 43 prey items identified to species, 72.1% were rainbow trout, 20.9% American coot, 4.7% Canada goose (*Branta canadensis*), and 2.3% grebes.

Habitat Use. – The Luna nestwatchers identified 17 separate perch locations around the lake. Perches spanned 4.8 km ranging from lk 0.3 to 5.1. The breeding pair spent 59.8% of the observed time at lk 2.4, 8.1% at lk 3.5, 6.3% at lk 2.1, 5.5% at lk 2.2, and 20.3% at the remaining perch locations.

Needle Rock Breeding Area (Appendix J)
Observation Period. – February 2 to April 29. Total monitoring 63 days/523 hours.

Bald Eagle Identification. – The male was blue VID banded on his left leg, USFWS banded on the right leg, and in adult plumage. The VID band was partially read and suggested he is the same 1998 Orme nestling previously identified as the Needle Rock male. The female was USFWS banded on her right leg, and was 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 on their lawn. 3) ABENWP contractors were active in educating the public visiting the Needle Rock Recreation Area. 4) The 1 female nestling was banded "21/C" at 6 weeks of age.

Interventions. – On May 20, the newly fledged juvenile was reported by the public in lethargic condition along the Verde River. AGFD hand-captured the fledgling and transferred it to Liberty Wildlife Rehabilitation Center. Although apparently uninjured, tests revealed probable blunt-force trauma. After 6 months of care at Liberty, a tail-mounted transmitter was attached to the juvenile and it was released in good health at Roosevelt Lake on December 6, 2007.

Figure 7. Needle Rock breeding area. Maricopa County, Arizona. Photo by J. Driscoll.

Human Activity. – Nestwatchers recorded 2,202 human activities. Terrestrial activities of 12 types accounted for 96.6%, aircraft (helicopters and small planes) 3.0%, and watercraft (canoes) 0.3%. Four activities elicited 4 significant responses from the breeding pair. The pair was restless and vocalized in response to 1 fisherman, and flushed in response to 1 hiker, canoe, and researcher each.

Food Habits. – Nestwatchers observed 72 forage events. The male was successful in 62.1% (n=29), and the female in 74.4% (n=43). Of these forage attempts, 90.3% were fish, followed by 5.6% mammals, 2.8% carrion, and 1.4% birds. The breeding pair was observed delivering 43 prey items to the nest. The male delivered 37.2% and the female 62.8%. Fish comprised 83.7% of those items, 9.3% mammals, 4.7% carrion, and 2.3% birds. No prey items were identified to species.

Habitat Use. – The Needle Rock nestwatchers identified 36 separate perch locations along the Verde River. River perches spanned a total of 5.3 km ranging from rk 25.4 to 30.7. The pair spent 16.6% of the observed time at rk 25.8, 13.1% at rk 26.8, 10.7% at rk 25.4, 9.6% at rk 25.6, 8.7% at rk 25.9, 8.5% at rk 25.7, 7.4 % at rk 28.2, and 25.4% at the remaining perch locations.

Orme Breeding Area (Appendix K)
Observation Period. – February 2 to May 25. Total monitoring 85 days/793 hours.

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

Management Activities. – 1) The Salt River Pima-Maricopa Indian Community (SRPMIC) continues to restrict non-tribal member use of the river area. 2) The SRPMIC Police visited the ABENWP contractors on a daily basis and patrolled the nesting area during times of elevated recreation use. 3) One male and 2 female nestlings were banded "20/W", "20/X" and "20/Y" at 6, 5.5, and 6 weeks of age, respectively.

Human Activity – Nestwatchers recorded 548 human activities. Aircraft (small planes, helicopters, jets, and ultralights) represented 88.0%, terrestrial activities of 13 different types 11.1%, and watercraft (rafters and kayaks) 0.9%. Eleven activities elicited 26 significant responses by the breeding pair. The bald eagles were restless to 3 helicopters, 2 small planes, picnickers, and gunshots each, and 1 rafter and camper each. The breeding pair flushed in response to 4 helicopters, 3 drivers and researchers each, 2 fishermen, and 1 hiker, gunshot, and law enforcement officer each.

Food Habits. – Nestwatchers observed 22 forage attempts. The male was successful in 81.8% (n=11) attempts, and the female in 100% (n=11). Of these forage attempts, 81.8% were fish and 9.1% were mammals and birds each. The breeding pair was observed delivering 69 prey items to the nest, of which the male delivered 55.1% and the female 44.9%. Fish comprised 88.4%, mammals 2.9%, birds 1.4%, and unknown prey types 7.2% of prey delivered. No prey items were identified to species.

Figure 8. Orme breeding area. Maricopa County, Arizona. Photo by J. Driscoll

Habitat Use. – The Orme nestwatchers identified 28 separate perch locations along the Verde and Salt Rivers. River perches spanned a total of 11.1 km ranging from rk 0.2 to 1.8 on the Verde River and rk 4.5 to 14.0 on the Salt River. The pair was seen spending 62.7% of their time at rk 0.4 (Verde River), 7.5% at rk 0.3 (Verde River), 7.1% at rk 14.0 (Salt River), 5.9% at rk 0.65 (Verde River), and 16.8% at the remaining perch locations.

Pinto Breeding Area (Appendix L)
Observation Period. – February 2 to February 20. Total monitoring 14 days/106 hours.

Bald Eagle Identification. – The male and female were blue VID banded on their left leg, USFWS banded on the right leg and were in adult plumage.

Management Activities. – 1) The USFS enacted the 1000 ft bald eagle closure. 2) The Southwestern Willow Flycatcher Closure limited recreational activities on the west side of the Salt River.

Figure 9. Pinto breeding area. Gila County, Arizona. Photo by J. Driscoll.

Human Activity. – Nestwatchers recorded 4 human activities. Terrestrial activities (hunters) and aircraft (jets and helicopters) represented 50% each. One activity elicited 2 significant responses from the breeding pair. The bald eagles flushed in response to 2 hunters.

Food Habits. – The nestwatchers observed 27 forage attempts. The male was successful in 69.6% (n=23) and the female in 100% (n=4). Of these forage attempts, 37.0% were fish, 18.5% birds, 11.1% amphibians and reptiles, 7.4% mammals, and 25.9% unknown prey types. The breeding pair was observed delivering 22 prey items to the nest. Fish comprised 40.9%, amphibians and reptiles 13.6%, birds and mammals 9.1% each, and unknown prey 27.3%. Of the 4 prey items further identified, 25.0% were catfish, smallmouth bass (*Micropterus dolomieu*), black crappie (*Pomoxis nigromaculatus*), and American coot each.

Habitat Use. – The Pinto nestwatchers identified 19 separate perch locations along the Salt River. Perches spanned 3.5 km ranging from rk 102.2 to 105.7. The breeding pair spent 33.6% of the observed time at rk 102.3, 28.0% at rk 102.6, 19.1% at rk 102.2, and 19.3% at the remaining perch locations.

Pleasant Breeding Area (Appendix M)
Observation Period. February 3 to May 3. Total monitoring 67 days/531 hours.

Bald Eagle Identification. – The male was blue VID banded "W" on his left leg, USFWS band on the right leg, and in adult plumage (1987 Horse Mesa nestling). The female was unbanded and in adult plumage (unknown origin).

Figure 10. Pleasant breeding area. Maricopa County, Arizona. Photo by J. Driscoll.

Management Activities. – 1) Maricopa County Parks and Recreation Department (MCPRD) enacted the seasonal closure around the active nest. 2) MCPRD marked closure boundaries with buoys, flags, and signs. 3) Nestwatchers were supplied a boat by USBR and educated recreationists on the closure and bald eagles. 4) The 1 male nestling was banded with a blue VID band "20/M" on his right leg on March 20. 5) AGFD unsuccessfully attempted to trap both adults for GPS transmitter deployment.

Human Activity. – Nestwatchers recorded 176 human activities. Aircraft (small planes, helicopters, ultralights, and jets) represented 62.4%, watercraft (boats, jet skis, canoes/kayaks, and waterskiers) 30.7%, and terrestrial activity (agency workers and OHVs) 6.8%. Three activities elicited 3 significant responses by the breeding pair. The bald eagles flushed once in response to a boats, agency workers, and ultralights each. Due to the location of the nest this year, the nestwatchers were out of view of the buoy line and were unable to gather data on compliance with the closure.

Food Habits. – Nestwatchers observed 11 forage attempts. The male was successful in 66.7% (n=3) attempts, and the female in 75.0% (n=4). Of these forage attempts, 90.9% were fish and 9.1% birds. The breeding pair was observed delivering 48 prey items to the nest, of which the male delivered 52.1%, the female 33.3%, and an unknown adult 14.6%. Fish comprised 56.3%, birds 14.6%, and unknown prey types 29.2%. Of the 9 prey items identified to species, 33.3% were American coots, 22.2% common carp, and 11.1% largemouth bass, smallmouth bass, channel catfish, and black crappie each.

Habitat Use. – The Pleasant nestwatchers identified 22 separate perch locations along the Agua Fria arm of Lake Pleasant. Perches spanned a total of 1.8 km ranging from rk 71.8 to 73.6. The breeding pair was seen spending 74.7% of the time at rk 73.2, 7.5% at rk 73.1, and 6.0% at rk 73.4, 5.3% at rk 73.3, and 6.5% at the remaining perch locations.

San Carlos Breeding Area (Appendix N)
Observation Period. – February 2 to May 15. Total monitoring 75 days/559 hours.

Bald Eagle Identification. – The male was blue VID banded "11/E" on his left leg, USFWS band on the right leg, and in adult plumage (2000 Doka nestling). The female was purple VID banded "Diamond D" on her left leg, USFWS band on the right leg, and in adult plumage (1989 Bartlett nestling).

Management Activities. – 1) ABENWP contractors were introduced to the San Carlos Apache Tribe (SCAT) police in an orientation session held on their first day in the field. 2) The SCAT police visited the ABENWP contractors on a daily basis. 3) SCAT established a closure around the nest tree.

Figure 11. San Carlos breeding area. Gila County, Arizona. Photo by J. Driscoll

Human Activity. – Nestwatchers recorded 93 human activities. Terrestrial activities of 7 different types accounted for 93.6% and aircraft (small planes and helicopters) accounted for 6.4%. Three activities elicited 5 significant responses from the breeding pair. The bald eagles were restless to 1 woodcutter, flushed in response to 1 hiker and helicopter each, and left the area in response to 1 helicopter and woodcutter each.

Food Habits. – Nestwatchers observed 2 forage events. The male was successful in both events. Foraging attempts were directed at 2 mammals. The breeding pair was observed delivering 78 prey items to the nest, of which the male delivered 62.8% and the female 37.2%. Of the delivered items, 50% were fish, 15.4% birds, 3.8% mammals, and 30.8% unknown prey types. Of the 13 items that could be identified to species, 38.4% were American coots, 30.8% black crappie, 15.4% carp, and 7.7% rabbit and gopher species each.

Habitat Use. – The San Carlos nestwatchers identified 15 separate perch locations along the San Carlos River. River perches spanned a total of 0.6 km ranging from rk 10.5 to 11.1. The breeding pair was seen spending 58.7% of their time at rk 10.8, 35.2% at rk 10.9, 10.8% at rk 11.4, and 6.1% at the remaining perch locations. The bald eagles also spent 235 minutes (3% of the total observed habitat use time) perched at a telephone pole away from the river (possibly near the sewage treatment ponds).

Tonto Breeding Area (Appendix O)
Observation Period. – February 3 to May 13. Total monitoring 73 days/424 hours.

Bald Eagle Identification. – The male was blue VID banded "G" on his left leg, USFWS banded on the right leg, and in adult plumage (1987 Pinal nestling). The female was blue VID banded "Backwards 3" on her left leg, USFWS banded on the right leg, and in adult plumage (1987 Horseshoe nestling).

Management Activities. – 1) 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 50 human activities; terrestrial activities of 8 different types accounted for 52% and aircraft (helicopters, small planes, military jets, and motorized parachutes) accounted for 48%. Three activities elicited 4 significant responses from the breeding pair. The bald eagles were restless in response to 1 small plane, left the area in response to 1 helicopter, and flushed from the nest tree and circled in response to nestwatchers conducting surveys in the BA on 2 occasions (nestwatchers were outside the ground closure on both occasions).

Figure 12. Tonto breeding area. Gila County, Arizona Photo by J. Driscoll.

Food Habits. – The nestwatchers observed 28 forage events. The male was successful in 44.4% (n=9), the female in 66.7% (n=12), an unknown adult in 80% (n=5), and they were unsuccessful when hunting in tandem (n=2). Of these forage events, 42.9% were directed at fish, 21.4% at birds, 7.1% at mammals, and 28.6% unknown prey types. The breeding pair was observed delivering 78 prey items to the nest, of which the male delivered 35.9%, the female 51.3%, and an unidentified adult 12.8%. Fish comprised 82.1% of delivered items, mammals 5.1%, birds 2.6%, and unknown prey types 10.3%. Of the 38 prey items identified to species, 36.8% were black crappie, 18.4% largemouth bass, 10.5% were smallmouth bass and common carp each, 7.9% channel catfish, 5.3% American coots, and 2.6% were suckers, flathead catfish (*Pylodictis olivaris*), black-tailed jackrabbits (*Lepus californicus*), and desert cottontails (*Sylvilagus audubonii*) each.

Habitat use. – The Tonto nestwatchers identified 11 separate perch locations along Tonto Creek. River perches spanned 8.0 km ranging from rk 10.0 to 18.0. The breeding pair spent 96.9% of the observed time between rk 16.4-16.9, and 3.1% at the remaining perch locations.

Tower Breeding Area (Appendix P)
Observation Period. – February 2 to May 12. Total monitoring 77 days/462 hours.

Bald Eagle Identification. – The male was purple VID banded "Diamond 8" on his left leg, USFWS banded on the right leg, and in adult plumage (1989 Ladders nestling). The female was unbanded and in adult plumage (unknown origin).

Management Activities. – 1) The USFS enacted a seasonal breeding area closure surrounding the nest area. 2) The USFS posted closure signs at the upstream and downstream access points to the Verde River. 3) The USFS provided contractors with a camping trailer. 4) Two male nestlings were VID banded "20/R" and "20/S" at 6 weeks of age.

Human Activity. – Nestwatchers recorded 263 human activities. Terrestrial activities of 12 different types accounted for 80.9%, aircraft (small planes and helicopters) 17.1%, and watercraft (canoes/kayaks) 1.9%. Three activities elicited 14 significant responses from the breeding pair. The bald eagles were restless in response to 3 trains and 2 cattle and researchers each. They flushed in response to 7 passing trains.

Figure 13. Tower breeding area. Yavapai, County, Arizona. *Photo by J. Driscoll.*

Food Habits. – Nestwatchers observed 11 forage events. The male was successful in 71.4% (n=7) and the female was successful in 50% (n=4). All of these forage attempts were directed at fish. The breeding pair was observed delivering 71 prey items to the nest, of which the male brought 45.1%, the female 42.2%, and an unknown adult 12.7%. Fish comprised 45.1%, mammals 7.0%, and unknown prey types 47.9%. Of the 7 items identified to species, 71.4% were rabbits, and 14.3% were catfish and suckers each.

Habitat Use. – The Tower nestwatchers identified 59 separate perch locations along the Verde River. River perches spanned a total of 4.4 km ranging from 247.1 to 251.5. The pair spent 25.8% of the observed time at rk 248.1, 15.8% at rk 247.2, 11.3% at rk 248.0, 10.4% at rk 248.5, 6.7% at rk 247.8, 6.2% at rk 247.7, and 23.8% at the remaining perch locations.

MANAGEMENT CONSIDERATIONS

Management considerations included below are taken directly 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. Extend the closure boundary south to the Fort McDowell Yavapai Nation property boundary.
2. Close the north and south campgrounds, and close the riparian area to vehicle/OHV entry to allow riparian vegetation to grow back. If closing the campgrounds is not possible, then increase the law enforcement presence.
3. Conduct a contaminant study (sample the water and fish) of the golf course ponds in Rio Verde where the bald eagles forage.

4. Signs are needed in Spanish to match the English ones in the north campground which read "East side of river closed, Bald Eagle breeding area".
5. The airstrip should be regulated or closed entirely.
6. Close the gates to FR 160 during the breeding season to prevent potential OHV access to the closure area.
7. Sign all access points on the east end of FR 160 to the let people know the west end is closed before they drive the entire length to find out.

Canyon de Chelly Breeding Area
1. Place monofilament recycling bins and/or trash cans around the lake.

Crescent Breeding Area
1. Continue Nestwatch program at the Crescent BA
2. Finalize, sign, and implement a seasonal closure of the entire nesting knoll from February 1 to August 15.
3. Close access to west boat ramp during the 2 weeks post-fledging.

Ladders Breeding Area
1. Clearly sign the closure throughout the breeding area including entering and exiting closure signs.

Luna Breeding Area
1. Continue Nestwatch program at the Luna BA.
2. Maintain closure boundaries, including Group Campsite A, as they currently exist.
3. Establish islands by cutting off ends of peninsulas to benefit breeding waterfowl.
4. Consider repainting or replacing weather worn signage for the waterfowl closure.

Needle Rock Breeding Area
1. Consider establishing a horse path along the Eastern shoreline of the river to provide respite from heavy OHV activity.

Orme Breeding Area
1. Continue to keep SRPMIC closed to non-tribal members.
2. Plant and fence riparian cottonwoods for future bald eagle habitat.
3. Continue to give presentations on bald eagle management at McDowell Mountain Regional Park.

Pinto Breeding Area
1. Continue enacting the water closure during high lake levels.

Pleasant Breeding Area
1. Move the "No Wake Buoys" (that were near the nestwatch OP) farther downstream to allow nestwatchers more time to intercept violators, only if nest #3 is used by the bald eagles again.
2. Increase efforts to address FAA related issues, specifically low-flying vintage or replica World War aircraft.
3. Continue marking buoy lines with orange flags.
4. Advise law enforcement aircraft of the nest location to avoid disturbance.

San Carlos Breeding Area
1. Continue to implement the Nestwatch program at San Carlos.
2. Continue giving presentations to local high school science classes.
3. Place closure signs under the railroad bridge.
4. Provide a training session with local law enforcement at the start of the season.

Tonto Breeding Area
1. Post informative signs at the Indian Point boat ramp and other launch sites for motorized parachutes.
2. Place no wake buoy lines in areas of drowned thickets and river inflows to protect aquatic bird nesting habitat.
3. Place wildlife closure signs along A-cross road and use boulder barriers to prevent OHV and other motorized vehicles from entering the closure from the North.
4. Maintain a minimum of 300 meter closure surrounding the nest tree.

Tower Breeding Area
1. Enforce grazing restrictions along the Verde River.
2. Post signs along the river with instructions on how to report illegal grazing.
3. Nestwatchers should give presentations to local schools.
4. Provide a map of the river that identifies access points for recreation.
5. Focus education efforts toward OHV recreation and pilots.
6. The closure sign at the gauging station should include dates.

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APPENDIX A: 2007 ARIZONA BALD EAGLE WINTER COUNT RESULTS

Table 8. 2007 Arizona bald eagle winter count volunteer survey results.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Apache County						
1	Becker Lake	15	2	1	0	0
2	Little Colorado River (LCR)	10	1	0	0	0
3	S. Fork LCR – Campground	15	0	0	0	0
4	Casa Malapais – LCR	5	0	0	0	0
5	Greer Lakes (River, Bunch, and Tunnel Reservoirs)	25	0	0	0	0
6	Sponseller Lake	15	0	0	0	0
7	Mexican Hay Lake	60	0	0	0	0
8	White Mountain Hereford Ranch (Trinity, Glen Livet, McKay reservoirs)	60	0	0	0	0
9	The Ranch Lake	20	2	0	0	0
10	Ortega Lake	35	0	0	0	0
11	Concho Lake	20	1	0	0	0
12	Luna Lake	54	2	0	0	0
13	Nelson Reservoir	40	4	1	0	0
14	Nutrioso Reservoir	30	0	1	0	0
16	San Francisco River (Alpine RD to New Mexico	195	0	0	0	0
Total		**599**	**12**	**3**	**0**	**0**
Cochise County						
18	Parker Canyon Lake	90	1	0	0	0
19	Willcox Playa	220	0	0	0	0
Total		**310**	**1**	**0**	**0**	**0**
Coconino County						
21	Long Lake Complex	360	1	0	0	0
22	Stoneman Lake	230	1	0	0	1
23	FH-3	60	1	0	0	0
24	I-17, Section to Flagstaff	185	5	1	1	0
25	Bellemont	280	1	0	0	1
26	Townsend/Winona A/B	405	3	0	0	1
27	HWY 89 North /Sunset Crater – Wupatki	300	5	0	0	0
28	FH-3 Lakes (Mary, Mormon, Marshall, Prime, etc.)	245	18	11	0	0
29	Continental Country Club Lakes	125	1	0	0	0
30	Chevelon Canyon Lakes	90	2	0	0	0
32	Spring Valley Wash	180	0	0	0	0
33	Red Lake Valley	20	1	0	0	0
34	Kaibab Lake	15	3	0	0	0
35	Pittman Valley	71	2	0	0	0
36	Davenport Lake	31	1	0	0	1
37	Scholz Lake	90	1	0	0	0
38	Cataract Lake	30	0	0	0	1
39	Willow Springs Lake	80	1	0	0	0
40	West Chevelon Canyon	112	1	1	0	1
41	Willow Creek	110	0	0	0	1
42	White Horse Lake – Pomeroy Tanks	30	2	0	0	0
43	JD Dam Lake	20	1	0	0	0

Table 8. continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
45	Steel/Stone Road	90	1	0	0	0
48	Blue Stem Wash-Babbit property	120	0	0	0	0
49	Glen Canyon Nat'l Rec. Area (Lee's Ferry	80	0	0	0	0
118	Bill Williams Loop Road	195	5	1	0	0
119	Johnson Canyon	300	0	0	0	0
120	Highway 64 east	180	0	0	0	0
121	Highway 64	60	0	0	0	0
122	Camp Navajo	120	1	0	0	0
123	Partridge Creek	6	0	2	0	0
124	Odell Lake	70	1	1	0	0
125	Highway 87 north	95	0	0	0	0
126	Highway 180	190	0	0	0	0
Total		**4575**	**59**	**17**	**1**	**7**
Graham County						
51	Point of Pines Lake area	Not surveyed.				
Mohave County						
54	Lake Mohave[1]	546	0	3	0	0
56	Lake Mead, Temple Bar[1]	2289	6	15	0	0
57	Alamo Lake	85	1	1	0	0
Total		**2920**	**7**	**19**	**0**	**0**
Navajo County						
58	Lake of the Woods	25	2	2	0	0
59	Rainbow Lake	30	3	5	0	0
61	Whipple Lake	20	0	0	0	0
62	Long Lake	65	0	0	0	0
63	Lone Pine Dam	120	0	0	0	0
64	Schoens Reservoir	150	0	0	0	0
65	White Mountain Lake	45	0	2	0	0
67	Jacques Marsh	70	1	0	0	0
68	Scott's Reservoir	20	0	0	0	0
69	Show Low Lake	25	2	0	0	0
70	Pintail Lake	15	0	0	0	0
71	Telephone Lake	40	1	3	0	0
72	Fool Hollow Lake	195	7	1	0	0
75	Cottonwood Wash/ Clay Springs	45	0	0	0	0
76	White Lake	7	1	0	0	0
127	Mortenson Wash	30	0	0	0	0
Total		**902**	**17**	**13**	**0**	**0**
Santa Cruz County						
82	Pena Blanca Lake	120	0	0	0	0
Yavapai County						
83	Wet Beaver Creek	Not surveyed.				
84	Oak Creek	540	2	0	0	0
85	Willow Lake	240	0	0	0	0
86	Lynx Lake	240	2	0	0	0
87	Watson Lake	210	0	0	0	0
88	Goldwater Lake	195	2	2	0	0
Total		**1425**	**6**	**2**	**0**	**0**
Yuma and La Paz Counties						
89	Imperial N.W.R. Cibola/Martinez Lake – Colorado River	90	2	1	0	0

Table 9. 2007 Arizona bald eagle winter count helicopter survey results.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
90	Verde River	98	16	6	0	0
91	Lower East Verde River	12	0	0	0	0
92	Lower West Clear Creek	Not surveyed.				
93	Lower Salt River	76	14	7	0	0
94	Upper Salt River	77	7	0	0	0
95	Lower Tonto Creek	26	2	0	0	0
97	Lower Canyon Creek	11	0	0	0	0
98	Lower Cibecue Creek	13	0	0	0	0
100	White River	15	3	0	0	0
101	North Fork White River	32	3	1	0	0
102	Lower Black River	52	26	10	0	0
103	Big and Little Bonito Creeks	19	1	0	0	0
104	San Carlos River - Talkalai Lake	19	4	0	0	0
105	San Carlos Reservoir	41	2	1	0	0
106	Upper and Lower Gila River	47	1	0	0	0
107	Eagle Creek	34	4	0	0	0
108	Bonita Creek	13	0	0	0	0
109	Lower San Francisco River	23	2	0	0	0
110	Blue River	11	0	0	0	0
111	Sunrise Lake	2	1	0	0	0
112	Big Lake	2	2	0	0	0
114	Crescent Lake	2	0	0	0	0
115	Lake Pleasant	34	0	1	0	0
116	Del Rio Ponds	Not surveyed.				
117	Tres Rios	32	0	0	0	0
Total		**691**	**88**	**26**	**0**	**0**

[1]Eagles counted on Lakes Mead and Mohave are included in this summary only if they were documented on the Arizona side of the state line.

Table 10. 2007 Arizona bald eagle winter count non-standardized survey route results.

Route Name	County	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Sierra Blanca Lake (989)	Apache	25	1	0	0	0
Spring Valley Road	Coconino	120	0	0	0	0
Blue Ridge Reservoir	Coconino	157	1	1	0	0
Kachina Wetlands (986)	Coconino	30	2	0	0	0
HWY 87 South (991)	Coconino	100	2	1	0	0
Lake Mohave (992)	Mohave	392	2	2	0	2
Camp Verde (993)	Yavapai	30	0	0	0	0
Total		**854**	**8**	**4**	**0**	**2**

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 mateing 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: 2007 ARIZONA BALD EAGLE PRODUCTIVITY

Table 11. Arizona bald eagle breeding area productivity summary, 2007.

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Alamo	S	7	1/11-29	2+	1/29-3/7	2	2	4/13-5/21
Bartlett	F	2	1/19-29	2+	2/14-3/12	2	Failed 3/12-4/13	
	Nestlings last seen in nest on 3/12 at <1 week old.							
Beaver	S	1	<1/29	2+	1/29-3/15	2	2	4/13-5/11
Becker	U							
Blue Point	F	10	<1/8	Failed 1/8-2/9.				
Box Bar*	S	3	12/20-1/5	2+	>2/3	2	2	4/22
Bulldog	F	1	1/8-22	2+	2/9-3/16	2	Failed 3/16-4/20	
	Nestlings last seen in nest on 3/16 at 3 weeks old.							
Burro	F	1	<2/12	2	Failed 3/29-4/2			
Canyon	U							
Canyon de Chelly*	S	1	2/23	2+	4/2	2	2	6/21
Cedar Basin	O							
Cibecue	F	2	1/9-2/9	1+	Failed 2/9-3/16.			
Cliff	F	6	1/29-3/15	1+	Failed 3/23-4/13			
Coldwater	S	3	1/29-3/15	1+	3/15-4/13	2	2	>5/21
Coolidge*	F	2	1/29-3/15	1+	3/7-3/28	1	Failed 3/28-4/20	
	Nestling last seen in nest on 3/28 at 1.5 weeks old.							
Crescent*	S	2	<5/7	2+	<5/7	2	2	7/25
Doka	F	4	1/5-29	1+	1/29-3/15	1	Failed <4/13	
	One nestling on ground below nest on 4/13. Taken to rehab.							
Dupont	U							
East Verde	F	6	<1/29	1+	Failed 4/13-5/11			
Fish Creek	F	1	1/8-2/9	1+	Failed 3/16-4/20			
Fort McDowell	F	17	1/5-29	2+	1/29-3/15	2	Failed 4/14-5/11	
Granite Basin	F	1	2/9-3/16	1+	3/16-4/20	1	Failed 4/20-5/31	
Granite Reef*	S	2	1/8-29	1+	3/6-3/8	1	1	5/30
Horse Mesa	F	4	<1/8	1+	Failed 2/9-3/16.			
Horseshoe	S	11	1/5-29	2+	2/12-3/15	1	1	>5/21
Ive's Wash	F	3	1/11-29	2+	1/29-3/9	2	Failed 4/13-5/21	
Ladders*	S	3	<1/29	3	3/2	3	2	6/1-6/4
	One nestling died in nest 3/17.							
Lone Pine	S	5	1/9-2/9	2+	2/9-3/16	2	2	>5/31
Lower Lake Mary	O							
Luna*	S	1	1/28	2+	3/3	2	2	5/27
Lynx	S	2	<1/29	2+	2/26	2	1	5/13
	One nestling died in nest 4/11.							
Needle Rock*	S	2	1/5-29	2	2/23-25	1	1	4/13-5/17
Oak Creek	S	4	<1/29	2+	2/13-21	2	1	4/13-5/11
	One nestling dead below nest on 4/13.							
Orme*	S	6	1/8-29	3	2/16	3	3	5/11, 5/13, 5/19
Perkinsville	F	4	2/2-3/1	1+	3/15-4/13	1	Failed 5/11-5/21	
Pinal	O							
Pinto*	F	4	<2/2	2+	>2/2	2	Failed 2/20.	
	Nestlings died in nest on 2/20 after cold storm.							

[1] Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.

[2] Nest numbers are from Hunt and others 1992; Driscoll and Beatty 1994; Driscoll and others 1992,1995a, 1995b, 1997, 1998, 1999, 2001; Koloszar and Driscoll 2002; Canaca and others 2003.

* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 11. continued.

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Pleasant*	S	3	1/8-29	1+	2/8	1	1	5/9
Redmond	F	5	1/8-2/9	1+	Failed 4/20-5/31.			
Rock Creek	U							
Rodeo	S	3	1/5-1/29	2+	2/9	2	2	4/13-5/11
San Carlos*	S	4	1/8-2/2	2+	2/11-16	2	1	5/13
	One nestling fell from nest and died on 3/18.							
76	S	4	2/9-20	1+	4/5-20	1	1	>5/31
Sheep	F	4	1/8-2/9	1+	Failed 2/9-3/16.			
Suicide*	S	1	1/8-2/2	3	3/11	3	2	>5/12
Sullivan Lake	F	2	1/29-2/20	1+	Failed 3/26			
Sycamore	S	4	<1/5	2+	2/2-3/15	2	2	4/13-5/11
Table Mountain	F	4	1/29-3/15	1+	Failed 3/15-4/13			
Talkalai*	S	7	1/8-2/2	2+	2/7-21	2	2	5/6-5/13
Tonto*	S	4	1/8-23	2+	2/22	2	2	5/6, 5/6-5/11
Tower*	S	8	<1/8	2+	2/17	2	2	5/11
Winkelman	U							
Yellow Cliffs	S	2	2/2-3/6	2+	3/6-3/16	2	2	>5/21

[1] Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.

[2] Nest numbers are from Hunt and others 1992; Driscoll and Beatty 1994; Driscoll and others 1992,1995a, 1995b, 1997, 1998, 1999, 2001; Koloszar and Driscoll 2002; Canaca and others 2003.

* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

APPENDIX D: NEST SURVEY RESULTS

Table 12. Results of the 2007 winter count, ORA, and Nest Survey Flights.

Location	Time	Comments
January 5, 2007		
Orme	0735	All known nests empty. Two adults perched in area.
Rodeo	0738	One adult standing in nest #3, second adult perched in tree.
Sycamore	0745	One adult incubating in nest #4, second adult perched on snag.
Doka	0748	Two adults perched south of nest #3.
Fort McDowell	0750	All known nests empty. Two adults in area.
Box Bar	0757	One adult incubating in nest #3.
Needle Rock	0759	All known nests empty. No bald eagles.
Bartlett	0804	All known nests empty. One adult in area.
Yellow Cliffs	0813	All known nests empty. Two adults in area.
Cliff	0825	All known nests empty. One subadult in area.
Horseshoe	0847	All known nests empty. Fresh lining in nest #11.
Table Mountain	0857	All known nests empty. No bald eagles.
LF Ranch	0925	No new nests or bald eagles.
Pleasant	1122	All known nests empty. No bald eagles.
January 8, 2007		
Granite Reef	0732	One adult perched in nest tree #2, second adult in area.
Bulldog	0743	Two adults standing in nest #1.
Blue Point	0745	One adult incubating in nest #10. Two adult bald eagles perched across from Bagley Flat.
Horse Mesa	0825	One adult incubating in nest #4, second adult flying over lake.
Tonto	0849	One adult standing in nest #4.
Sheep	0853	All known nests empty. One adult bald eagle in area.
76	0904	All known nests empty. No bald eagles.
Pinto	1140	Nest #6 empty. No bald eagles.
Pinal	1147	All known nests empty. No bald eagles.
Redmond	1157	One adult standing in nest #5.
Gleason Flat	1215	No new nests. One adult bald eagle in area.
Canyon	1232	All known nests empty. No bald eagles.
Talkalai	1400	Two adults at nest #7.
San Carlos	1411	Two adults near new tree nest #4. Nest #3 fallen.
Suicide	1446	Two adults at nest #1 with fresh lining.
Coolidge	1456	All known nests empty. No bald eagles.
Granite Basin	1540	All known nests empty. No bald eagles.
Winkelman	1550	Nest #1 gone. No bald eagles.
January 9, 2007		
Cibecue	1010	All known nests empty. One adult perched in area of nest #2.
Mule Hoof historical BA	1024	All known nests empty. No bald eagles.
Cedar Basin	1043	All known nests empty. Two adults in area.
Lone Pine	1053	All known nests empty. Two adults in area.
Crescent	1202	All known nests empty. No bald eagles.
January 10, 2007		
Willow nest site	940	No new nests or bald eagles.
Eagle nest site	1004	No new nests. One adult in area.
January 29, 2007		
Granite Reef	0736	One adult incubating in nest #2.
Orme	0738	One adult incubating in nest #6. Second adult in area.
Rodeo	0740	One adult incubating in nest #3.
Sycamore	0744	One adult incubating in nest #4.
Doka	0750	One adult incubating in new snag nest #4. Second adult in area.
Fort McDowell	0753	One adult incubating in nest #17.

Table 12. continued.

Location	Time	Comments
Box Bar	0758	One adult incubating in nest #3. Second adult in nest.
Needle Rock	0759	One adult incubating in nest #2. Second adult in area.
Bartlett	0805	One adult incubating in nest #2.
Yellow Cliffs	0812	Nest #2 with fresh lining. Two adults in area.
Cliff	0820	All known nests empty. One adult in area.
Horseshoe	0837	One adult incubating in nest #11.
Table Mountain	0850	All known nests empty. One adult in area.
East Verde	0903	One adult incubating in nest #6. Two other adults in area.
Coldwater	0915	All known nests empty. No bald eagles.
Ladders	0924	One adult incubating in nest #3.
West Clear Creek	0945	One Small nest with egg inside. One adult in area.
Camp Verde historical BA	1005	No new nests or bald eagles.
Beaver	1014	One adult incubating in nest #1. Second adult in area.
Oak Creek	1023	One adult incubating in nest #4.
Tower	1218	One adult incubating in nest #8. Second adult in area.
Mormon Pocket	1224	All known nests empty. No bald eagles.
Perkinsville	1226	Nest #4 with fresh lining. One adult in area.
Hell Point historical BA	1245	All known nests empty. One adult bald eagle in area.
Muldoon nest site	1250	All known nests empty. No bald eagles.
Granite nest site	1257	All known nests empty. No bald eagles.
Sullivan nest site	1303	All known nests empty. No bald eagles.
Sullivan Lake	1310	One new large nest with 2 adults perched in area.
Lynx	1326	One adult incubating in nest #2. Second adult in area.
Alamo	1500	One adult incubating in nest #7.
Ive's Wash	1510	One adult incubating in nest #3.
Pleasant	1557	One adult incubating in nest #3.
February 9, 2007		
Orme	0940	One near adult bald eagle perched in nest #5 tree.
Bulldog	0945	One adult incubating in nest #1.
Blue Point	0949	Nesting attempt failed. No bald eagles.
Fish Creek	1003	New BA with 1 adult incubating in nest #1 (Horse Mesa nest #2).
Horse Mesa	1007	One adult incubating in nest #4. Second adult in area.
Rock Creek	1010	Nest #2 empty, nest #3 not found. No bald eagles.
Tonto	1022	One adult incubating in nest #4.
Sheep	1026	One adult incubating in nest #4.
76	1036	Two adults standing in nest #4.
Dupont	1050	Nest #2 fallen. No new nests or bald eagles.
Pinto	1105	One adult brooding nestlings in nest #4.
Pinal	1110	Nest #6 with fresh lining. No bald eagles.
Redmond	1117	One adult incubating in nest #5.
Canyon	1132	All known nests empty. No bald eagles.
Cibecue	1248	One adult in nest #2 with 1 egg. Second adult in area.
Mule Hoof historical BA	1257	All known nests empty. No bald eagles.
Cedar Basin	1305	All known nests empty. No bald eagles.
Lone Pine	1314	One adult incubating in nest #5. Second adult and 5 subadults in area.
Point of Pines	1443	No new nests. Two adult bald eagles in area.
Dry Lake	1448	No new nests. Five subadults and 1 adult bald eagle.
Talkalai	1515	One adult incubating in nest #7.
San Carlos	1519	One adult incubating in new nest #4.
Suicide	1523	One adult incubating in nest #1. Second adult in area.
Coolidge	1528	All known nests empty. No bald eagles.
Granite Basin	1535	All known nests empty. No bald eagles.
Winkelman	1545	No new nests or bald eagles.

Table 12. continued.

Location	Time	Comments
March 15, 2007		
Granite Reef	0739	One adult brooding.
Orme	0740	One adult in nest with 3 3-4 week old nestlings. Second adult in area.
Rodeo	0743	One adult in nest with 2 3-week old nestlings. Second adult in area
Sycamore	0750	Two 6 week old nestlings in nest. One adult in area.
Doka	0755	One adult in nest with 1 3-week old nestling. Second adult in area.
Fort McDowell	0756	One adult in nest with 1 1-week old nestling. Second adult in area.
Needle Rock	0802	One adult in nest with 1 2.5-week old nestling.
Bartlett	0806	One adult in nest with 2 1-week old nestlings.
Yellow Cliffs	0811	One adult in nest #2 with 2.5-week old nestlings.
Cliff	0823	One adult incubating in new tree nest #6. Second adult in area.
Horseshoe	0833	One adult brooding.
Table Mountain	0839	One adult incubating in nest #4.
East Verde	0845	One adult incubating. Second adult in area.
Coldwater	0858	One adult incubating in nest #3.
Ladders	0905	One adult brooding. Second adult arrived with fish.
West Clear Creek	0922	One small nest in poor condition with egg. No bald eagles.
Camp Verde Historical BA	0929	No new nests or bald eagles.
Beaver	0932	Two 5-week old nestlings in nest. One adult in area.
Oak Creek	0940	One adult in nest with 2 3-week old nestlings.
Oak Creek to Sedona	0953	No new nests or bald eagles.
Tower	1148	One adult in nest brooding 3-4 week old nestlings.
Perkinsville	1155	One adult incubating in nest #4.
Hell Point historical BA	1208	One adult golden eagle incubating in nest #2.
Muldoon nest site	1217	No new nests or bald eagles.
Granite nest site	1220	All known nests empty. No bald eagles.
Sullivan nest site	1230	All known nests empty. No bald eagles.
Sullivan Lake	1237	New BA with 1 adult incubating in new tree nest #2.
Watson Lake	1249	All known nests empty. No bald eagles.
Lynx	1252	Adult in nest with 2 3-week old nestlings.
Burro Creek	1330	New BA with 1 adult incubating in new tree nest #1. Second adult in area.
Pleasant	1443	One adult in nest with 1 4.5-week old nestling.
March 16, 2007		
Orme	0718	Nest #5 empty. One subadult in area.
Bulldog	0725	Two 3-week old nestlings in nest.
Blue Point	0728	All known nests empty. No bald eagles.
Fish Creek	0740	One adult incubating.
Horse Mesa	0745	Nesting attempt failed. No bald eagles.
Rock Creek	0749	All known nests empty. No bald eagles.
Tonto	0801	Two 3.5-week old nestlings in nest. One adult perched above nest
Sheep	0806	Nesting attempt failed. Two adults perched downstream.
76	0813	One adult incubating in nest #4.
Dupont	0832	All known nests empty. No bald eagles.
Pinto Creek nest site	0851	Did not find nest. No bald eagles.
Pinto	0856	Nesting attempt failed. Remains of nestlings in nest.
Pinal	0859	All known nests empty. No bald eagles.
Redmond	0904	One adult incubating.
Cibecue	1035	Nesting attempt failed. No bald eagles.
Mule Hoof historical BA	1037	All known nests empty. No bald eagles.
Cedar Basin	1050	All known nests empty. Two adults in area.
Lone Pine	1110	One adult brooding.
Talkalai	1257	One adult in nest with 2 3.5-week old nestlings. Second adult in tree.
San Carlos	1303	One adult brooding 2 3.5-week old nestlings.

Table 12. continued.

Location	Time	Comments
Suicide	1309	One adult in nest with 2 2.5-week old nestlings.
Coolidge	1310	One adult incubating in nest #2.
Granite Basin	1337	One adult incubating in nest #1.
Winkelman	1345	No new nests or bald eagles.
April 13, 2007		
Granite Reef	0725	One 5-week old nestling in nest.
Orme	0728	Three 7-week old nestlings in nest. Both adults in area.
Rodeo	0730	Two 7-week old nestlings in nest.
Sycamore	0734	Two 10-week old nestlings in nest.
Doka	0737	One 7-week old nestling alive on ground below nest. Both adults perched in nest tree. Nestling was rescued after flight.
Fort McDowell	0740	One adult in nest with 2 4-week old nestlings.
Needle Rock	0745	One 7-week old nestling in nest. One adult in area.
Bartlett	0755	Nesting attempt failed. One adult in area.
Yellow Cliffs	0800	One adult in nest with 2 4-week old nestlings.
Cliff	0815	Failed nesting attempt. One adult perched in nest tree.
Horseshoe	0824	One 6-week old nestling in nest.
Table Mountain	0829	Nesting attempt failed. No bald eagles.
East Verde	0836	One adult incubating. Second adult in area.
Coldwater	0842	Two 3-week old nestlings in nest.
Ladders	0846	Two 5.5-week old nestlings in nest.
Camp Verde Historical BA	0854	No new nests or bald eagles.
Beaver	0857	Two 8.5-week old nestlings in nest.
Beaver Creek (to McGuireville)	0858	No new large nests or bald eagles.
Oak Creek	0911	One 6.5-week old nestling in nest. Second nestling dead below nest.
Tower	0948	Two 7.5-week old nestlings in nest.
Mormon Pocket	0953	All known nests empty. No bald eagles.
Perkinsville	0956	One 4-week old nestling in nest.
Hell Point historical BA	1005	Golden eagle nesting attempt failed. No bald eagles.
Muldoon nest site	1010	All known nests empty. No bald eagles.
Granite nest site	1014	All known nests empty. No bald eagles.
Sullivan nest site	1015	All known nests empty. No bald eagles.
Sullivan Lake	1020	Nesting attempt failed. No bald eagles. Great Horned Owls in nest #3.
Watson Lake	1031	All known nests empty. No bald eagles.
Lynx	1037	One 7-week old nestling in nest. Second nestling died a week earlier.
Alamo	1233	Two 10-week old nestlings in nest.
April 20, 2007		
Orme	0635	Nest #5 not found. One adult and 1 subadult in area of Blue Point bluffs.
Bulldog	0646	Nesting attempt failed. No bald eagles.
Fish Creek	0654	Nesting attempt failed. No bald eagles.
Horse Mesa	0657	All known nests empty. No bald eagles.
Tonto	0704	Two 8-week old nestlings in nest. One adult in area.
Sheep	0706	All known nests empty. No bald eagles.
76	0715	One adult in nest brooding. Second adult in area.
Pinal	0740	All known nests empty. No bald eagles.
Redmond	0743	One adult incubating.
Lone Pine	0906	One adult in nest with 2 3-week old nestlings.
Talkalai	1038	Two 8-week old nestlings in nest. One adult in area.
San Carlos	1044	One 8-week old nestling in nest. One adult in area.
Suicide	1048	Two 7-week old nestlings in nest.
Coolidge	1052	Failed nesting attempt. No bald eagles.
Granite Basin	1117	One adult in nest with 1 3-week old nestling.

Table 12. continued.

Location	Time	Comments
May 11, 2007		
Granite Reef	0714	One 8.5-week old nestling in nest.
Orme	0716	Two 10-week old nestlings in nest. Third nestling not seen.
Rodeo	0718	Two 11-week old nestlings branching from nest. Two adults in area.
Sycamore	0723	Two fledglings and 1 adult near river.
Doka	0725	New nest #4 tree fell.
Fort McDowell	0738	Nesting attempt failed. No bald eagles.
Needle Rock	0743	One 11-week old nestling in nest.
Yellow Cliffs	0752	Two 8.5-week old nestlings in nest. One adult in area.
Horseshoe	0801	One 9.5-week old nestling branching from nest. One adult in area.
Table Mountain	0806	All known nests empty. No bald eagles.
East Verde	0812	All known nests empty. No bald eagles.
Coldwater	0821	Two 7-week old nestlings in nest. One adult in area.
Ladders	0827	Two 9.5-week old nestlings in nest. One adult in area.
Camp Verde Historical BA	0835	No new nests or bald eagles.
Beaver	0837	One fledgling, did not see second fledgling.
Oak Creek	0841	One fledgling flew from nest.
Perkinsville	0854	One 8-week old nestling in nest.
Oak Creek (Sedona to confluence with Verde)	0940	No new nests or bald eagles.
White Horse Lake	1010	Three new large tree nests #1, 2, and 3. One osprey incubating in nest #1. No bald eagles.
Lower Lake Mary	1031	All known nests empty. No bald eagles.
Upper Lake Mary	1047	Two new large tree nests #3 and #4. No bald eagles. Osprey incubating in nests #1 and 2.
Marshall Lake	1055	No new nests or bald eagles.
Ashurst Lake	1102	No new nests or bald eagles.
Kinnikinick Lake	1110	No new nests or bald eagles.
Tremaine/Soldier Annex/Long Lakes	1115	All known nests empty. No bald eagles.
Blue Ridge Reservoir	1310	Three new large nests #2, 3, and 4. Ospreys incubating in nests #2 and #3. No bald eagles.
Knoll Lake	1321	All known nests empty. No bald eagles.
Bear Canyon Lake	1340	No new nests or bald eagles.
Woods Canyon Lake	1354	No new nests or bald eagles.
Willow Springs Lake	1402	Osprey nest #1 active. No bald eagles.
May 21, 2007		
Granite Reef	0715	One 10-week old nestling branching from nest.
Orme	0716	Two fledglings by river, third not seen. Both adults in area.
Rodeo	0723	One fledgling in area, second not seen.
Sycamore	0728	Two fledglings by river. Both adults in area.
Yellow Cliffs	0741	Two 9.5-week old nestlings in nest.
Horseshoe	0750	One 10.5-week old nestling in nest.
Coldwater	0804	Two 8-week old nestlings in nest.
Ladders	0808	Two 10.5-week old nestlings in nest. One adult in area.
Beaver	0814	Two fledglings and 1 adult in area.
Oak Creek	0820	One fledgling in area.
Perkinsville	0833	Nesting attempt failed. No bald eagles.
Alamo	1050	One fledgling in area, second not seen. Both adults in area.
Ive's Wash	1055	Nesting attempt failed. Remains of nestlings in nest. No adults in area.
May 31, 2007		
76	0806	One 9-week old nestling in nest.
Redmond	0827	Nesting attempt failed. No bald eagles.
Lone Pine	0955	Two 10.5-week old nestlings branching from nest.

Table 12. continued.

Location	Time	Comments
Crescent	1020	Two 3-week old nestlings in new snag nest #2. One adult in area.
Granite Basin	1159	Nesting attempt failed. No bald eagles.

APPENDIX E: BOX BAR BREEDING AREA SUMMARY

Table 13. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2007.

Human Activity	N[1]	W	F	L	U	Total	Percent
Helicopters	12	4	1	--	5	22	28.2
Campers	--	12	--	--	--	12	15.4
Gunfire	4	6	--	--	--	10	12.8
Small planes	3	5	--	--	1	9	11.5
OHVs/dirt bikes	1	4	--	1	--	6	7.7
Motorized parachutes	--	3	2	--	--	5	6.4
Drivers	2	2	--	--	--	4	5.1
Hikers	2	2	--	--	--	4	5.1
Fishmen	1	--	--	--	--	1	1.3
Hunters	--	1	--	--	--	1	1.3
Kayaks/canoes	1	--	--	--	--	1	1.3
Horseback riders	--	--	--	--	1	1	1.3
Researchers	--	--	--	1	--	1	1.3
Tubers	1	--	--	--	--	1	1.3
Total	27	39	3	2	7	78	

[1]Bald eagle behavior, N=none, W=watched, F=flushed, L=left area, U=unknown.

Table 14. Observed forage events and success, Box Bar BA, Arizona, 2007.

Sex	Fish		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	3	2-1	1	0-1	4	2-2
Female	4	3-1	--	--	4	3-1
Unknown	1	1-0	--	--	1	1-0
Total	8	6-2	1	0-1	9	6-3

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

Table 15. Observed prey types delivered to the nest, Box Bar BA, Arizona, 2007.

Sex	Fish	Mammals	Birds	Unknown	Total	Percent
Male	34	2	1	6	43	49.4
Female	32	1	2	7	42	48.3
Unknown	1	--	--	1	2	2.3
Total	67	3	3	14	87	
Percent	77.0	3.5	3.5	16.1		

Table 16. Observed prey species delivered to the nest, Box Bar BA, Arizona 2007.

Sex	Fish					Birds			Mammals		Total	Percent
	TL[1]	SU	CP	BA	CC	CM	AC	MH	RS	GS		
Male	10	2	1	1	1	--	1	--	1	1	18	58.1
Female	4	2	3	--	--	1	--	1	1	--	12	68.7
Unknown	1	--	--	--	--	--	--	--	--	--	1	3.2
Total	15	4	4	1	1	1	1	1	2	1	31	
Percent	48.4	12.9	12.9	3.2	3.2	3.2	3.2	3.2	6.4	3.2		

[1]TL=tilapia, SU=sucker, CP=carp, BA= bass sp., CC=channel catfish, CM= common merganser, AC=American coot, MH=common moorhen, RS=rock squirrel, GS=ground squirrel.

Table 17. Bald eagle habitat analysis at the Box Bar BA, Arizona, 2007.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
21.5	MS	Left	No	1	RU	UP
22.0	MS	Right	No	1	RU	UP
22.2a	ST	Right	No	1	PN	GC
22.2b	WO	Right	No	1	PN	GC
22.9	CL	Left	Partial	2	RI	CW
23.1	HL	Left	Partial	3	RU	UP
23.9a	SH	Left	No	1	RU	UP
23.9b	CF	Left	Partial	1	RU	UP
24.0a	MS	Right	No	1	RB	UP
24.0b	SS	Left	No	8	RU	UP
24.6	SH	Left	No	8	RU	CW
24.8	CL	Left	Partial	7	RI	CW
24.9a	NE	Left	Partial	7	RU	CW
24.9b	RW	Left	Partial	1	RI	WT
25.0a	SH	Left	No	2	RU	WT
25.0b	SH	Left	No	7	RU	MB
25.3	SG	Right	No	1	RU	CW
25.5a	CM	Left	No	4	RU	WT
25.5b	CL	Right	Yes	5	RU	CW

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff ledge, CL=cottonwood large/20-30+m, CM=Cottonwood medium/10-20m, HL=hillside, MS=mesquite, NE=nest, RW=rock in water, SG=snag, soft, SH=snag, hard (only main branches), SS=snag, shrub, ST=snag top, WO=willow.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]PN=pond, RB=river bend, RU=run, RI=riffle.
[5]CW=cottonwood grove, GC=golf course, MB=mesquite bosque, UP= upland desert, WT=willow thicket.

Table 18. Bald eagle habitat use at the Box Bar BA, Arizona, 2007.										
River km	PW[1,2]	PH	PP	CL	PK	PD	PV	CO	Total	Percent
21.5	--	65	--	--	--	--	--	--	65	0.7
22.0	13	31	--	--	10	--	--	--	54	0.6
22.2	--	76	--	--	--	--	--	--	76	0.9
22.9	16	--	--	--	--	--	--	--	16	0.2
23.1	585	185	--	46	--	--	--	1	817	9.1
23.9	--	153	--		--	--	--	--	153	1.7
24.0	50	56	--	--	--	--	--	--	106	1.2
24.6	--	--	--	--	5	--	--	--	5	0.1
24.8	3	--	5	--	--	--	--	--	8	0.1
24.9	6,819	101	105	4	--	3	2	--	7,034	78.6
25.0	310	28	73	15	44	--	--	1	471	5.3
25.3	19	--	--	--	--	--	--	--	19	0.2
25.5	125	--	--	--	--	--	--	--	125	1.4
Total	7,940	695	183	65	59	3	2	2	8,949	
Percent	88.7	7.8	2.0	0.7	0.7	<0.1	<0.1	<0.1		

[1]Observation Time (minutes).
[2]PW=perched watching, PH=perched hunting, PP=perched preening, CL=perched close to mate, PK=perched with prey, PD=Perched drying, PV=perched vocalizing, CO=Copulation.

APPENDIX F: CANYON DE CHELLY BREEDING AREA SUMMARY

Table 19. Observed human activity and bald eagle behavior, Canyon de Chelly BA, AZ, 2007.

Human Activity	None	Watched	Left Area	Total	Percent
Fishermen	403	4	--	407	66.5
Picnickers	61	3	--	64	10.5
Campers	46	2	--	48	7.8
Drivers	35	1	1	37	6.0
Boaters	21	--	--	21	3.4
Gunfire	10	2	--	12	2.0
Agency workers	11	--	--	11	1.8
Woodcutters	4	--	--	4	0.7
OHVs	3	--	--	3	0.5
Horseback riders	1	--	1	2	0.3
Joggers	--	1	--	1	0.2
Ranchers	--	1	--	1	0.2
Hikers	1	--	--	1	0.2
Total	596	14	2	612	

Table 20. Observed forage events and success, Canyon de Chelly BA, Arizona, 2007.

Sex	Fish		Birds		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	36	26-10	2	1-1	1	1-0	4	4-0	43	32-11
Female	14	11-3	--	--	--	--	2	2-0	16	13-3
Total	50	37-13	2	1-1	1	1-0	6	6-0	59	45-14

[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, Canyon de Chelly BA, Arizona, 2007.

Sex	Fish	Birds	Mammals	Unknown	Total	Percent
Male	76	5	1	7	89	78.8
Female	17	--	--	7	24	21.2
Total	93	5	1	14	113	
Percent	82.3	4.4	0.9	12.4		

Table 22. Observed prey species delivered to the nest, Canyon de Chelly BA, Arizona 2007.

Sex	Fish				Birds			Total	Percent
	TR[1]	CC	GF	BG	WS	RD	CR		
Male	41	11	7	3	3	1	1	67	82.7
Female	11	2	1	0	0	0	0	14	17.3
Total	52	13	8	3	3	1	1	81	
Percent	64.2	16.0	9.9	3.7	3.7	1.2	1.2		

[1]TR=trout spp., CC=channel catfish, GF=goldfish, BG=bluegill, WS=waterfowl spp., RD=ruddy duck, CR=common raven.

Table 23. Bald eagle habitat analysis at the Canyon de Chelly BA, Arizona, 2007.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
2.4	PO	Left	No	7	IF	--
2.7	SG	Left	Partial	7	IF	--
2.8	SG	Left	No	7	IF	--
2.9	SG	Left	Partial	7	IF	--
3.0 (nest)	SG	Left	Partial	7	IF	--
3.1	ST	Left	No	7	IF	--
3.2	ST	Left	Partial	7	IF	--
3.3	SC	Left	No	7	IF	--
3.4	PO	Left	Partial	6	IF	--
3.5	SG	Left	No	4	IF	--
3.6	ID	Left	No	1	RS	--
3.7	PO	Left	No	3	IF	--
3.8	PS	Left	No	5	RC	--
4.0	PS	Right	Partial	3	--	CF
4.5	PO	Right	No	1	RS	--
5.2	PO	Right	No	1	RS	--
5.3	FP	Right	No	1	RS	--
5.4	PS	Right	No	1	RS	--
5.5	SJ	Right	Partial	1	RC	--
7.6	PO	Right	No	1	RC	--
7.8	PO	Right	No	1	RC	--

[1]Perch locations identified in 2007 Nestwatch Report.
[2]FP=fence post, ID=island, PO=pine/conifer, old growth/20-20+ m, PS=pine/conifer, 2nd growth/10-20m, SC=snag, conifer, SG=soft snag, SJ=snag, juniper, 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]IF=inflow to reservoir, RC=reservoir cove, RS=reservoir (main body).
[5]CF=coniferous forest.

Table 24. Bald eagle habitat use at the Canyon de Chelly BA, Arizona, 2007.											
Lake Km	PW[1,2]	PP	PH	PV	PR	PI	ES	PD	ET	Total	Percent
2.4	12	--	--	--	--	--	--	--	--	12	0.1
2.7	119	2	--	--	--	--	--	--	--	121	0.8
2.8	1,647	451	--	5	--	--	--	--	14	2,117	14.0
2.9	2,789	1,059	--	164	51	--	--	22	13	4,098	27.1
3.0	2,143	133	118	21	10	4	--	--	13	2,442	16.2
3.1	1,836	381	54	--	99	--	--	--	15	2,385	15.8
3.2	992	277	--	--	--	--	--	--	--	1,269	8.4
3.3	24	--	--	--	--	2	--	--	--	26	0.2
3.4	73	--	--	--	--	--	--	--	--	73	0.5
3.5	--	--	33	--	--	--	--	--	--	33	0.2
3.6	21	55	9	--	--	20	49	--	--	154	1.0
3.7	--	--	--	--	--	4	--	--	--	4	<0.1
3.8	76	--	366	--	--	5	7	--	10	464	3.1
4.0	--	--	9	--	--	--	--	--	4	13	0.1
5.2	--	--	--	--	--	--	16	--	--	16	0.1
5.3	35	14	531	--	--	--	9	--	--	589	3.9
5.4	144	48	286	--	--	98	2	54	--	632	4.2
5.5	97	28	502	--	--	5	17	--	--	649	4.3
7.6	--	--	7	--	--	--	--	--	--	7	<0.1
7.8	--	--	--	--	--	--	3	--	--	3	<0.1
Total	10,008	2,448	1,915	190	160	138	103	76	69	15,107	
Percent	66.2	16.2	12.7	1.3	1.1	0.9	0.7	0.5	0.5		

[1]Observation Time (minutes). Does not include nest activity.
[2]PW=perched watching, PP=perched preening, PH=perched hunting, PV=perched vocalizing, PR=perched roosting, PI=perched interaction, ES=eating on shore, PD=perched drying, ET=eating in tree.

APPENDIX G: CRESCENT BREEDING AREA SUMMARY

Table 25. Observed human activity and bald eagle behavior, Crescent BA, Arizona, 2007.

Human Activity	N[1]	W	R	F	Total	Percent
Shore fishermen	524	3	--	--	527	39.6
Vehicles	295	2	1	--	298	22.4
Boaters	138	4	--	--	142	10.7
Birders	103	--	2	--	105	7.9
Float tubers	87	--	--	--	87	6.5
Agency workers	37	--	3	2	42	3.2
Canoes	37	--	--	--	37	2.8
Picnickers	34	--	--	--	34	2.6
OHVs	16	--	1	--	17	1.3
Campers	13	--	--	--	13	1.0
Horseback riders	5	1	--	1	7	0.5
Photographers	6	--	--	--	6	0.5
Ranchers w/cattle	--	--	6	--	6	0.5
Small planes	1	--	2	--	3	0.2
Hikers	2	--	--	--	2	0.2
Helicopters	--	--	1	1	2	0.2
Bicyclers	1	--	1	--	2	0.2
Dogs	--	--	1	--	1	0.1
Total	1,299	10	18	4	1,331	

[1]Bald eagle behavior, N=none, W=watched, R=restless, F=flushed.

Table 26. Observed forage event and success, Crescent BA, Arizona, 2007.

Sex	Fish		Birds		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	82	68-14	1	1-0	83	69-14
Female	63	58-5	--	--	63	58-5
Total	145	126-19	1	1-0	146	127-19

[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, 2007.

Sex	Fish	Mammals	Total	Percent
Male	68	1	69	54.3
Female	58	--	58	45.7
Total	126	1	127	
Percent	99.2	0.8		

Table 28. Bald eagle habitat analysis at the Crescent BA, Arizona, 2007.				
Perch Location[1]	Perch Type[2]	Shade	Distance to H_2O[3]	Land Type[4]
1	PS	No	1	RC
2	PO	No	3	RC
3	ST	No	3	RC
4	DL	Yes	4	CF
5	PO	Yes	4	CF
6	HS	Yes	5	CF
7	DL	Yes	6	CF
8	PO	No	7	CF
9	SC	No	8	CF
10	ST	No	8	CF
11	ST	No	8	CF

[1]Perch locations identified in 2007 Nestwatch Report.
[2]PS=pine/conifer, 2nd growth; PO=pine/conifer, old growth/20-30m, ST=snag top, DL=deciduous large, 10-20+m, HS=hard snag (only main branches), SC=conifer snag.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RC=reservoir cove, CF=coniferous forest.

Table 29. Bald eagle habitat use at the Crescent BA, Arizona, 2007.											
River km	PW[1,2]	PP	PH	PR	PV	CL	PU	ET	EN	Total	Percent
1	225	--	434	--	--	--	--	--	--	659	2.2
2	815	--	472	89	--	--	--	--	--	1,376	4.7
3	3,684	26	2,041	405	--	--	--	--	--	6,156	20.9
4	3,365	195	171	571	--	--	--	--	--	4,302	14.6
5	4,735	29	--	341	--	--	--	12	--	5,117	17.4
6	5,063	--	--	571	47	110	--	--	751	6,542	22.2
7	458	--	--	252	--	--	154	--	--	864	2.9
8	27	--	--	223	--	--	--	--	--	250	0.8
9	3,583	30	--	265	--	--	--	7	--	3,885	13.2
10	210	--	--	--	--	--	--	--	--	210	0.7
11	60	--	--	--	--	--	--	--	--	60	0.2
Total	22,225	280	3,118	2,717	47	110	154	19	751	29,421	
Percent	75.5	1.0	10.6	9.2	0.2	0.4	0.5	0.1	2.6		

[1]Observation Time (minutes).
[2]PW=perched watching, PP=perched preening, PH=perched hunting, PR=perched roosting, PV=perched vocalizing, CL=perched close to mate, PU=perched unknown, ET=eating in tree, EN=eating in nest.

APPENDIX H: LADDERS BREEDING AREA SUMMARY

Table 30. Observed human activity and bald eagle behavior, Ladders BA, Arizona, 2007.

Human Activity	None	Watched	Restless	Flushed	Total	Percent
Canoe/Kayaks	22	12	2	2	38	55.9
Small planes	10	4	1	--	15	22.1
Helicopters	6	5	--	1	12	17.6
Agency Workers	--	1	1	--	2	2.9
Ranchers	1	--	--	--	1	1.5
Total	39	22	4	3	68	

Table 31. Observed forage event and success, Ladders BA, Arizona, 2007.

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

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

Table 32. Observed prey types delivered to the nest, Ladders BA, Arizona, 2007.

Sex	Fish	Mammals	Birds	Amphibian & Reptile	Unknown	Total	Percent
Male	8	5	2	1	5	21	84.0
Female	2	--	1	--	1	4	16.0
Total	10	5	3	1	6	25	
Percent	40.0	20.0	12.0	4.0	24.0		

Table 33. Bald eagle habitat analysis at the Ladders BA, Arizona, 2007.

Perch Location[1]	Perch Type[2]	Side	Distance to H_2O[3]	H_2O Type[6]	Land Type[5]
161.3	JN	Right	2	RI	CF
161.7	SJ	Right	2	RI	UP
161.8a	CT	Right	1	RU	CF
161.8b	SJ	Right	2	RI	UP
161.8c	JN	Right	5	RI	UP
162.0	JN	Right	2	RU	CF
162.1a	JN	Right	1	RI	UP
162.1b	CF	Right	1	RI	CF
162.1c	SJ	Right	2	RI	UP
162.1d	JN	Right	3	RI	UP
162.2a	SJ	Right	1	RI	CF
162.2b	SJ	Right	4	RB	UP
162.2c	SG	Right	2	RU	CF
162.2d	SG	Right	3	RU	CF
162.4	SJ	Right	2	RU	UP
162.5a	JN	Right	2	RU	UP
162.5b	SG	Right	2	RU	UP
162.6	SJ	Left	8	RU	UP

[1]River kilometer (Hunt et. al. 1992).
[2]JN=juniper, SJ=juniper snag, CT=cliff top, CF=cliff ledge, SG=soft snag, BO=boulder, SO=shore, NE=nest.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RI=riffle, RU=run, RB=river bend, PO=pool.
[5]CF=coniferous forest, UP=desert upland, WT=willow thicket, CL=cliff.

Table 33. continued.

Perch Location[1]	Perch Type[2]	Side	Distance to H_2O[3]	H_2O Type[6]	Land Type[5]
162.7a	JN	Left	3	RU	UP
162.7b	BO	Right	1	RU	UP
162.8a	SO	Right	1	RU	WT
162.8b	JN	Left	2	RU	UP
162.8c	BO	Left	2	RU	UP
162.8d	CT	Left	2	RU	CL
162.8e	BO	Right	3	PO	UP
162.8f	CT	Left	2	RU	CL
162.8g	JN	Left	2	RU	CL
162.8h	JN	Left	3	RU	UP
162.8i	CF	Left	2	RU	CL
162.8j	CF	Left	2	RU	CL
162.9a	SO	Left	1	PO	WT
162.9b	BO	Left	2	RU	UP
162.9c	BO	Right	2	RU	UP
162.9d	CF	Left	2	RU	CL
162.9e	CF	Right	2	RU	CL
162.9f	NE	Right	2	PO	CL
162.9g	JN	Left	3	RU	UP
162.9h	CT	Left	2	RU	CL
162.9i	CT	Right	2	RU	CL
162.9j	SO	Left	1	RU	WT
163.0a	SO	Left	1	RU	WT
163.0b	CF	Left	1	RU	CL
163.0c	CF	Left	2	RU	CL
163.0d	CF	Left	2	RU	CL
163.0e	BO	Left	1	RU	CL
163.0f	CF	Left	2	RU	CL
163.1a	SO	Left	1	RU	WT
163.1b	CF	Left	1	RU	CL
163.2	CT	Left	1	RU	CL
163.3	CF	Left	1	RU	CL
163.4a	CF	Left	1	RU	CL
163.4b	CT	Right	3	RU	CL
163.5a	CT	Right	2	RU	CL
163.5b	CT	Right	3	RU	CL
163.5c	CF	Right	1	RU	CL
163.6a	CT	Right	2	RU	CL
163.6b	CF	Right	2	RU	CL

[1]River kilometer (Hunt et. al. 1992).
[2]JN=juniper, SJ=juniper snag, CT=cliff top, CF=cliff ledge, SG=soft snag, BO=boulder, SO=shore, NE=nest.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RI=riffle, RU=run, RB=river bend, PO=pool.
[5]CF=coniferous forest, UP=desert upland, WT=willow thicket, CL=cliff.

Table 34. Bald eagle habitat use at the Ladders BA, Arizona, 2007.

River km	PW[1,2]	PH	DW	PP	PE	PD	BA	Total	Percent
161.3	20	16	--	--	--	--	--	36	1.3
161.7	63	--	--	9	--	--	--	72	2.6
161.8	5	11	--	--	--	--	--	16	0.6
162.0	--	110	--	--	--	--	--	110	4.0
162.1	104	-	--	--	--	--	--	104	3.7
162.2	202	--	--	7	--	--	--	209	7.5
162.4	2	--	--	--	--	--	--	2	0.1
162.5	55	--	--	--	--	--	--	55	2.0
162.6	1	--	--	--	--	--	--	1	<0.1
162.7	88	--	--	--	--	--	--	88	3.2
162.8	725	81	15	21	--	--	--	842	30.4
162.9	646	20	18	--	28	--	10	722	26.0
163.0	110	--	31	--	--	21	--	162	5.8
163.1	28	20	4	--	--	--	--	52	1.9
163.2	3	54	--	--	--	--	--	57	2.1
163.3	91	42	4	--	--	--	--	137	4.9
163.4	1	13	--	--	--	--	--	14	0.5
163.5	42	15	--	--	--	--	--	57	2.1
163.6	23	15	--	--	--	--	--	38	1.4
Total	2,209	397	72	37	28	21	10	2,774	
Percent	79.6	14.3	2.6	1.3	1.0	0.8	0.4		

[1]Observation Time (minutes).
[2]PW=perched watching, PH=perched hunting, DW=drinking water, PP=perched preening, PE=perched eating, PD=perched drying, BA=bathing.

APPENDIX I: LUNA BREEDING AREA SUMMARY

Table 35. Observed human activity and bald eagle behavior, Luna BA, Arizona, 2007.

Human Activity	None	Watched	Restless	Flushed	Total	Percent
Fishermen	761	--	--	--	761	56.2
Boats	329	--	--	--	329	24.3
Picnickers	107	--	--	--	107	7.9
Birders	43	--	--	--	43	3.2
Float tubes	35	--	--	--	35	2.6
Canoes/Kayaks	21	--	--	--	21	1.5
Hikers	20	--	--	--	20	1.5
Bicyclists	8	--	--	--	8	0.6
Military jets	--	--	4	2	6	0.4
Photographers	6	--	--	--	6	0.4
Gun shots	3	--	1	--	4	0.3
Small planes	--	1	2	--	3	0.2
Helicopters	--	1	2	--	3	0.2
Construction	3	--	--	--	3	0.2
Hunters (looking for shed antlers)	--	--	--	3	3	0.2
ATV/Motorcycles	2	--	--	--	2	0.1
Shooters	--	--	--	1	1	0.1
Total	1,338	2	9	6	1,355	

Table 36. Observed forage event and success, Luna BA, Arizona, 2007.

Sex	Fish		Birds		Mammals		Carrion		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	21	20-1	9	7-2	1	1-0	5	5-0	36	33-3
Female	17	17-0	9	7-2	--	--	5	5-0	31	29-2
Total	38	37-1	18	14-4	1	1-0	10	10-0	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 37. Observed prey types delivered to the nest, Luna BA, Arizona, 2007.

Sex	Fish	Birds	Mammals	Carrion	Total	Percent
Male	19	7	1	4	31	60.8
Female	12	4	--	4	21	39.2
Total	31	11	1	8	51	
Percent	60.8	21.6	2.0	15.7		

Table 38. Observed prey species delivered to the nest, Luna BA, Arizona 2007.

Sex	Fish	Birds			Total	Percent
	RT[1]	AC	CG	GR		
Male	19	6	1	1	27	62.8
Female	12	3	1	--	16	37.2
Total	31	9	2	1	43	
Percent	72.1	20.9	4.7	2.3		

[1]RT=rainbow trout, AC=American coot, CG=Canada goose, GR=grebe.

Table 39. Bald eagle habitat analysis at the Luna BA, Arizona, 2007.					
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	Land Type[4]
0.3	PS	Right	No	1	RS
0.7	SH	Left	No	2	RC
0.9	SH	Left	No	2	RC
1.1	PS	Left	Yes	1	RC
1.7	PS	Left	Yes	1	RC
1.8	PS	Left	Yes	1	RC
2.0	SH	Left	Yes	8	CF
2.1	PO	Left	No	8	CF
2.2	SH	Left	No	8	CF
2.3	PO	Left	Partial	8	CF
2.4	SH	Left	No	8	CF
2.5	PS	Left	No	2	CF
2.6	WF	Left	No	1	RS
2.7	PS	Left	No	2	RS
2.8	SH	Left	Yes	7	CF
3.5	ST	Left	No	2	RC
5.1	FP	Right	No	1	RC

[1]River kilometer (Hunt et. al. 1992).
[2]PS=pine/conifer, 2nd growth/10-20m, SH=hard snag, PO=pine/conifer, old growth/20-30m,WF=wildlife closure sign, ST=snag top, FP=fence post.
[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, RC=reservoir cove, CF=coniferous forest.

Table 40. Bald eagle habitat use at the Luna BA, Arizona, 2007.										
Lake km	PW[1,2]	PR	PH	PP	EN	CL	PU	PV	Total	Percent
0.3	23	--	20	--	--	--	--	--	43	0.1
0.9	253	--	488	--	--	--	--	--	741	1.7
2.0	443	969	53	--	--	240	--	--	1,705	4.0
2.1	2,055	--	263	23	--	318	--	--	2,659	6.3
2.2	2,069	249	--	20	--	--	2	--	2,340	5.5
2.3	517	426	--	--	612	--	140	--	1,695	4.0
2.4	21,574	2,359	102	868	--	--	318	186	25,407	59.8
2.5	53	--	282	--	--	--	--	--	355	0.8
2.6	1,024	--	74	--	--	--	--	--	1,098	2.6
2.7	93	--	536	--	--	--	--	--	629	1.5
2.8	89	--	--	--	--	--	--	--	89	0.2
3.5	2,461	--	931	43	--	--	--	--	3,435	8.1
5.1	2,223	--	66	--	--	--	--	--	2,289	5.4
Total	32,877	4,003	2,815	954	612	558	460	186	42,466	
Percent	77.4	9.4	6.6	2.2	1.4	1.3	1.1	0.4		

[1]Observation Time (minutes).
[2]PW=perched watching, PR=perched roosting, PH=perched hunting, PP=perched preening, EN=eating in nest, CL=perched close to mate, PU=perched unknown, PV=perched vocalizing.

APPENDIX J: NEEDLE ROCK BREEDING AREA SUMMARY

Table 41. Observed human activity and bald eagle behavior, Needle Rock BA, Arizona, 2007.

Human Activity	None	Watched	Flushed	Restless	Total	Percent
OHVs	1079	--	--	--	1079	49.0
Vehicles	512	--	--	--	512	23.3
Gunfire	314	--	--	--	314	14.3
Horseback riders	69	--	--	--	69	3.1
Agency workers	68	--	--	--	68	3.1
Helicopters	45	--	--	--	45	2.0
Hikers	33	--	1	--	34	1.5
Shooters	24	--	--	--	24	1.1
Small planes	22	--	--	--	22	1.0
Campers	15	--	--	--	15	0.7
Canoes	5	1	1	--	7	0.3
Cyclers	5	--	--	--	5	0.2
Researchers	2	--	1	--	3	0.1
Fishermen	2	--	--	1	3	0.1
Hunters	2	--	--	--	2	0.1
Total	2,197	1	3	1	2,202	

Table 42. Observed forage events and success, Needle Rock BA, Arizona, 2007.

Sex	Fish		Birds		Mammals		Carrion		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	24	13-11	0	0-0	3	3-0	2	2-0	29	18-11
Female	41	30-11	1	1-0	1	1-0	0	0-0	43	32-11
Total	65	43-22	1	1-0	4	4-0	2	2-0	72	50-22

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

Table 43. Observed prey types delivered to the nest, Needle Rock BA, Arizona, 2007.

Sex	Fish	Mammals	Birds	Carrion	Total	Percent
Male	11	3	0	2	16	37.2
Female	25	1	1	0	27	62.8
Total	36	4	1	2	43	
Percent	83.7	9.3	2.3	4.7		

Table 44. Bald eagle habitat analysis at the Needle Rock BA, Arizona, 2007.				
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]
25.4	SM	Left	No	2
25.5	DM	Left	No	3
25.6	SM	Left	No	2
25.7a	SM	Left	No	2
25.7b	WO	Left	No	1
25.8a	SM	Left	No	3
25.8b	CL	Left	Partial	1
25.8c	SM	Left	No	2
25.9a	YL	Left	Partial	3
25.9b	YL	Left	Partial	3
25.9c	WO	Left	No	1
26.0a	SM	Left	No	3
26.0b	WO	Left	No	1
26.1a	SM	Left	No	2
26.1b	SO	Right	No	1
26.3	WO	Left	No	1
26.6	WO	Left	No	1
26.8	CM	Left	Partial	2
26.9	WO	Right	No	1
27.0	SM	Left	No	2
27.1	WO	Left	No	1
27.3a	SG	Right	No	1
27.3b	WO	Left	No	1
27.3c	SO	Left	No	1
27.5a	YL	Left	No	2
27.5b	SH	Left	No	4
27.9	WO	Left	No	1
28.1	DM	Left	Partial	2
28.2a	SH	Left	No	1
28.2b	SO	Left	No	1
28.3	DM	Right	No	1
28.5	SH	Right	No	2
29.0	SH	Left	No	1
29.1	SH	Right	No	1
29.5	PT	Right	No	1
30.7	CF	Left	No	1

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

[2] CF=cliff ledge; CL=cottonwood large/20-30+m; CM=cottonwood medium/10-20m; DM=deciduous medium/5-10m; PT=pinnacle top; SG=soft snag; SH=hard snag (only main branches); SM=snag, mesquite; SO=shore; WO=willow; YL= sycamore large/10-20+m.

[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.

Table 45. Bald eagle habitat use at the Needle Rock BA, Arizona, 2007.										
River km	PW[1,2]	PP	CL	ET/ES	PR	DW	PV	PK	Total	Percent
25.4	807	133	28	--	--	--	3	--	971	10.7
25.5	176	93	--	--	38	--	--	--	307	3.4
25.6	670	106	41	--	52	--	--	1	870	9.6
25.7	588	100	87	--	--	--	--	--	775	8.5
25.8	1,157	231	66	8	48	--	3	--	1,513	16.6
25.9	498	162	--	124	--	--	3	5	792	8.7
26.0	22	10	--		--	--	--	--	32	0.4
26.1	78	23	10	11	--	1	--	4	127	1.4
26.3	80	10	--	--	--	--	--	--	90	1.0
26.6	55	5	--	--	--	--	--	--	60	0.7
26.8	776	328	90	--	--	--	1	--	1,195	13.1
27.0	112	4	--	--	--	--	--	--	116	1.3
27.1	148	4	--	--	--	--	5	--	157	1.7
27.3	245	29	--	9	--	10	1	2	296	3.2
27.4	61	31	--	--	--	--	--	--	92	1.0
27.5	23	1	--	--	--	--	--	--	24	0.3
27.9	98	--	--	--	--	--	--	--	98	1.1
28.1	106	25	3	8	--	--	--	1	143	1.6
28.2	622	44	--	5	--	4	--	--	675	7.4
28.3	1	3	--	5	--	3	--	--	12	0.1
28.5	20	--	--	--	--	--	--	--	20	0.2
29.0	127	24	--	--	--	--	--	--	151	1.7
29.1	233	51	--	--	--	--	--	--	284	3.1
29.5	268	35	--	--	--	--	--	--	303	3.3
30.7	5	--	--	--	--	--	--	--	5	0.1
Total	6,976	1,452	325	170	138	18	16	13	9,108	
Percent	76.6	15.9	3.6	1.9	1.5	0.2	0.2	0.1		

[1]Observation Time (minutes).
[2]PW=perched watching; PP=perched preening; CL=perched very close to mate; ET=eating in tree; ES=eating on shore; PR=perched, roosting; DW= drinking; PV=Perched vocalizing; PK=perched with prey.

APPENDIX K: ORME BREEDING AREA SUMMARY

Table 46. Observed human activity and bald eagle behavior, Orme BA, Arizona 2007.

Human Activity	N[1]	W	R	F	U	Total	Percent
Small planes	125	123	2	--	52	302	55.1
Helicopters	13	124	3	4	29	173	31.6
Vehicles	3	9	--	3	1	16	2.9
Fishermen	--	2	--	2	--	4	0.7
Hikers	--	2	--	1	--	3	0.5
Researchers	--	3	--	3	--	6	1.1
Gunfire	10	1	2	1	--	14	2.6
Law enforcement	--	--	--	1	--	1	0.2
Picnickers	--	4	2	--	--	6	1.1
Rafters	--	1	1	--	--	2	0.4
Campers	--	--	1	--	--	1	0.2
Jets	2	4	--	--	--	6	1.1
Water plant alarms	--	3	--	--	--	3	0.5
Kayaks	--	3	--	--	--	3	0.5
Swimmers	--	2	--	--	1	3	0.5
Photographers	--	1	--	--	--	1	0.2
Birders	--	2	--	--	--	2	0.4
Ultralights	--	1	--	--	--	1	0.2
Construction	--	1	--	--	--	1	0.2
Total	153	286	11	15	83	548	

[1]Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, U=unknown.

Table 47. Observed forage events and success, Orme BA, Arizona, 2007.

Sex	Fish		Birds		Mammals		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	8	7-1	1	0-1	2	2-0	11	9-2
Female	10	10-0	1	1-0	--	--	11	11-0
Total	18	17-1	2	1-1	2	2-0	22	20-2

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

Table 48. Observed prey types delivered to the nest, Orme BA, Arizona, 2007.

Sex	Fish	Mammals	Birds	Unknown	Total	Percent
Male	34	2	--	2	38	55.1
Female	27	--	1	3	31	44.9
Total	61	2	1	5	69	
Percent	88.4	2.9	1.4	7.2		

Table 49. Bald eagle habitat analysis at the Orme BA, Arizona, 2007.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
0.2V[6]	MS	Left	Yes	1	RI	MB
0.3aV	SM	Left	No	1	RI	MB
0.3bV	MS	Left	No	1	RI	MB
0.3cV	TX	Left	Yes	1	RI	WT
0.4V	HS	Right	No	6	--	CW
0.5V	HS	Right	No	4	BW	CW
0.6aV	CM	Right	No	2	RU	CW
0.6bV	MS	Left	No	1	RU	MB
0.65aV	CM	Right	No	2	RU	CW
0.65bV	HS	Left	Yes	1	RU	MB
0.75V	HS	Left	No	1	RU	MB
1.0V	MS	Left	No	1	PO	MB
1.5V	SM	Left	No	1	RU	MB
1.8V	HS	Left	No	1	RU	CW
4.5S	CL	Left	No	2	RI	CW
4.9S	MS	Left	No	2	RI	MB
5.0S	CM	Right	No	4	RU	CW
5.1S	CM	Right	No	1	RI	CW
5.2S	CL	Right	No	5	RU	CW
5.3S	CM	Right	No	8	--	CW
5.4S	HS	Right	No	6	--	CW
5.6aS	MS	Left	No	3	RU	MB
5.6bS	SM	Right	No	1	RU	CW
5.7S	HS	Right	No	1	RU	MB
6.5aS	CT	Left	No	3	RU	UP
6.5bS	CL	Right	No	2	RU	CW
10.1S	CL	Right	No	3	RU	CW
14.0S	HS	Left	No	2	RI	CW

[1]River kilometer (Hunt et. al. 1992).
[2]MS=mesquite, SM=mesquite snag, TX=tamarix, HS=hard snag, CM=cottonwood medium/10-20m, CL=cottonwood large/20-30+m, CT=cliff top.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4] BW=backwater; PO=pool; RI=riffle; RU=run.
[5] CW=cottonwood grove; UP=desert upland; MB=mesquite bosque; WT=willow thicket.
[6]V=Verde River, S=Salt River.

Table 50. Bald eagle habitat use at the Orme BA, Arizona, 2007.

River km	PW[1,2]	PH	PP	PD	PK	ET	SS	SW	DW	Total	Percent
0.2V[3]	--	796	21	--	2	--	--	--	--	819	3.1
0.3V	--	1,866	--	--	23	33	25	55	1	2003	7.5
0.4V	15,330	62	866	276	139	133	--	--	--	16,806	62.7
0.5V	--	28	--	--	--	--	--	7	1	36	0.1
0.6V	--	850	4	15	--	--	--	--	--	869	3.2
0.65V	--	1,576	12	--	--	--	--	--	--	1,588	5.9
0.75V	--	10	--	--	--	--	--	--	--	10	<0.1
1.0V	--	252	--	--	--	--	--	--	--	252	0.9
1.5V	--	100	--	--	--	--	--	--	--	100	0.4
1.8V	--	14	--	--	--	--	--	--	--	14	0.1
4.5S	--	69	--	--	--	--	--	--	--	69	0.3
4.9S	--	476	--	--	--	--	--	--	--	476	1.8
5.0S	--	553	5	--	--	25	--	--	--	583	2.2
5.1S	--	543	--	--	7	12	--	--	--	562	2.1
5.2S	79	20	--	--	--	--	--	--	--	99	0.4
5.3S	82	321	37	--	--	--	--	--	--	440	1.6
5.4S	--	25	--	--	--	--	--	--	--	25	0.1
5.6S	--	15	--	--	--	--	--	--	--	15	0.1
5.7S	--	27	--	--	--	--	--	--	--	27	0.1
6.5S	--	74	--	--	--	--	--	--	--	74	0.3
10.1S	--	42	--	--	--	--	--	--	--	42	0.2
14.0S	--	1,916	--	--	--	--	--	--	--	1,916	7.1
Total	15,491	9,635	945	291	171	203	25	62	2	26,825	
Percent	57.7	35.9	3.5	1.1	0.6	0.8	0.1	0.2	<0.1		

[1]Observation Time (minutes).

[2]PW=perched watching; PH=perched hunting; PP=perched preening; PD=perched drying; PK=perched with prey; ET=eating in tree; SS=standing on shore; SW=soaring over water; DW=drinking.

[3]V=Verde River, S=Salt River.

APPENDIX L: PINTO BREEDING AREA SUMMARY

Table 51. Observed human activity and bald eagle behavior, Pinto BA, Arizona, 2007.					
Human Activity	None	Watched	Flushed	Total	Percent
Hunters	--	--	2	2	50.0
Jets	1	--	--	1	25.0
Helicopters	--	1	--	1	25.0
Total	1	1	2	4	

Table 52. Observed forage events and success, Pinto BA, Arizona, 2007.												
Sex	Fish		Birds		Mammals		Amphibian & Reptile		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U	E	S-U
Male	8	7-1	5	2-3	1	1-0	2	2-0	7	4-3	23	16-7
Female	2	2-0	--	--	1	1-0	1	1-0	--	--	4	4-0
Total	10	9-1	5	2-3	2	2-0	3	3-0	7	4-3	27	20-7

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

Table 53. Observed prey types delivered to the nest, Pinto BA, Arizona, 2007.							
Sex	Fish	Amphibian &Reptile	Birds	Mammals	Unknown	Total	Percent
Male	7	2	2	1	5	17	77.3
Female	2	1	--	1	1	5	22.7
Total	9	3	2	2	6	22	
Percent	40.9	13.6	9.1	9.1	27.3		

Table 54. Observed prey species delivered to the nest, Pinto BA, Arizona 2007.						
Sex	Fish			Birds	Total	Percent
	CS[1]	SB	BC	AC		
Male	1	1	1	1	4	100
Total	1	1	1	1	4	
Percent	25.0	25.0	25.0	25.0		

[1]CS=catfish spp., SB=smallmouth bass, BC=black crappie, AC=American coot.

Table 55. Bald eagle habitat analysis at the Pinto BA, Arizona, 2007.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
102.2a	HS	Left	No	4	RU	TX
102.2b	HS	Left	Partial	3	RU	TX
102.3a	HS	Left	No	4	RU	TX
102.3b	HS	Left	No	4	RU	TX
102.5	CT	Left	Yes	1	RU	CL
102.6	CT	Right	No	1	RB	CL
102.7	CF	Right	No	1	RU	CL
102.8	CT	Right	Yes	1	RU	CL
102.9a	CS	Right	No	1	RU	TX
102.9b	CT	Right	No	1	RU	CL
103.0	CT	Right	No	1	RU	CL
103.1	CT	Right	No	1	RU	CL
103.2a	CT	Right	No	1	RU	CL
103.2b	SH	Left	Yes	4	RU	TX
104.3a	CM	Right	No	1	RU	CW
104.3b	CM	Right	No	1	RI	CW
104.3c	CL	Right	No	1	--	CW
104.8	CM	Right	No	2	--	TX
105.7	CL	Left	No	1	RU	--

[1]River kilometer (Hunt et. al. 1992).
[2]HS=hard snag, CT=cliff top, CF=cliff ledge, CS=cottonwood small/0-10m, SH=shrub, CM=cottonwood medium/10-20m, CL=cottonwood large/20-30+.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run, RB=river bend, RI=riffle.
[5]TX=tamarisk thicket, CL=cliff, CW=cottonwood grove.

Table 56. Bald eagle habitat use at the Pinto BA, Arizona, 2007.										
River km	PW[1,2]	PH	PP	PD	PE	PK	PU	SS	Total	Percent
102.2	332	--	71	44	12	36	--	--	495	19.1
102.3	670	46	62	15	31	--	47	--	871	33.6
102.5	1	56	--	--	--	--	--	--	57	2.2
102.6	79	556	51	31	--	11	--	--	728	28.0
102.4	15	33	--	--	--	--	--	2	50	1.9
102.8	8	71	--	--	--	--	--	--	79	3.0
102.9	--	23	--	--	--	--	--	--	23	0.9
103.0	--	40	--	--	--	9	--	--	49	1.9
103.1	7	12	--	--	--	--	--	--	19	0.7
103.2	62	6	5	--	15	--	--	15	103	4.0
104.3	57	--	--	--	--	--	--	--	57	2.2
104.8	48	--	--	--	--	--	--	--	48	1.8
105.7	13	4	--	--	--	--	--	--	17	0.7
Total	1,292	847	189	90	58	56	47	17	2,596	
Percent	49.8	32.6	7.3	3.5	2.2	2.2	1.8	0.7		

[1]Observation Time (minutes).
[2]PW=perched watching, PH=perched hunting, PP=perched preening, PD=perched drying, PE=perched eating, PK=perched with prey, PU=perched unknown, SS=standing on shore.

APPENDIX M: PLEASANT BREEDING AREA SUMMARY

Table 57. Observed human activity and bald eagle behavior, Lake Pleasant BA, Arizona, 2007.

Human Activity	N[1]	W	F	B	Total	Percent
Small plane	41	31	--	3	75	42.6
Boat	29	7	1	4	41	23.3
Helicopter	14	13	--	1	28	15.9
Agency Worker	5	4	1	--	10	5.7
Jet ski	3	2	--	1	6	3.4
Ultralight	1	3	1	--	5	2.8
Kayak/Canoe	3	1	--	--	4	2.3
Waterskier	1	--	--	2	3	1.7
Jet	--	2	--	--	2	1.1
OHV	2	--	--	--	2	1.1
Total	99	63	3	11	176	

[1]Bald eagle behavior, N=none, W=watched, F=flushed, B=birds not in area.

Table 58. Observed forage events and success, Lake Pleasant BA, Arizona, 2007.

Sex	Fish		Birds		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	3	2-1	--	--	3	2-1
Female	4	3-1	--	--	4	3-1
Both	--	--	1	0-1	1	0-1
Unknown	3	2-1	--	--	3	2-1
Total	10	7-3	1	0-1	11	7-4

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

Table 59. Observed prey types delivered to the nest, Lake Pleasant BA, Arizona, 2007.

Sex	Fish	Birds	Unknown	Total	Percent
Male	13	5	7	25	52.1
Female	10	1	5	16	33.3
Unknown	4	1	2	7	14.6
Total	27	7	14	48	
Percent	56.3	14.6	29.2		

Table 60. Observed prey species delivered to the nest, Lake Pleasant BA, Arizona 2007.

Sex	Fish					Birds	Total	Percent
	CP[1]	LB	SB	CC	CR	AC		
Unknown	2	1	1	1	1	3	9	100
Total	2	1	1	1	1	3	9	
Percent	22.2	11.1	11.1	11.1	11.1	33.3		

[1] CP=carp; LB=largemouth bass; SB=smallmouth bass; CC=channel catfish; CR=crappie; AC=American coot

Table 61. Bald eagle habitat analysis at the Lake Pleasant BA, Arizona, 2007.				
Perch Location[1]	Perch Type[2]	Side	Distance to H_2O[3]	H_2O Type[4]
71.8	CF	Left	3	BW
72.5	LG	Left	1	RB
72.6	CT	Left	1	RB
72.8	CF	Left	8	RB
72.9a	SS	Left	1	RB
72.9b	RW	Left	1	RB
72.9c	SO	Left	1	RB
73.0	CF	Left	1	RB
73.1a	CF	Left	4	RB
73.1b	SO	Left	1	RC
73.2a	CF	Left	2	RB
73.2b	CT	Left	4	RB
73.2c	BO	Left	1	RB
73.3a	NE	Left	1	RB
73.3b	CT	Left	4	RB
73.3c	RW	Left	1	RB
73.3d	CF	Left	2	RB
73.3e	BO	Left	1	RB
73.4	CF	Left	3	RB
73.5a	CF	Right	1	RB
73.5b	CT	Left	1	RB
73.6	CF	Left	2	RB

[1]River kilometer (Hunt et. al. 1992).
[2] BO=boulder; CF=cliff face; CT=cliff top; LG=log; NE=nest; SS=snag,shrub; SO=shore; RW=rock in water.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]BW=backwater; RB=river bend; RC=reservoir cove.

Table 62. Bald eagle habitat use at the Pleasant BA, Arizona, 2007.										
River km	PW[1,2]	PH	DW	SS	PP	SW	BA	EC	Total	Percent
71.8	36	--	--	--	--	--	--	--	36	0.5
72.3	--	--	--	3	--	--	--	--	3	<0.1
72.4	5	--	--	2	--	4	--	--	11	0.1
72.5	22	--	--	5	--	--	10	--	37	0.5
72.6	7	--	--	1	--	--	--	--	8	0.1
72.8	13	--	8	--	--	4	--	--	25	0.3
72.9	10	--	--	15	--	--	--	--	25	0.3
73.0	--	--	14	13	25	10	6	6	74	1.0
73.1	503	6	18	8	6	11	--	--	552	7.5
73.2	5,329	161	4	--	12	4	--	5	5,515	74.7
73.3	156	191	19	11	11	--	--	--	388	5.3
73.4	442	--	3	--	--	--	--	--	445	6.0
73.5	80	--	--	--	--	--	--	--	80	1.1
73.6	182	--	--	--	--	--	--	--	182	2.5
Total	6,785	358	66	58	54	33	16	11	7,381	
Percent	91.9	4.9	0.9	0.8	0.7	0.4	0.2	0.1		

[1]Observation Time (minutes).
[2]PW=perched watching; PH=perched hunting; DW=drinking water; SS=standing on shore; PP=perched preening; SW=soaring over water; BA=bathing; EC=eating on cliff.

APPENDIX N: SAN CARLOS BREEDING AREA SUMMARY

Table 63. Observed human activity and bald eagle behavior, San Carlos BA, Arizona, 2007.

Human Activity	N[1]	W	R	F	L	Total	Percent
Train	31	21	--	--	--	52	55.9
Hiker	13	2	--	1	--	16	17.2
Woodcutter	4	1	1	--	1	7	7.5
Shooter	6	--	--	--	--	6	6.5
Researcher	2	2	--	--	--	4	4.3
Helicopter	--	1	--	1	1	3	3.2
Small plane	3	--	--	--	--	3	3.2
Construction	--	1	--	--	--	1	1.1
Cattle	1	--	--	--	--	1	1.1
Total	60	28	1	2	2	93	

[1]Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left area.

Table 64. Observed forage events and success, San Carlos BA, Arizona, 2007.

Sex	Mammals		Total	
	E[1]	S-U[2]	E	S-U
Male	2	2-0	2	2-0
Total	2	2-0	2	2-0

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

Table 65. Observed prey types delivered to the nest, San Carlos BA, Arizona, 2007.

Sex	Fish	Birds	Mammals	Unknown	Total	Percent
Male	16	9	3	21	49	62.8
Female	23	3	--	3	29	37.2
Total	39	12	3	24	78	
Percent	50.0	15.4	3.8	30.8		

Table 66. Observed prey species delivered to the nest, San Carlos BA, Arizona, 2007.

Sex	Fish		Birds	Mammals		Total	Percent
	CP[1]	BC	AC	RS	GO		
Male	1	2	4	1	1	9	69.2
Female	1	2	1	--	--	4	30.8
Total	2	4	5	1	1	13	
Percent	15.4	30.8	38.4	7.7	7.7		

[1]CP=carp; BC=black crappie; AC=American coot; RS=rabbit species; GO=gopher species.

Table 67. Bald eagle habitat analysis at the San Carlos BA, Arizona, 2007.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
10.5	SH	Right	N	2	RU	TX
10.6a	WO	Left	N	1	RU	WT
10.6b	SO	Right	N	1	RI	WT
10.6c	SH	Right	N	2	RU	MB
10.7	MS	Right	N	1	--	PN
10.8a	SH	Right	N	1	RU	CW
10.8b	SH	Right	N	2	RU	CW
10.8c	SH	Right	N	4	RU	CW
10.9a	SH	Right	N	2	RU	CW
10.9b	SH	Right	N	1	RU	CW
10.9c	SG	Right	N	1	RU	CW
10.9d	SG	Right	N	2	RU	CW
10.9e	CL	Right	N	2	RU	CW
11.0	SH	Right	N	1	RU	CW
11.1	CS	Left	P	4	RU	CW

[1]River kilometer (Hunt et. al. 1992).
[2]SH=hard snag (only main branches); WO=willow; SO=shore; MS=mesquite; SG=soft snag; CL=cottonwood large/20-30+m; CS= cottonwood small/0-10m.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run; RI=riffle.
[5]CW=cottonwood grove; MB=mesquite bosque; PN=pond; TX=tamarisk thicket; WT=willow thicket.

Table 68. Bald eagle habitat use at the San Carlos BA, Arizona, 2007.

River km	PW[1,2]	EN	PH	CL	PP	DW	PV	Total	Percent
10.5	64	--	--	--	--	--	--	64	0.8
10.6	253	--	20	--	--	7	--	280	3.7
10.7	67	--	29	--	--	--	--	96	1.3
10.8	4,274	--	61	63	37	--	5	4,440	58.7
10.9	2,488	166	--	8	--	--	2	2,664	35.2
11.0	17	--	--	--	--	--	--	17	0.2
Total	7,163	166	110	71	37	7	7	7,561	
Percent	94.7	2.2	1.5	0.9	0.5	0.1	0.1		

[1]Observation Time (minutes).
[2]PW=perched watching; EN=eating in nest; PH=perched hunting; CL=perched close to mate; PP=perched preening; DW=drinking; PV=perched vocalizing.

APPENDIX O: TONTO BREEDING AREA SUMMARY

Table 69. Observed human activity and bald eagle behavior, Tonto BA, Arizona, 2007.

Human Activity	N[1]	W	R	F	L	U	Total	Percent
Hiker	12	1	--	--	--	--	13	26.0
Helicopter	3	7	--	--	1	1	12	24.0
Small plane	6	1	1	--	--	1	9	18.0
Researcher	2	--	--	2	--	--	4	8.0
Birder	2	--	--	--	--	--	2	4.0
Agency worker	2	--	--	--	--	--	2	4.0
Military plane	1	--	--	--	--	1	2	4.0
OHV & dirt bike	--	2	--	--	--	--	2	4.0
Horseback rider	--	1	--	--	--	--	1	2.0
Gunfire	1	--	--	--	--	--	1	2.0
Small balloon	--	1	--	--	--	--	1	2.0
Motor parachute	--	1	--	--	--	--	1	2.0
Total	29	14	1	2	1	3	50	

[1]Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left the area, U=unknown.

Table 70. Observed forage events and success, Tonto BA, Arizona, 2007.

Sex	Fish		Birds		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	3	2-1	3	2-1	--	--	3	0-3	9	4-5
Female	7	7-0	1	0-1	1	1-0	3	0-3	12	8-4
Tandem	1	0-1	1	0-1	--	--	--	--	2	0-2
Unknown	1	1-0	1	0-1	1	1-0	2	2-0	5	4-1
Total	12	10-2	6	2-4	2	2-0	8	2-6	28	16-12

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

Table 71. Observed prey typed delivered to the nest, Tonto BA, Arizona, 2007.

Sex	Fish	Birds	Mammals	Unknown	Total	Percent
Male	22	1	2	3	28	35.9
Female	36	1	1	2	40	51.3
Unknown	6	--	1	3	10	12.8
Total	64	2	4	8	78	
Percent	82.1	2.6	5.1	10.3		

Table 72. Observed prey species delivered to the nest, Tonto BA, Arizona 2007.

Sex	Fish							Birds	Mammals		Total	Percent
	BC[1]	LB	SB	CP	CC	SU	FC	AC	JK	DC		
Male	8	4	1	--	2	--	1	1	--	1	18	47.4
Female	5	3	3	4	1	1	--	1	1	--	19	50.0
Unknown	1	--	--	--	--	--	--	--	--	--	1	2.6
Total	14	7	4	4	3	1	1	2	1	1	38	
Percent	36.8	18.4	10.5	10.5	7.9	2.6	2.6	5.3	2.6	2.6		

[1]BC=black crappie, LB=largemouth bass, SB=smallmouth bass, CP=carp, CC=channel catfish, SU=sucker, FC=flathead catfish, AC=American coot, JK=black-tailed jackrabbit, DC=desert cottontail.

Table 73. Bald eagle habitat analysis at the Tonto BA, Arizona, 2007.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
10.0	CT	Left	No	7	RC	UP
14.0	CT	Right	Partial	7	RS	UP
15.4	LG	Right	No	1	PO	WT
15.6	WO	Left	No	1	RU	CW
16.4a	DM	Left	No	1	RU	TX
16.4b	SH	Right	No	4	RI	CW
16.9a	SO	Left	No	1	RI	CW
16.9b	CM	Left	Yes	5	RI	CW
16.9c	SG	Left	No	5	RI	CW
17.1	SG	Left	No	5	IF	CW
18.0	SG	Left	Partial	5	RU	MB

[1]River kilometer (Hunt et. al. 1992).
[2] CM=cottonwood medium/10-20m; CT=cliff top; DM=deciduous medium/5-10m; LG=log; SG=soft snag; SH=hard snag (only main branches); SO=shore; WO=willow.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]IF=inflow to reservoir, PO=river pool, RC=reservoir cove, RS=reservoir, RU=run, RI=riffle.
[5]CW=cottonwood grove, MB=mesquite bosque, UP=desert upland, TX=tamarisk thicket, WT=willow thicket.

Table 74. Bald eagle habitat use at the Tonto BA, Arizona, 2007.												
River km	PW[1,2]	PP	PD	PH	DW	PR	PV	BA	EX	X	Total	Percent
10.0-10.9	--	--	--	23	--	--	--	--	--	--	23	0.2
15.0-15.9	--	--	--	28	--	--	--	--	--	--	28	0.2
16.0-16.9	9,922	488	405	85	206	161	52	45	36	33	11,433	96.9
17.0-17.9	90	--	--	196	--	--	--	--	--	--	286	2.4
18.0-18.9	--	--	--	29	--	--	--	--	--	--	29	0.2
Total	10,012	488	405	361	206	161	52	45	36	33	11,799	
Percent	84.9	4.1	3.4	3.1	1.7	1.4	0.4	0.4	0.3	0.3		

[1]Observation Time (minutes).
[2] PW=perched watching, PP=perched preening, PD=perched drying, PH=perched hunting, DW=drinking, PR=perched roosting, PV=perched vocalizing, BA=bathing, EX=eating on shore or in tree, X=other (includes gathering nest material and perched with prey).

APPENDIX P: TOWER BREEDING AREA SUMMARY

Table 75. Observed human activity and bald eagle behavior, Tower BA, Arizona, 2007.

Human Activity	N[1]	W	R	F	B	U	Total	Percent
Train	24	56	3	7	6	13	109	41.4
Road-rail vehicle	6	15	--	--	2	15	38	14.4
Small plane	5	4	--	--	2	24	35	13.3
Driver	19	--	--	--	3	1	23	8.7
Cattle	9	2	2	--	--	5	18	6.8
Helicopter	--	1	--	--	1	8	10	3.8
Researcher[2]	--	5	2	--	--	--	7	2.7
Canoe/kayak	2	3	--	--	--	--	5	1.9
OHV	2	--	--	--	--	3	5	1.9
Agency worker[2]	3	--	--	--	--	--	3	1.1
Fisherman	3	--	--	--	--	--	3	1.1
Miner	--	--	--	--	--	2	2	0.8
Gunshots	--	2	--	--	--	--	2	0.8
Horseback rider	--	--	--	--	--	1	1	0.4
Birder	1	--	--	--	--	--	1	0.4
Camper	1	--	--	--	--	--	1	0.4
Total	75	88	7	7	14	72	263	

[1]Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, B=birds not in area, U=unknown.
[2]Researcher=AZGFD personnel, Agency worker=USGS personnel.

Table 76. Observed forage events and success, Tower BA, Arizona, 2007.

Sex	Fish		Total	
	E[1]	S-U[2]	E	S-U
Male	7	5-2	7	5-2
Female	4	2-2	4	2-2
Total	11	7-4	11	7-4

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

Table 77. Observed prey types delivered to the nest, Tower BA, Arizona, 2007.

Sex	Fish	Mammals	Unknown	Total	Percent
Male	20	1	11	32	45.1
Female	11	4	15	30	42.2
Unknown	1	--	8	9	12.7
Total	32	5	34	71	
Percent	45.1	7.0	47.9		

Table 78. Observed prey species delivered to the nest, Tower BA, Arizona, 2007.

Sex	Fish		Mammals	Total	Percent
	CS[1]	SU	RS		
Male	1	1	1	3	42.9
Female	--	--	4	4	57.1
Total	1	1	5	7	
Percent	14.3	14.3	71.4		

[1]CS=catfish species, SU=sucker species, RS=rabbit species.

Table 79. Bald eagle habitat analysis at the Tower BA, Arizona, 2007.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
247.1	SJ	Right	No	1	RI	CL
247.2a	EP	Left	No	2	RI	CL
247.2b	SJ	Right	No	2	PO	CL
247.3a	CF	Left/Right	No	1	PO	CL
247.3b	CT	Left	No	1	PO	CL
247.3c	SJ	Right	No	2	PO	CL
247.4a	CF	Left	No	1	PO	CL
247.4b	CT	Left/Right	No	1	PO	CL
247.5a	CT	Right	Yes	1	PO	CL
247.5b	SJ	Right	No	1	PO	CL
247.6	SJ	Right	No	1	PO	CL
247.7a	CF	Right	Yes	1	PO	CL
247.7b	CT, SJ	Right	No	1	PO	CL
247.7c	GR	Left	Partial	1	PO	MB
247.7d	GR	Right	No	2	PO	UP
247.8a	CF	Right	Yes	1	RI	CL
247.8b	CF, CT	Left	No	1	RI	CL
247.8c	GR	Right	Yes	2	PO	UP
247.9a	CF	Left	Yes	1	RI	CL
247.9b	SJ	Right	Partial	1	RI	CL
247.9c	CT	Left/Right	No	1	RI	CL
247.9d	SO	Right	No	1	PO	--
248.0a	BO	Right	Partial	1	PO	--
248.0b	CF	Left	Partial	1	PO	CL
248.0c	GR	Left	Partial	1	PO	MB
248.0d	GR, TR	Right	No	2	PO	UP
248.0e	CT	Left/Right	No	1	PO	CL
248.0f	SJ	Right	No	1	PO	CL
248.0g	SJ	Right	Partial	1	PO	MB
248.0h	SO	Left	No	1	PO	--
248.1a	CF	Left	Partial	1	PO	CL
248.1b	CT	Left	No	1	PO	CL
248.1c	GR	Left	No	1	PO	MB
248.1d	SJ	Right	Partial	1	PO	CL
248.1e	JN, SP	Right	No	1	PO	CL
248.2a	CF	Left	Yes	1	PO	CL
248.2b	CT	Left	No	1	PO	CL
248.2c	DM	Right	No	1	PO	WT
248.2d	JN, SP	Right	No	1	PO	CL
248.2e	SO	Right	Yes	1	PO	CL
248.3a	CF	Right	Yes	1	PO	CL
248.3b	JN, ST	Right	No	1	PO	CL
248.3c	CF, CT	Left	No	1	PO	CL
248.3d	BO	Left	No	1	PO	MB
248.3e	SO	Left	Yes	1	RI	WT

[1]River kilometer (Hunt et. al. 1992).
[2]BO=boulder, CF=cliff ledge, CT=cliff top, DM=deciduous medium/5-10m, EP=power line pole, GR=ground, JN=juniper (live), SJ=snag, juniper, SO=shore, SP=stump or fallen tree, ST=snag top, TP=telephone pole TR=train tracks.
[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] PO=river pool, RI=riffle, RU=run.
[5] CL=cliffs, MB=mesquite bosque, UP=desert upland, WT=willow thicket.

Table 79. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
248.4a	CF	Left	Yes	1	RU	CL
248.4b	CF, CT, GR	Right	No	1	RU	CL
248.4c	SO	Right	Yes	1	RU	WT
248.5a	CF, CT	Right	No/Yes	1	RI	CL
248.5b	CF	Left	Partial	1	RI	CL
248.5c	TP	Right	No	2	RI	UP
248.5d	JN	Right	No	1	RI	CL
248.5e	BO	Right	Yes	1	RI	MB
248.6	DM	Right	No	1	RU	WT
248.8	CT	Left	No	1	PO	CL
249.1	SJ	Left	No	1	PO	CL
250.1	SJ	Right	No	2	RI	UP
250.8	BO	Right	No	2	PO	UP
251.5	SJ	Right	No	2	PO	UP

[1]River kilometer (Hunt et. al. 1992).
[2]BO=boulder, CF=cliff ledge, CT=cliff top, DM=deciduous medium/5-10m, EP=power line pole, GR=ground, JN=juniper (live), SJ=snag, juniper, SO=shore, SP=stump or fallen tree, ST=snag top, TP=telephone pole TR=train tracks.
[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] PO=river pool, RI=riffle, RU=run.
[5] CL=cliffs, MB=mesquite bosque, UP=desert upland, WT=willow thicket.

Table 80. Bald eagle habitat use at the Tower BA, Arizona, 2007.

River km	PW[1, 2]	PH	PU	PK	PD	PP	PV	DW	EX	Total	Percent
247.0	-	33	-	-	-	-	-	-	-	33	0.5
247.1	-	19	-	-	-	-	-	-	-	19	0.3
247.2	-	741	246	-	-	13	-	-	-	1,000	15.8
247.3	-	16	33	-	-	-	-	-	-	49	0.8
247.4	83	80	46	17	-	-	-	-	-	226	3.6
247.5	4	59	49	-	-	-	-	-	-	112	1.8
247.6	33	-	66	-	-	-	-	-	-	99	1.6
247.7	273	22	90	9	-	-	-	-	-	394	6.2
247.8	344	27	-	-	23	-	-	-	29	423	6.7
247.9	22	99	123	-	-	-	-	2	-	246	3.9
248.0	325	122	235	10	-	-	2	16	4	714	11.3
248.1	1,470	3	154	-	-	6	1			1,634	25.8
248.2	51	164	-	-	-	-	-	-	-	215	3.4
248.3	73	57	35	4	-	-	-	-	-	169	2.7
248.4	206	78	3	-	-	-	-	-	-	287	4.5
248.5	260	163	-	3	-	-	236	-	-	662	10.4
248.6	-	6	-	-	-	-	-	-	-	6	0.1
248.8	40	-	-	-	-	-	-	-	-	40	0.6
249.1	4	-	-	-	-	-	-	-	-	4	0.1
250.8	-	-	1	-	-	-	-	-	-	1	<0.1
251.1	-	-	1	-	-	-	-	-	-	1	<0.1
251.5	-	-	11	-	-	-	-	-	-	11	0.2
Total	3,188	1,689	1,093	43	23	19	239	18	33	6,345	
Percent	50.2	26.6	17.2	0.7	0.4	0.3	3.8	0.3	0.6		

[1]Observation Time (minutes).
[2] PW=perched watching, PH=perched hunting, PU=perched unknown, PK=perched with prey, PD=perched drying, PP=perched preening, PV=perched vocalizing, DW=drinking, EX=eating on cliff or ground.