ARIZONA BALD EAGLE MANAGEMENT PROGRAM
2005 SUMMARY REPORT

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This report, in part, summarizes the results of monitoring by the Arizona Bald Eagle Nestwatch Program using the breeding area (BA) reports submitted in 2005. Those include: Laura Riley and Andrew Pyle, Box Bar BA; Suzzane Ehret and Robert Klotz, Coolidge/Pinto BA; Joe Peddie and Marta Peddie, Luna/Crescent/Lower Lake Mary BA; Lou Elliot and Keith Karoglanian, Needle Rock BA; Jeanne Parker and Chris White, Orme/Granite Reef BA; Erin Brandt and Scott Olmstead, Lake Pleasant/Ladders BA; Marc Chipault and Jennifer Glazer San Carlos BA; Melanie Pincus and Ethan Kelley Tonto BA; Ernie O'Toole and Bill Trione Tower BA.

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ARIZONA BALD EAGLE MANAGEMENT PROGRAM 2005 SUMMARY REPORT

Kenneth V. Jacobson, Jorge S. Canaca, James T. Driscoll

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 (USFWS 1995), and has proposed to delist in the future (USFWS 1999). Until delisting, the bald eagle remains protected under the Endangered Species Act. Thereafter, the Air Borne Hunting Act, Bald and Golden Eagle Protection Act, Lacy Act, Migratory Bird Treaty Act, and Arizona Revised Statute Title 17 will protect the species.

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. The members include: Arizona Game and Fish Department (AGFD), Arizona Public Service (APS), Arizona State Parks Department, Army Corps of Engineers, Fort McDowell Yavapai Nation, Geo-Marine (U.S. Air Combat Command), Maricopa County Parks and Recreation Department (MCPRD), 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.

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

STUDY AREA

Statewide monitoring and surveys were conducted within 5 biotic communities (Brown 1994): Great Basin Conifer Woodland, Interior Chaparral, Plains and Great Basin Grasslands, Rocky Mountain (Petran) and Madrean Montane Conifer Forest, and Sonoran Desertscrub-Arizona Upland Subdivision. Other biotic communities visited include Chihuahuan Desertscrub, Mohave Desertscrub, Sonoran Riparian Deciduous Forest and Woodlands, and Sonoran Desert-Lower Colorado Subdivision.

Most Arizona bald eagle breeding areas (BAs) are in central Arizona between elevations of 329 m (1080 ft) and below 1341 m (4400 ft). They are found within the riparian areas of the Sonoran Riparian Scrubland and Sonoran Interior Strands as described in Brown (1994) (Fig. 1). Representative riparian vegetation includes Fremont cottonwood (*Populus fremonti*), Goodding willow (*Salix goodding*), Arizona sycamore (*Platamus wrightii*), and introduced 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 (*Prosopsis* spp.), ironwood (*Olyneya tesota*), saguaro (*Carnegiea gigantea*), teddy bear cholla (*Opuntia bigelovii*),

juniper (*Juniperus* spp.), and pinyon pine (*Pinus edulis*). Six BAs are located outside of Sonoran Riparian Scrubland areas (Brown 1994). The Becker BA is within the Plains and Great Basin Grassland biome where they nest in an isolated patch of Fremont cottonwoods. 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*).

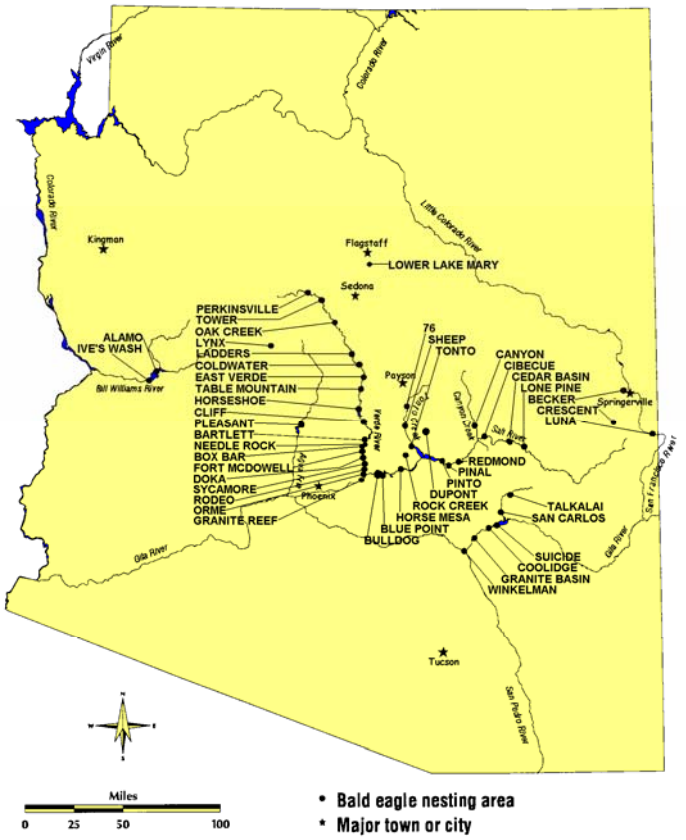


Figure 1. Location of known bald eagle BAs in Arizona, 2005.

Except in 2 BAs (Dupont and Rock Creek BAs), Arizona bald eagles nest within a mile of water. BAs are located along: 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 common on cliff ledges, rock pinnacles, and in cottonwood trees, however they 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' success throughout its range (Stalmaster 1987). In addition, identification of the bald eagle's winter distribution in Arizona was a goal in the 1982 Southwest Bald Eagle Recovery Plan (USFWS 1982). The knowledge of wintering bald eagle habitat use allows for the consideration and implementation of management to protect important wintering areas. Although the USFWS has proposed to delist the species, the importance of the national winter count remains. Through each state's consistent efforts, the winter count will continue to provide post-delisting data on national population fluctuations.

The National Wildlife Federation (NWF) initiated and organized the national bald eagle winter count from 1979-1991. Arizona contributed this information 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 from 1989 to 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, boat, snowmobile, vehicle) and aircraft surveys (e.g. Jacobson et al. 2004). In 1995, AGFD and the NWF established 115 standardized routes for Arizona's bald eagle winter count. The U.S. Geological Survey Biological Division, Snake River Field Station (USGS), now coordinates the national winter count effort.

METHODS

We continue to use, and strive to complete, the established 115 standardized survey routes for the 2005 Arizona bald eagle winter count. Additional routes were completed and integrated into this document for management purposes, but were not included in the results to the USGS. We scheduled the winter count for January 3 to 9, 2005, 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.

Due to the diverse habitat in Arizona, and our desire to maximize (but not duplicate) statewide coverage in a narrow period with minimal effort, we used a variety of survey methods. The best method to survey the rugged terrain and deep canyons of linear drainage is by helicopter. USBR and SRP contributed 4 days of helicopter time for 2 to 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 to 61m (100 to 200 ft) above ground level and 55 to 65 knots (48 to 57 mph) was optimum for observing bald eagles. Highway routes, large lakes, and point counts were surveyed by boats, snowmobiles, vehicles, and on foot. We solicited surveyors from cooperating agencies, and volunteers from private groups. We supplied survey forms from the USGS, and instructed them on the National Survey Protocol.

We classified the bald eagle sightings into adult, subadult, and unknown age classes. 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 survey by county, and 2) the helicopter survey (Appendix A).

RESULTS AND DISCUSSIONS

The 2005 Arizona bald eagle winter count tallied 224 bald eagles (Table 1). We documented 153 adults (68.3%), 56 subadults (25.0%), and 15 unknown eagles (6.7%). The highest number of bald eagles occurred on Lake Mead, Temple Bar (n=25). An additional 21 bald eagles were counted on non-standardized routes (Appendix A).

Table 1. Summary of the Arizona bald eagle winter count 2005.							
County	Routes	Minutes	Adult	Subadult	Unknown	Total	Total/Minute
Verde River drainage	3	142	22	1	0	23	0.1619
Salt River drainage	11	367	32	8	0	40	0.1089
Gila River drainage	7	143	11	6	0	17	0.1188
Various helicopter	4	38	4	0	0	4	0.1052
Apache	9	217	9	1	0	10	0.0460
Cochise	3	300	2	1	0	3	0.0100
Coconino	22	2887	24	9	1	34	0.0117
Graham	1	300	12	9	0	21	0.0700
Greenlee	1	61	0	0	0	0	0
Maricopa	Not Surveyed						
Mohave	4	1880	17	11	12	40	0.0212
Navajo	19	825	13	7	1	21	0.0254
Pima	1	60	0	0	0	0	0
Pinal	1	45	0	0	0	0	0
Santa Cruz	4	255	0	0	0	0	0
Yavapai	6	1260	7	2	1	10	0.0079
Yuma and La Paz	1	130	0	1	0	1	0.0076
Totals	97	8910	153	56	15	224	0.0251

Of the 115 standardized routes, Arizona completed 97 (84.3%). This matches the 1997 and 1998 surveys for the least routes completed. Surveyors spent a total of 8,910 minutes (148.5 hours) searching. The greatest survey effort was in Coconino County, where volunteers searched for 2,887 minutes (48.1 hours) with 0.0117 bald eagles observed per minute.

During the 2005 winter count, Arizona experienced several intense winter storms that posed accessibility and visibility challenges (Fig. 2 and 3). For example, the Verde River winter count flight on January 7, 2005, was ended abruptly at Bartlett Lake due to heavy winds and rainfall. The subsequent rescheduled Verde River winter count flight on January 14th was ended at Oak Creek because of an approaching snow storm. Arizona's winter count volunteers also struggled with these same weather conditions on the ground. The 97 standardized routes completed and the total of 224 bald eagles counted were below average (average 332 since survey routes were standardized in 1995) and are directly correlated to the wet weather conditions experienced in the first 2 weeks of January. Including this year, Arizona counts an average 322 bald eagles during the winter (Table 2).

The percent of adults (68.3%)counted was relatively similar to the national average of 67% adults from 1986-2000 (Steenhof et al. 2002). Statewide winter counts from 1981 to 1985 and 1992 to 2004 averaged 64.3% adults, 33.1% subadults, and 2.6% unknown.

Table 2. Summary of Arizona bald eagle winter counts 1981-1985, 1992-2005.						
Year	Survey Time	Birds/minute	Adults	Subadutls	Unknown	Total
1981	--[1]	--	103 (63%)	60 (36%)	2 (1%)	165
1982	--	--	135 (64%)	72 (34%)	3 (2%)	210
1983	--	--	104 (66%)	53 (33%)	1 (1%)	158
1984	--	--	159 (71%)	63 (28%)	3 (1%)	225
1985	--	--	78 (66%)	40 (34%)	--	118
1992	9,801	0.0230	145 (65%)	70 (31%)	10 (4%)	225
1993	9,938	0.0187	133 (71%)	46 (25%)	7 (4%)	186
1994	7,949	0.0457	263 (72%)	96 (26%)	4 (1%)	363
1995[2]	9,563	0.0259	164 (66%)	76 (31%)	8 (3%)	248
1996	7,255	0.0498	232 (64%)	127 (35%)	2 (1%)	361
1997	7,718	0.0444	193 (56%)	134 (39%)	16 (5%)	343
1998	7,190[3]	0.0416	183 (63%)	103 (36%)	4 (1%)	290
1999	8,378[3]	0.0500	248 (62%)	144 (36%)	11 (3%)	403
2000	9,402[3]	0.0346	202 (62%)	115 (35%)	8 (2%)	325
2001	8,726[3]	0.0248	141 (66%)	70 (32%)	5 (2%)	216
2002	9,032	0.0445	236 (59%)	147 (37%)	19 (5%)	402
2003	10,036[3]	0.0360	232 (64%)	118 (33%)	12 (3%)	362
2004	10,587	0.0349	243 (66%)	113 (31%)	13 (3%)	369
2005	8,910	0.0695	153 (68%)	56 (25%)	15 (7%)	224
Average	8,892	0.0307	176 (64.5%)	90 (33.0%)	8 (2.9%)	273

[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.

Figure 2. Water release at Bartlett Dam in January 2005. Maricopa County, Arizona.

Figure 3. Snow storm near Sedona in January 2005. Yavapai County, Arizona.

MANAGEMENT RECOMMENDATIONS

1. Refine the 115 standardized routes to eliminate those with 0 to 3 bald eagles observed over 10 years of survey per USGS protocol.
2. Add new routes with consistent bald eagle sightings.
3. Encourage/maintain winter count surveyor's consistency by following established routes and methods for long-term analysis potential.
4. Continue updating the Nongame Branch bald eagle winter count database with information from the standardized survey forms.

5. Compile spatial data from winter count survey maps to document the location and abundance of wintering bald eagles, spatially identify important habitat use areas, and develop statewide maps for distribution to cooperating agencies.

ARIZONA BALD EAGLE NEST SURVEY

INTRODUCTION

The bald eagle nest survey enhances our understanding of breeding bald eagle ecology in Arizona. Discovery of new BAs and alternate nests, coupled with the knowledge of current and historical BAs, allows for an accurate description of the distribution, status, and annual productivity of Arizona's breeding population. Timely discovery of BAs also identifies sensitive areas requiring proactive management from 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. 2004). The AGFD administered and performed the 2005 nest survey, 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 2004 (e.g. Jacobson et al. 2004). We also investigated reports of bald eagles and nests by other agencies, biologists, and the public. A 1 to 3 person team conducted surveys between January and June 2005. Winter count flights (January) and monthly occupancy and reproductive assessment (ORA) flights (February to June) 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, 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 to 60 knots (45 to 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 and others (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. 2004).

Determination of breeding status followed operational definitions derived from Postupalsky (1974, 1983) and Steenhof and Kochert (1982) (Appendix B). "Tall" and "short", "large" and "small" are terms used 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 Arizona bald eagle nests and locations. The terms "small" and "short" refer to structures of inadequate height and size.

RESULTS

We examined all known BAs (n=47, including reoccupied Lower Lake Mary Historical BA) for breeding activity (Fig. 1). Of 39 occupied BAs, 36 pairs attempted to breed, and 25 pairs successfully produced 38 fledglings (Table 3, Appendix C). Significant findings of the 2005 nest survey include 5 new alternate bald eagle nests and 5 fallen nests within BAs, 1 reoccupied historical BA, 3 new large nests in new locations, and 2 new golden eagle nests.

Table 3. Summary of Arizona bald eagle productivity 2005.

Number of BAs	47	Number of Active BAs	36
Number of Occupied BAs	39	Number of Failed Breeding Attempts	11
Number of Eggs	57+	Number of Successful Breeding Attempts	25
Nest Success = 25 /39	0.64	Number of Young Hatched	48
Mean Brood Size = 38 /25	1.52	Number of Young Fledged	38
		Productivity = 38 /39	0.97

Results of the individual flights are located in Appendix D. Areas worthy of further discussion (bald eagle observation, 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 (602) 789-3612.

New Locations Surveyed (Table 4)

Blue Ridge Reservoir. – One osprey was observed at a well maintained new nest #1.

Cottonwood Wash. – In January, SCAT wildlife biologists reported a large cottonwood tree nest in Cottonwood Wash east of San Carlos Reservoir. During the February 1 flight, we located and evaluated the nest site. Despite the apparent lack of recent use, this nest is large enough to have been used by bald eagles in the past. Although this could be an alternate nest site for the San Carlos breeding pair when lake levels are high, we will consider this a new nest site until breeding activity is observed.

Fossil Creek. – During the spring 2005 Fossil Creek restoration efforts, AGFD personnel reported multiple sightings of adult bald eagles along the creek. On March 18 and April 21, we surveyed Fossil Creek from the confluence with the Verde River to Fossil Springs. We observed 1 adult bald eagle at the confluence of Fossil Creek and the Verde River, and a new golden eagle nest along Fossil Creek. We will continue to monitor this area for breeding activity, but assumed the sightings were bald eagles from the East Verde BA.

Little Colorado River. – On April 21, we surveyed the Little Colorado River from Holbrook to the Navajo Indian Reservation. No bald eagles or nests were observed. This stretch of the Little Colorado River lacked suitable nesting habitat for bald eagles.

Yellow Cliffs. – On October 16, 2004, we received a report claiming two adult bald eagles were foraging and perching in the Yellow Cliffs area. On October 17, 2004, we surveyed the area and identified one adult bald eagle blue VID banded "12/R" (2000 Pinal nestling) and one unbanded adult. Repeated helicopter searches of the Yellow Cliffs area east of Bartlett Lake yielded no new nests on January 7 and 31. On April 15, a large new and recently used nest #1 was found on a pinnacle 1 km east of Yellow Cliffs, with 1 adult in the area. No nestlings were observed, but

white wash and new construction indicate recent bald eagle use. We will monitor this new location in 2006.

West Clear Creek. – While searching for bald eagle breeding activity along West Clear Creek during the April 21 flight, we located an active golden eagle cliff nest #1 near Tule Canyon.

Table 4. 2005 Arizona bald eagle nest survey summary, new locations.

Location	Date	Survey Method	Results
Bear Canyon Lake	4/14	Helicopter	No new nests or bald eagles.
Blue Ridge Reservoir	4/21	Helicopter	One osprey at well maintained new nest #1.
Canyon Lake	1/14, 4/14	Helicopter	No new nests or bald eagles. 1/14-One subadult bald eagle in area.
Cottonwood Wash	2/1	Helicopter	One new large nest #1 in a cottonwood tree.
Dead Horse State Park	3/18	Helicopter	No new nests or bald eagles.
East Clear Creek	4/21	Helicopter	No new nests or bald eagles.
Fossil Creek	3/18, 4/21	Helicopter	3/18-One adult bald eagle at the confluence with Verde River. 4/21- One new golden eagle nest #1.
Little Colorado River	4/21	Helicopter	No new nests or bald eagles. Limited nesting substrate.
Nelson Reservoir	4/12	Ground	No new nests or bald eagles.
Salt/Gila River Confluence	4/15	Helicopter	No new nests or bald eagles.
Pecks Lake	3/18	Helicopter	No new nests or bald eagles.
Planet Ranch	4/21	Helicopter	Two subadult bald eagles in area.
Yellow Cliffs	1/7, 1/31, 4/15	Helicopter	1/7-Two small nests no bald eagles. 4/15-One new, large, recently used nest #1 found. One adult in area.
West Clear Creek	4/15, 4/21	Helicopter	No bald eagles. 4/21- One active golden eagle nest #1.

Historical Breeding Areas (Table 5)

Hell Point. – ORA flights in late January and mid April, yielded a total of 3 adults and 4 subadults. Although no new nests were found, we feel there is sufficient prey base and nesting habitat available for reoccupation. We will continue to monitor this area.

Lower Lake Mary. – The Lower Lake Mary BA was designated historical in 1982. In February and March 1996, adult and subadult bald eagles were observed perched, and building a nest near the historical nest location, but breeding activity never commenced. On May 23, 2005,USFS biologist, Henry Provencio, reported an active bald eagle nest on Lower Lake Mary. A pair of unbanded adult bald eagles reoccupied the BA and rebuilt historical nest #1.

Table 5. 2005 Arizona bald eagle nest survey summary, historical BAs.

Location	Date	Survey Method	Results
Camp Verde	1/31, 3/18, 4/15	Helicopter	No new nests or bald eagles.
Chino	1/31, 3/18, 4/15,	Helicopter	No new nests or bald eagles.
Devil's Post	1/31, 4/15	Helicopter	All known nests empty. No bald eagles.
Hell Point	1/31, 3/18, 4/15	Helicopter	All known nests empty. 1/31-Two adult and 3 subadult bald eagles, and 1 golden eagle in area. 4/15-One adult and 1 subadult in area.
Lower Lake Mary	6/6, 6/30	Ground	6/6-Two adults in nest feeding 1 1-week old nestling.
Mule Hoof	1/5, 2/1, 317, 4/14	Helicopter	All known nests empty. No bald eagles.

Survey sites with Existing Large Nests (Table 6)
Muldoon. – ORA flights in late January, yielded a total of 2 adult and 3 subadult bald eagles. Although no new nests were found, we periodically observed bald eagles using this area, and feel there is sufficient prey base and nesting habitat available for breeding to occur. We will continue to monitor this area.

Mogollon Rim Lakes. – On the April 14, we surveyed the Mogollon Rim Lakes (Chevelon, Knoll, Willow Springs, and Woods Canyon). On May 9, Woods Canyon Lake was surveyed. Although breeding activity was not observed, these lakes are frequented by adult bald eagles, support breeding osprey, and possess adequate nesting substrate and prey resources to support breeding bald eagles. We will continue to survey this area.

Table 6. 2005 Arizona bald eagle nest survey summary, nest sites.

Location	Date	Survey Method	Results
Chevlon Canyon	4/14	Helicopter	No new nests or bald eagles.
Eagle	1/6	Helicopter	No new nests. One adult bald eagle in area.
Gene Wash	4/21	Helicopter	All known nests empty. No bald eagles.
Granite	1/31, 4/15	Helicopter	All known nests empty. No bald eagles. 4/15-Golden eagle in nest #1.
Knoll Lake	4/14	Helicopter	All known nests empty. No bald eagles.
LF	3/18	Helicopter	No new nests or bald eagles.
Muldoon	1/31, 3/18, 4/15	Helicopter	All known nests empty. 1/31- Two adult and 3 subadult bald eagles. 4/15-One golden eagle standing in nest.
Sullivan Lake	1/31, 3/18, 4/15	Helicopter	All known nests empty. No bald eagles.
Willow	1/6	Helicopter	No new nests or bald eagles.
Willow Springs Lake	4/14	Helicopter	All known nests empty. No bald eagles. One osprey in area.
Woods Canyon Lake	4/14, 5/9	Helicopter	All known nests empty. No bald eagles. 4/14-Two ospreys in area. 5/9-One osprey standing in nest #3.

Breeding Areas (Table 7)
Cliff. – The Cliff BA continues to be unoccupied. Although we regularly find non-breeding adult and subadult bald eagles using this area, breeding activity has not been documented. It is possible that the Cliff pair has moved downstream to the Yellow Cliff's area (see New Areas Surveyed).

Coldwater. – Last year, we mistakenly reported nest #3 fallen instead of nest #4. Nest #3 still exists.

Coolidge. – During a ground visit on April 5, Stefanie White and Luke Zospah documented the nest branch for nest #4 had broken.

Doka. – Nest #2 fell before January 7. On the January 31 flight, 1 adult was observed incubating in new nest #3.

Fort McDowell. – On the January 31 flight, we documented 1 adult incubating in nest #16. During the month of February, heavy rainfall and the consequent emergency runoff into the Verde River from Bartlett dam yielded flows exceeding 40,000 cfs. On the March 18 flight, we

observed the nest #16 tree in the main channel of the Verde River, 200 meters downstream of its original location. On April 15, we observed 1 adult standing in nest #15.

Oak Creek. – During a ground visit on November 30, 2004, Janie Agyagos, USFS Red Rock R.D., documented nest #2 had fallen. Prior to January 31, 2005 the nest tree was washed away by winter floods. During the flight on March 18, we observed 1 adult incubating in cliff nest #2.

Rock Creek. – On March 17, we found 1 adult incubating in a new ponderosa pine snag nest # 3.

Rodeo. – On April 24, ABENWP contractors reported that nest #2 had partially fallen and the 2 8-week old nestlings were missing. On the May 9 ORA flight, the partially fallen nest #2 was confirmed and the nestlings were not located. The Rodeo nest #2 partially falls annually and needs reinforcement to help ensure yearly success.

Sheep. – Nest #1 snag fell between February 1 and March 17 during periods of 10,000 cfs floodwaters.

Tonto. – In January, we found a new nest #4 in the same tree as nest #2.

Table 7. 2005 Arizona bald eagle nest survey summary, BAs.

Location	Date	Survey Method	Results
Becker	1/6, 4/12	Ground	All known nests empty. 1/6-One subadult bald eagle in area.
Canyon	1/14, 2/1, 3/17, 4/14	Helicopter	All known nests empty. No bald eagles.
Cedar Basin	1/5, 2/1, 3/17, 4/14	Helicopter	All known nests empty. No bald eagles.
Cliff	1/7, 1/31, 3/18, 4/15	Helicopter	1/7-Four adult bald eagles in area. 1/31-Two adults and 4 subadults in area. 3/18-One adult and 6 subadults. 4/15-One adult and 3 subadult bald eagles.
Coolidge	1/14, 2/1, 3/17, 4/5	Ground Helicopter	All known nests empty. 2/1-One subadult bald eagle in area. 4/5-Nest branch broke.
Crescent	1/5, 4/14	Helicopter	1/5-Nest full of snow. 4/14-One adult incubating in nest #1.
Doka	1/7, 1/31	Helicopter	1/7-Nest snag #2 fell. 1/31-One adult incubating in new nest #3.
Dupont	1/14, 2/1, 3/17, 4/14	Helicopter	1/14-All known nests empty. No bald eagles. 4/21 – Two new large cliff nests found.
East Verde	1/7, 1/31, 3/18, 4/15	Helicopter	All known nests empty. 1/7-One adult standing in nest #6. Second adult in area.
Fort McDowell	1/31, 3/18, 4/15	Helicopter	1/31-One adult incubating in nest #16. 3/18-Nest #16 washed away in floods. 4/15-One adult standing in nest #15.
Granite Basin	2/1, 3/17	Helicopter	All known nests empty. No bald eagles.
Oak Creek	1/31, 3/18	Helicopter	1/31-Nest #1 tree washed away in floods. 3/18-One adult incubating in nest #2.
Redmond	1/14, 2/1, 4/14	Helicopter	All known nests empty. 1/14-Two adults in area. 2/1-Nest #5 with fresh material.
Rock Creek	2/1, 3/17	Helicopter	2/1- Nest #2 full of snow. 3/17-One adult incubating in new pine snag nest #3.

Table 7. continued.

Location	Date	Survey Method	Results
Rodeo	1/7, 1/31, 3/18, 5/9	Helicopter	1/7-Two adults building on small nest structure. 1/31 – One adult incubating in nest #2. 5/9-Nest #2 confirmed partially fallen and 2 10-week old nestlings missing.
76	1/14, 2/1, 3/17	Helicopter	All known nests empty. No bald eagles.
Sheep	3/17	Helicopter	3/17-Nest #1 tree snag fell.
Tonto	1/14	Helicopter	1/14-New nest #4.
Winkelman	2/1	Helicopter	All known nests empty. No bald eagles.

Overview

Significant findings of the 2005 nest survey include: 5 new alternate bald eagle nests and 5 fallen nests within BAs, 1 reoccupied historical BA, 3 new large nests in new locations, and 2 new golden eagle nests.

The Lower Lake Mary Historical BA was discovered reoccupied and has been returned to active BA status. The Lower Lake Mary BA was discovered in 1970 and supported breeding activity until 1972. In the 1980s, the BA was designated historical after a period of non-use. In February and March of 1996, an adult and a subadult bald eagle were building on nest #1, but breeding activity was never documented. On May 23, 2005, USFS biologist Henry Provencio reported Lower Lake Mary nest #1 to be active.

Figure 4. Reoccupied Lower Lake Mary Historical BA, Coconino County, Arizona.

With breeding activity in the White Mountains (Luna and Crescent BAs) and now Flagstaff (Lower Lake Mary BA), it appears that the Arizona bald eagle population is expanding its distribution into higher elevation areas. Due to our level of isolation, this expansion is important to eliminate the current distribution gap between Arizona bald eagles, and populations in Utah, Colorado, New Mexico and California. Continued monitoring of the lakes, streams, and canyons throughout the White Mountains and Mogollon rim area will become increasingly important to document, monitor, manage, and promote this expansion.

The continued creation and loss of alternate nests, coupled with the expansion and distribution of Arizona bald eagles, further demonstrates the necessity and importance of ORA flights. These flights allow for consistent monitoring of population numbers, distribution, and their reproductive success in the rugged terrain of Arizona. Without the aid of these flights, we would not be able accurately to document these important demographic parameters.

MANAGEMENT RECOMMENDATIONS

1. Future survey efforts should monitor historical 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 of our population 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 Arizona bald eagle population reaches into these surrounding areas, and would help accurately to estimate survivorship.
3. Surveyors should continue to use the nest survey, ORA, and winter count flights, in concert with follow-up ground surveys to inspect areas. From the air, surveyors can easily cover large sections of bald eagle habitat. Follow-up ground surveys thoroughly investigate an area.
4. Reinforce Rodeo nest #2 to prevent nestling loss.
5. Examine the following areas for breeding bald eagles and/or nests:
    - Agua Fria River drainage – Up and downstream from Lake Pleasant.
    - Big Sandy River drainage – Upper Trout 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, Willow Springs.
    - Colorado River drainage – Lake Mead (Grand Wash), Gene Wash Reservoir, 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 used 2 Maricopa Audubon Society volunteers to monitor bald eagles near Bartlett Reservoir to understand the effects of recreation. This monitoring effort eventually expanded to other BA's, and developed into the ABENWP. In 1986, the USFWS assumed coordination of the ABENWP on behalf of the 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/reduce the threat.

In this report, we summarize significant discoveries at each monitored BA in 2005. Detailed reports of each monitored BA are centralized at AGFD, and distributed to the appropriate land and wildlife management agencies.

METHODS

We select the BAs to be monitored by weighing the level of recreation activity and management needs. Included are those with seasonal closures (Box Bar, Ladders, Lower Lake Mary, Luna, Needle Rock, Pinto, Pleasant, San Carlos, Tonto, and Tower), those without (Coolidge, Crescent, and Orme), and those monitored for opportunistic information (Granite Reef). In the fall of 2004, we advertised the ABENWP contract positions through the American Ornithologists Union Newsletter, American Birding Association Biology web page, Texas A&M web page, Wildlife Society web page, 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 several question and answer sessions for the selected ABENWP contractors. The 2 meetings offered an introduction to the program, background 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 before every other 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 4, 2005, 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 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 kilometer 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 (3300 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 eagle 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. To accurately describe activities that caused bald eagle behavior change, "restless," "flushed," and "left area" responses, are considered significant.

At the Pleasant, Tonto, Box Bar, and Needle Rock BAs, nestwatchers recorded human activity differently than described above. They recorded compliance with the Pleasant, and Tonto BA closures by documenting the number of boats and jet skis approaching the buoy line and those that entered. If the watercraft entered the closure and proceeded past the nestwatchers, they were documented as "inside the closure." Conversely, they recorded those who complied with the closure or those who were contacted by the nestwatchers as "at the closure." 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.

Nestwatchers documented all aspects of bald eagle behavior at their BA. They documented 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.

Contrary to years before 2002, the nestwatchers 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 shift in 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 were instructed to use the weekdays to document the locations and types of habitat use within the breeding pair's home range. This prohibited 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.

Management considerations included in this report are taken directly from the individual BA 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.

RESULTS AND DISCUSSION

The ABENWP monitored 14 BAs in 2005. Those include: Box Bar, Coolidge, Crescent, Granite Reef, Ladders, Lower Lake Mary, Luna, Needle Rock, Orme, Pinto, Pleasant, San Carlos, Tonto, and Tower. The final status of monitored BAs was 1 occupied, 3 failed, 10 successful, and 13 young fledged (Appendix C).

The Granite Reef BA was monitored opportunistically by nestwatchers at an adjacent BA, and the Crescent BA was only briefly monitored prior to failure; therefore, data for these BAs are not included in this report.

Box Bar Breeding Area

Figure 5. Box Bar BA in 1999. Maricopa County, Arizona.

Figure 6. Box Bar BA during floods of February 2005. Maricopa, County, Arizona.

Observation Period. – February 4 to April 26. Total monitoring 64 days/548 hours.

Bald Eagle Identification. – The male is blue VID "5/G" on his left leg, USFWS banded on the right leg, and in adult plumage (Pleasant 1994 nestling). The female is 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 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) The 1 male nestling was VID banded "17/Y" at 6 weeks of age.

Human Activity. – Nestwatchers recorded 58 human activities within the closure (Appendix E). Aircraft activity (helicopters, small planes, and ultra-lights) represented 53.4% and terrestrial activity (campers, gunfire, and OHVs) represented 46.6%. Two activities elicited 2 significant responses from the breeding pair. The bald eagles were restless to 1 helicopter and ultra light each. This is significantly lower than previous years due to high water flows.

Food Habits. – Nestwatchers observed 49 forage attempts. The male was successful in 73.0% (n=37), the female in 75.0% (n=8), and an unknown adult in 100% (n=4). Of these attempts, fish

accounted for 49.0%, birds 4.1%, mammals 2.0%, and unknown 44.9%. The breeding pair delivered 79 prey items to the nest. The male delivered 78.5%, the female 13.9%, and an unknown adult 7.6%. The common prey type was fish (48.1%), although mammals (6.3%) and birds (1.3%) were also taken. Of these prey deliveries, 44.3% were unknown and none were identified to species.

Habitat Use. – The Box Bar nestwatchers identified 29 habitat use areas that spanned a 2.7 km stretch of the Verde River ranging from rk 22.3 to 25.0. The pair spent 61.7% of their time at rk 24.9, 15.7% at rk 23.2, 5.5% at rk 24.2, and 17.1% at the remaining perch locations.

Coolidge Breeding Area

Observation Period. – February 5 to March 13. Total monitoring 28 days/190 hours.

The breeding pair failed to lay eggs after 28 days of monitoring. The ABENWP contractors were reassigned to the Pinto BA.

Bald Eagle Identification – The male and female are both unbanded and in adult plumage.

Figure 7. Coolidge BA. Gila County, Arizona.

Management Activities. – 1) ABENWP contractors were introduced to the SCAT police in an orientation session held on their first day in the field. 2) The SCAT Police and wildlife biologists visited the ABENWP contractors on a regular basis.

Human Activity. – During their short monitoring period, nestwatchers recorded 8 human activities. Terrestrial activities (woodcutters and vehicles) accounted for 62.5% and aircraft (small planes and jets) for 37.5%. None of these activities elicited significant responses from the breeding pair.

Food Habits – Nestwatchers observed 3 forage attempts for fish by the female, and she was successful in 33.3% (n=3).

Habitat Use – The Coolidge nestwatchers identified 41 separate perch locations along the Gila River (Appendix F). River perches spanned a total of 6.4 km ranging from rk 23.2 to 29.6. The pair spent 30.1% of their time at rk 25.3, 19.4% at rk 25.2, 12.2% at rk 24.9, 10.2% at rk 28.4, 8.9% at rk 24.8, and 19.2% at the remaining perch locations.

Ladders Breeding Area

Observation Period. – April 1 to June 8. Total monitoring 53 days/499 hours.

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

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

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 male and female nestlings were VID banded "18/V" and "18/R" at 5 weeks of age, respectively.

Interventions – On May 26, nestwatchers reported that the male nestling pre-fledged and was on the ground across the river from the nest. By June 1, the adults had not fed the fledged nestling, so AGFD personnel captured, fed, and released the nestling. Two fish were left on the shore for the nestling to eat at a later time. On June 3, the pre-fledged male nestling was observed flying throughout the BA, but the female nestling was now missing from the nest. After a week of intensive searching, the second nestling was never located and presumed dead.

Figure 8. Ladders BA. Yavapai County, Arizona.

Human Activity – Nestwatchers recorded 139 human activities (Appendix G). Watercraft (canoes/kayaks and rafters) represented 60.5%, aircraft (small planes and helicopters) 36.0%, and terrestrial activities (dogs, hikers, and ranchers) 3.5%. Two activities elicited 4 significant responses from the breeding pair. The bald eagles were restless in response to 1 canoe/kayak. The pair flushed in response to 2 canoes/kayaks. One helicopter caused the RA to protectively mantle the young nestlings while it flew past the nest.

Food Habits – Nestwatchers observed 12 forage attempts. The male was successful in 80.0% (n=5) and the female in 57.1% (n=7). Of these attempts, 83.3% were for fish, and 8.3% for mammals and unknown prey types each. The breeding pair delivered 57 prey items to the nest. The male delivered 78.9%, the female 17.5%, and an unknown adult 3.5%. The common prey types consisted of fish 73.7%, mammals 5.3%, reptiles 1.8%, and 19.3% were of unknown prey types. Of the 19 items that could be identified to species, 47.4% were suckers (*Catostomus spp*), 31.6% catfish (*Ictalurus punctatus*), 10.5% carp (*Caprinus carpio*) and rabbit species (*Lepus and Sylvilagus spp.*) each.

Habitat Use – The Ladders nestwatchers identified 116 perch locations along the Verde River. River perches spanned a total of 6.7 km ranging from rk 157.2 to 163.9. The pair spent 21.8% of the observed time at rk 163.0, 17.8% at rk 162.9, 13.2% at rk 163.1 and 162.2 each, 8.8% at rk 162.1, and 25.2% at the remaining perches.

Lower Lake Mary Breeding Area
Observation Period. – June 16 to August 6. Total monitoring 38 days/316 hours.

ABENWP contractors were assigned to the Lower Lake Mary BA after the Luna fledglings fledged and Crescent BA failed. Therefore, observation dates and times vary.

Bald Eagle Identification – The male and female are unbanded and in adult plumage.

Figure 9. Lower Lake Mary BA. Coconino County, Arizona.

Management Activities. – 1) The USFS enacted a closure around the nest tree. 2) Closure signs were placed at vehicle access points. 3) The male nestling was blue VID banded "18/X" at 5 weeks of age.

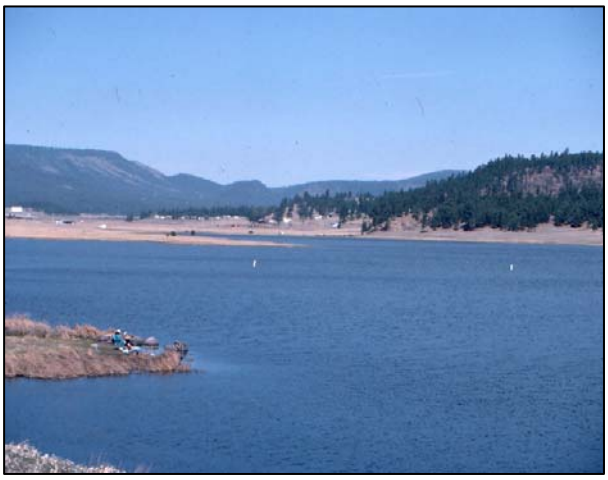
Interventions. – On August 2, nestwatchers observed the nestling perched below the nest. Within 3 hours, the nestling was no longer in the nest tree and could not be located. On the following morning, Susi MacVean, AGFD, and the nestwatchers located the nestling below the nest tree. While rescue personnel were in transit, the bald eagle's condition quickly declined from active and alert to lethargy, vomiting, and ultimately death. The carcass was retrieved and sent to the National Wildlife Health Center for a necropsy. Results indicated cause of death was massive hemorrhaging and broken bones associated with falling from the nest. In addition, this bald eagle tested positive for West Nile Virus (WNV). It is unknown if WNV contributed to the nestling falling from the nest tree.

Human Activity. – Nestwatchers recorded 347 human activities (Appendix H). Terrestrial activities of 10 different types represented 57.6%, watercraft (boats, canoes/kayaks, and float tubes) 40.6%, and aircraft (helicopters) 1.7%. Ten activities elicited 24 significant responses from the breeding pair. The bald eagles were restless in response to 3 gunshots, sirens, and helicopters each, 2 OHVs, equestrians, and construction each, and 1 dog. The breeding pair flushed in response to 2 canoes/kayaks, helicopters, hikers, and bicyclists each.

Food Habits. – Nestwatchers observed 47 forage attempts. The male was successful in 90.6% (n=32) and the female in 100% (n=15). Of these attempts, 80.9% were for fish, 6.4% for mammals, and 12.8% for unknown prey types. The breeding pair delivered 45 prey items to the nest. The male delivered 66.7% and the female 33.3%. Of these prey items, fish accounted for 82.2%, mammals 6.7%, and unknown prey types 11.1%. Of the 40 items that could be identified to species, 87.5% were rainbow trout (*Oncorhynchus mykiss*), 5.0% catfish species, and 7.5% ground squirrels (*Spermophilus spp.*).

Habitat Use. – The Lower Lake Mary nestwatchers identified 10 separate perch locations around the lake. Perches spanned a total of 2.7 km ranging from rk 2.0 to 4.7. The pair spent 41.4% of their time at rk 2.3, 34.7% at rk 2.2, 10.3% at rk 2.0, and 13.6% at the remaining perch locations.

Luna Breeding Area



Observation Period. – February 4 to June 5. Total monitoring 90 days/791 hours.

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

Figure 10. Luna BA. Apache County, Arizona.

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) The USFS housed the nestwatchers in a bunkhouse. 4) The 2 male nestlings were VID banded "18/H" and "18/K" at 7.5 weeks of age.

Human Activity. – Nestwatchers recorded 1,253 human activities (Appendix I). Terrestrial activities represented 78.2% of 11 different types, watercraft (boats, float tubes, and canoes/kayaks) 20.7%, and aircraft (military jets, helicopters) 1.1%. Eight activities elicited 23 significant responses from the breeding pair. The bald eagles were restless in response to 7 military jets, 2 picnickers, agency workers, and construction each, and 1 boat and canoe/kayak each. The breeding pair flushed in response to 3 military jets and gun shots each. The bald eagles left the area in response to 2 ATVs/motorcycles.

Food Habits. – Nestwatchers observed 149 forage attempts. The male was successful in 67.8% (n=90), the female 80.4% (n=56), and an unknown adult 100% (n=3). The most common forage item was birds 63.1%, although fish 14.1%, mammals 4.7%, herps 0.7%, and unknown prey types 15.4% were also hunted. The breeding pair delivered 109 prey items to the nest. The male delivered 56.0%, the female 41.3%, and an unknown adult 2.8%. Birds composed 49.5% of those items, 19.3% fish, 6.4% mammals, 2.8% carrion, 0.9% herps, and 21.1% unknown. Of the 83 items that were identified to species, 55.4% were American coots (*Fulica Americana*), 15.7% rainbow trout, 9.6% waterfowl species, 9.6% cutthroat trout (*Oncorhynchus clarki*), 4.8% gophers (*Thomomys spp.*), 2.4% ground squirrels, and 1.2% rabbit species and garter snakes (*Thamnophis* spp.) each.

Habitat Use. – The Luna nestwatchers identified 17 separate perch locations around the lake. Perches spanned a total of 4.8 km ranging from lk 0.3 to 5.1. The pair spent 53.0% of their time at lk 2.4, 8.0% at lk 2.7, 7.0% at lk 2.5, 5.7% at lk 2.3, and 26.3% at the remaining perch locations.

Needle Rock Breeding Area

Observation Period. – February 4 to May 22. Total monitoring 72 days/666 hours.

Bald Eagle Identification. – The male is blue VID banded "9/T" on his left leg, USFWS banded on the right leg, and in adult plumage (1998 Orme nestling). The female is USFWS banded on her right leg, and in adult plumage (Unknown origin).

Figure 11. Needle Rock BA. Maricopa County, Arizona.

Management Activities. – 1) The USFS enacted the seasonal BA closure. 2) The owners of Rio Verde Ranch allowed ABENWP to camp on their lawn. 3) ABENWP contractors were active in educating the public visiting the Needle Rock Recreation Area. 4) The 2 female nestlings were banded "18/D" and "18/E" at 4.5 weeks of age.

Interventions. – On May 21, 1 nestling fell from the nest and landed on a branch below the nest. On May 22, the second nestling was missing from the nest and both nestlings were found on the ground in poor condition with multiple bee stings around the eyes and mouth. AGFD personnel captured the nestlings and delivered them to Liberty Wildlife Rehabilitation Center. The nestling banded "18/D" died in transit. The second nestling was stabilized, rehabbed, and eventually released into the Cliff BA on September 14.

Human Activities. – Nestwatchers recorded 28 human activities (Appendix J). Aircraft (helicopters, small planes, and motor para-gliders) represented 78.6%, watercraft (boats) 14.3%, and terrestrial activities (hikers) 7.1%. Three activities elicited 3 significant responses. The breeding pair flushed in response to 1 helicopter, boater, and motor para-glider each. This is significantly lower than previous years due to high water flows.

Food Habits. – Nestwatchers observed 95 forage attempts. The male was successful in 55.6% (n=45), the female in 54.6% (n=44), and an unknown adult in 66.7% (n=6). The most common forage item was fish 65.3%, mammals 3.2%, and unknown prey types 31.6%. The breeding pair delivered 35 prey items to the nest. The male delivered 25.7%, female 54.3%, and an unknown adult 20.0%. Fish composed 28.6%, mammals 8.6%, and unknown prey types 62.9%. No prey items were identified to species.

Habitat Use. – The Needle Rock nestwatchers identified 34 separate perch locations along the Verde River. River perches spanned a total of 5.7 km ranging from rk 25.2 to 30.9. The pair spent 18.0% of their time at rk 26.0, 14.6% at rk 30.9, 8.1% at rk 26.5, 8.0% at rk 29.5, 7.4% at 27.3, and 43.9% at the remaining perch locations.

Orme Breeding Area

Observation Period. – February 5 to May 22. Total monitoring 79 days/695 hours.

Bald Eagle Identification. – The male and female are unbanded and in adult plumage.

Management Activities. – 1) The 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) Two male nestlings were banded "17/Z" and "18/A" at 6 weeks of age.

Human Activity. – Nestwatchers recorded 575 human activities (Appendix K). Aircraft (helicopters, small planes, and Apache helicopters) represented 58.1%, terrestrial activities of 17 different types 29.2%, and watercraft of 4 different types 12.7%. Eleven activities elicited 37 significant responses by the breeding pair. The bald eagles were restless to 4 Apache helicopters, 2 canoes/kayaks, and 1 helicopter, hiker, and agency worker each. The breeding pair flushed in response to 4 hikers, 2 canoes/kayaks, agency workers, and birders each, and 1 helicopter, Apache helicopter, photographer, and hunter each. The breeding pair left the area in response to 2 agency workers, and 1 helicopter, hiker, birder, and construction each. The bald eagles were startled in response to 4 Apache helicopters, and 1 helicopter, small plane, photographer, and truck horn each.

Figure 12. Orme BA. Maricopa County, Arizona.

Food Habits. – Nestwatchers observed 56 forage attempts. The male was successful in 45.5% (n=22) attempts, the female in 30.8% (n=26), and an unknown adult in 75.0% (n=8). The most common forage item was fish 62.5%, although birds 14.3% and unknown prey types 23.2% were also hunted. The breeding pair delivered 33 prey items to the nest. The male delivered 39.4%, the female 42.4%, and an unknown adult 18.2%. Fish composed 60.6%, mammals 6.1%, birds 3.0%, and unknown prey types 30.3%. No prey items were identified to species.

Habitat Use. – The Orme nestwatchers identified 27 separate perch locations along the Verde and Salt Rivers. River perches spanned a total of 4.2 km ranging from rk 0.2 to 2.0 on the Verde River and rk 4.6 to 7.0 on the Salt River. The pair spent 72.9% of their time at rk 0.4 (Verde River), 9.8% at rk 1.0 (Verde River), and 17.3% at the remaining perch locations.

Pinto Breeding Area

Observation Period. – March 19 to May 18. Total monitoring 44 days/413 hours.

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

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

Management Activities. – 1) The Southwester Willow Flycatcher Closure limited recreational activities on the west side of the Salt River. 2) AGFD enacted a 300 ft water closure around the nest tree. 3) BOR provided nestwatchers a boat to use while educating the public and monitoring breeding bald eagle's habitat use.

Human Activity. – Nestwatchers recorded 375 human activities (Appendix L). Watercraft (boaters/jet skis and kayakers/rafters) accounted for 89.6%, aircraft (small planes and helicopters) 5.6%, and terrestrial activity of 5 different types 4.8%. Two activities elicited 7 significant responses from the breeding pair. The bald eagles flushed in response to 1 boater/jet ski and left the area in response to 5 boaters/jet skis and 1 gunshot.

Figure 13. Pinto BA. Gila County, Arizona.

Food Habits. – Nestwatchers observed 41 forage attempts. The male was successful in 42.1% (n=19) and the female in 45.5% (n=22). Of these attempts, 73.2% were for fish and 26.8% were for birds. The breeding pair delivered 73 prey items to the nest. The male delivered 64.4%, the female 34.2%, and an unknown adult 1.4%. Prey items consisted of fish 69.9%, birds 1.4%, and unknown prey types 28.8%. No prey items were identified to species.

Habitat Use. – The Pinto nestwatchers identified 59 separate perch locations on the Salt River arm of Lake Roosevelt. Perches spanned a total of 7.0 km ranging from rk 101.0 to 108.0. The breeding pair spent 14.8% of the time at rk 102.5, 11.3% at rk 107.2, 7.8% at rk 106.0, 6.9% at rk 102.3, 6.7% at rk 102.6, 6.5% at rk 102.8, and 46.0% at the remaining perch locations.

Pleasant Breeding Area

Observation Period. February 4 to March 28. Total monitoring 40 days/350 hours.

The Pleasant BA failed before February 4 and the second clutch failed by March 26. The contractors were moved to the Ladders BA.

Bald Eagle Identification. – The male is blue VID banded "W" on his left leg, USFWS banded on the right leg, and in adult plumage (1987 Horse Mesa nestling). The female is blue VID banded "11/C" on the left leg, USFWS banded on the right leg, and in adult plumage (2000 Box Bar nestling). The female is the granddaughter of the male.

Figure 14. Pleasant BA. Maricopa County, Arizona.

Management Activities. – 1) MCPRD enacted the seasonal closure around the active nest. 2) MCPRD marked closure boundaries with buoys and signs. 3) Nestwatchers were supplied a boat

and stationed at the southern closure boundary to educate recreationists on the closure and bald eagles.

Human Activity. – Nestwatchers recorded 113 human activities (Appendix M). Aircraft (small planes, helicopters, and military jets) represented 50.4% and watercraft of 4 different types 49.6%. The only significant response elicited from the breeding pair was 2 restless reactions to small planes. Of the 696 watercraft that approached the southern buoy line, only 31 (4.5%) did not comply (agency boats omitted). Boats represented 96.8% of those non-complying, and 3.2% jet skis. Within the type of watercraft, only 4.3% (n=663) of the boats and 0.1% (n=33) of the jet skis did not comply with the closure. Of these violations, 73.0% occurred on a weekend.

Habitat Use. – The Pleasant nestwatchers identified 32 separate perch locations along the Agua Fria arm of Lake Pleasant. Perches spanned a total of 6.2 km ranging from rk 67.4 to 73.6. The breeding pair spent 59.1% of the time at rk 68.8, 23.4% at rk 68.9, and 17.5% at the remaining perch locations.

San Carlos Breeding Area
Observation Period. – February 6 to May 19. Total monitoring 78 days/525 hours.

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

Figure 15. San Carlos BA. Gila County, Arizona.

Management Activities. – 1) ABENWP contractors were introduced to the 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.

Human Activity. – Nestwatchers recorded 97 human activities (Appendix N). Terrestrial activities of 11 different types accounted for 93.8% and Aircraft (small planes, sonic booms, and helicopters) accounted for 6.2%. Three activities elicited 5 significant responses from the breeding pair. The bald eagles were restless to 1 jet, flushed in response to 1 hiker, and left the area in response to 2 researchers and 1 hiker.

Food Habits. – Nestwatchers observed 9 forage attempts. The male was successful in 42.9% (n=7) and the female in 100% (n=2). Foraging attempts consisted of 44.4% fish, 11.1% birds, and 44.4% unknown prey types. The breeding pair delivered 71 prey items to the nest. The male delivered 59.2% and the female 40.8%. Of the delivered items, 57.7% were fish, 2.8% birds, 1.4% mammals and reptiles each, and 36.6% unknown prey types. Of the 7 items that could be identified to species, 42.9% were largemouth bass (*Micropterus salmoides*), 28.6% black crappie (*Pomoxis nigromaculatus*) and goldfish (*Carassius* auratus) each.

Habitat Use. – The San Carlos nestwatchers identified 16 separate perch locations along the San Carlos River. River perches spanned a total of 5.6 km ranging from rk 5.8 to 11.4. The breeding pair spent 47.2% of the time at rk 11.0, 34.7% at rk 11.1, 10.8% at rk 11.4, and 7.3% at the remaining perch locations.

Tonto Breeding Area

Observation Period. – February 4 to May 22. Total monitoring 74 days/535 hours.

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

Figure 16. Tonto BA. Gila County, Arizona.

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 AGFD enacted a 300ft water closure around the nest tree. 4) AGFD supplied nestwatchers with a boat to facilitate in educating recreationists on the closure and bald eagles.

Human Activity. – Nestwatchers recorded 656 human activities (Appendix O). Watercraft of 4 different types accounted for 95.1%, aircraft (helicopters, motor-parachutes, and small planes) 4.1%, and terrestrial activity of 4 different types 0.8%. Two activities elicited 3 significant responses from the breeding pair. The bald eagles flushed in response to 1 boat and protectively soared over the BA in response to 2 motor-parachute occurrences. Of the 623 watercraft that approached the closure, 54 (8.7%) did not comply (agency boats omitted). Boats represented 81.5% of those non-complying, canoes/kayaks 11.1%, and jet skis 7.4%. Within type of watercraft, 7.4% (n=592) of the boats, 28.6% (n=21) of the canoes/kayaks, and 40.0% (n=10) of the jet skis did not comply.

Food Habits. – The nestwatchers observed 22 forage attempts. The male was successful in 63.6% (n=11), the female in 77.8% (n=9), and were 100% successful when hunting in tandem (n=2). Of these forage attempts, 81.8% were fish and 18.1% unknown prey types. The breeding pair delivered 58 prey items to the nest. The male delivered 55.2% and the female 44.8%. Fish comprised 50% of those items, 6.9% birds, 5.2% mammals, 1.7% herps, 17.2% carrion, and 19.0% unknown prey types. Of the 6 prey items identified to species, 50.0% were black crappie, 16.7% rainbow trout, carp, and smallmouth bass (*Micropterus dolomieu*) each.

Habitat use. – The Tonto nestwatchers identified 26 separate perch locations along Tonto Creek. River perches spanned 2.6 km ranging from rk 16.0 to 18.6. The breeding pair spent 75.2% of the observed time at rk 16.8, 8.4% at rk 16.5, and 16.4% at the remaining perch locations.

Tower Breeding Area

Observation Period. – February 4 to May 22. Total monitoring 62 days/498 hours.

Bald Eagle Identification. – The male is purple VID banded "Diamond 8" on his left leg, USFWS banded on the right leg, and in adult plumage (1988 Ladders nestling). The female is unbanded and in adult plumage.

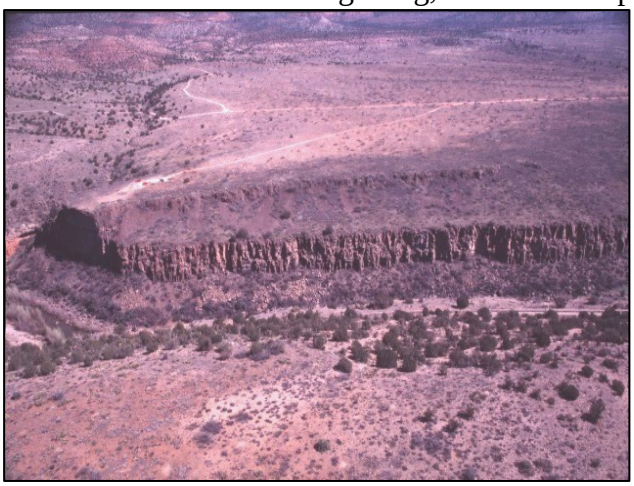


Figure 17. Tower BA. Yavapai, County, Arizona.

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) The male and female nestlings were VID banded "18/C" and "18/B" at 5 weeks of age, respectively.

Human Activity. – Nestwatchers recorded 213 human activities (Appendix P). Terrestrial activities (trains, hikers, and campers) represented 85.9%, aircraft (small planes and helicopters) 13.6%, and canoes/kayaks 0.5%. One activity elicited 17 significant responses from the breeding pair. The bald eagles flushed to 17 passing trains.

Food Habits. – Nestwatchers observed 3 forage attempts. The male was not successful in his 1 observed attempt and the female was successful in 100% (n=2). All of these forage attempts were for fish. The breeding pair delivered 23 prey items to the nest. The male delivered 34.8% and the female 65.2%. Fish comprised 78.3% and unknown prey types 21.7%. No prey types were identified to species.

Habitat Use. – The Tower nestwatchers identified 32 separate perch locations along the Verde River. River perches spanned a total of 4.0 km ranging from 247.0 to 251.0. The pair spent 22.0% of the observed time at rk 248.1, 21.2% at rk 248.0, 14.7% at rk 248.2, 8.9% at rk 247.7, 8.2% at rk 247.2, and 25.0% at the remaining perch locations.

OTHER INTERVENTIONS

Granite Reef Breeding Area

On May 22, the Orme nestwatchers reported the Granite Reef nestling missing from the nest. The nestling was found on the ground and moderately dehydrated. The nestling was taken to Liberty Wildlife Rehabilitation Center for hydration and returned to the nest on May 24. Within minutes after being released, the nestling pre-fledged a second time. After recovering the nestling a second time, we placed the young juvenile in a cottonwood near the Salt River. Observing nestwatchers reported the nestling leaving the cottonwood within 15 minutes of leaving the area. With the juvenile pre-flighted and unwilling to stay on high perches, daily monitoring and nightly intervention ensued. Each evening at dusk, the bald eagle was located, captured, and placed on a safe perch for the evening. On June 1, the bald eagle was flying and perching safely within the breeding area.

MANAGEMENT CONSIDERATIONS

Box Bar Breeding Area
1. Extend the closure boundary south to the Fort McDowell Yavapai Nation property boundary.

Ladders Breeding Area
1. Replace inconsistent and/or missing signs throughout the breeding area.
2. Extend closure to June 30.
3. Require dogs to remain in the boats while passing through the closure.
4. Display an interpretive bald eagle sign at the Beasley Flat boat launch area.
5. Distribute bald eagle brochures throughout the area.
6. Increase efforts to address FAA related issues.

Lower Lake Mary Breeding Area
1. Sign, publicize, and enforce breeding area closure.
2. Maintain closure signs at the junction of CR 132 and FR 296A as well as at closure boundary.
3. Post signs along east, north, and south sides of the closure.
4. Increase public outreach efforts in the area.
5. Develop a management plan for the area.

Luna Breeding Area
1. Maintain closure boundaries, including Group Campsite A, as they currently are.
2. Establish an island within the closure to benefit breeding waterfowl.
3. Provide trash receptacles in or near parking areas.
4. Consider re-implementing the monofilament recovery program.
5. Consider repainting or replacing weather worn signage for waterfowl closure.

Needle Rock Breeding Area
1. Remove bee hive from nest tree.
2. Fence the riparian area surrounding the river to prevent vehicle traffic in the area.

Orme Breeding Area
1. Block road at nestwatcher parking area to prevent people driving to the river.
2. Have nestwatchers park in a less conspicuous location.
3. Consider restricting cattle and horse access to riparian area.

Pinto Breeding Area
1. Continue enacting the water closure during high lake levels.
2. Improve sign and fence leading into Meddler Wash.

Pleasant Breeding Area
1. Make buoy line more distinguished as a closure line as opposed to a no wake zone.
2. Increase efforts to address FAA related issues.
3. Post a sign at the park entrance that illustrates the bald eagle closure.
4. Increase outreach efforts for park visitors and area pilots.

San Carlos Breeding Area
1. Extend closure a little further north.
2. Regularly post signs along closure fence.
3. Provide a sign directing OHV into the uplands and out of the floodplain.

Tonto Breeding Area
1. Post informative signs at Lake Roosevelt boat ramps.
2. Clearly mark buoys to specify no entry for watercraft.
3. Provide nestwatchers with an AGFD radio.

Tower Breeding Area
1. Post a closure sign at the beginning on FR 9705.

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APPENDIX A: 2005 ARIZONA BALD EAGLE WINTER COUNT RESULTS

Table 8. 2005 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	0	1	0	0
2	Little Colorado River (LCR)	15	0	0	0	0
3	S. Fork LCR – Campground	20	1	0	0	0
4	Casa Malapais – LCR	10	0	0	0	0
5	Greer Lakes (River, Bunch, and Tunnel Reservoirs)	45	1	0	0	0
6	Sponseller Lake	Not Surveyed				
7	Mexican Hay Lake	Not Surveyed				
8	White Mountain Hereford Ranch (Trinity, Glen Livet, McKay reservoirs)	60	3	0	0	0
9	The Ranch Lake	12	2	0	0	0
10	Ortega Lake	20	0	0	0	0
11	Concho Lake	20	2	0	0	0
12	Luna Lake	Not Surveyed				
13	Nelson Reservoir	Not Surveyed				
14	Nutrioso Reservoir	Not Surveyed				
15	Tenney Pond	Not Surveyed				
16	San Francisco River (Alpine RD to New Mexico	Not Surveyed				
17	Campbell Blue Creek	Not Surveyed				
Total		**217**	**9**	**1**	**0**	**0**
Cochise County						
18	Parker Canyon Lake	90	2	1	0	0
19	Willcox Playa	210	0	0	0	0
20	Sulphur Springs Valley – Whitewater Draw	--	0	0	0	0
Total		**300**	**2**	**1**	**0**	**0**
Coconino County						
21	Long Lake Complex	160	2	2	0	0
22	Stoneman Lake	120	0	1	0	0
23	FH-3	80	0	0	0	0
24	I-17, Section to Flagstaff	255	2	0	0	1
25	Bellemont	240	3	3	0	0
26	Townsend/Winona A/B	270	0	0	0	0
27	HWY 89 North /Sunset Crater – Wupatki	397	1	0	0	0
28	FH-3 Lakes (Mary, Mormon, Marshall, Prime	299	9	1	0	0
29	Continental Country Club Lakes	75	0	0	0	0
30	Chevelon Canyon Lakes	Not Surveyed				
31	Holden Lake	15	1	0	0	0
32	Spring Valley Wash	120	1	0	0	0
33	Red Lake Valley	35	1	0	0	0
34	Kaibab Lake	240	1	1	0	0
35	Pittman Valley	20	1	0	0	0
36	Davenport Lake	15	0	0	0	0
37	Scholz Lake	Not Surveyed				

Table 8. continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Coconino County (continued)						
38	Cataract Lake	60	1	1	0	0
39	Willow Springs Lake	Not Surveyed				
40	West Chevelon Canyon	124	0	0	0	0
41	Willow Creek	60	0	0	0	0
42	White Horse Lake – Pomeroy Tanks	Not Surveyed				
43	JD Dam Lake	Not Surveyed				
44	Barney Flat Wetland	42	0	0	0	0
45	Steel/Stone Road	90	0	0	0	0
46	Pine Flat	Not Surveyed				
47	Boggy Tank	140	1	0	0	0
48	Blue Stem Wash-Babbit property	Not Surveyed				
49	Glen Canyon Nat'l Rec. Area (Lee's Ferry	30	0	0	0	0
50	Colorado River, Lee's Ferry to Little Colorado River	Not Surveyed				
Total		**2887**	**24**	**9**	**0**	**1**
Grahm County						
51	Point of Pines Lake Area	300	12	9	0	0
Greenlee County						
52	Grey's Peak	61	0	0	0	0
Maricopa County						
53	Painted Rock Reservoir	Not Surveyed				
Mohave County						
54	Lake Mohave	420	3	5	0	4
55	Havasu National Wildlife Refuge, Topock Marsh	285	0	0	0	0
56	Lake Mead, Temple Bar	995	11	6	0	8
57	Alamo Lake	180	3	0	0	0
Total		**1880**	**17**	**11**	**0**	**12**
Navajo County						
58	Lake of the Woods	30	2	3	0	0
59	Rainbow Lake	75	3	3	0	0
60	Little Mormon Lake	20	0	0	0	0
61	Whipple Lake	21	0	0	0	0
62	Long Lake	--	0	0	1	0
63	Lone Pine Dam	60	0	0	0	0
64	Schoens Reservoir	60	2	0	0	0
65	White Mountain Lake	28	0	0	0	0
66	Dry Lake	90	0	0	0	0
67	Jacques Marsh	41	0	0	0	0
68	Scott's Reservoir	60	0	0	0	0
69	Showlow Lake	90	2	1	0	0
70	Pintail Lake	30	0	0	0	0
71	Telephone Lake	15	3	0	0	0
72	Fool Hollow Lake	105	1	0	0	0
73	Fred's Lake	20	0	0	0	0
74	Edeler's Lake	30	0	0	0	0
75	Cottonwood Wash/ Clay Springs	35	0	0	0	0
76	White Lake	15	0	0	0	0
Total		**825**	**13**	**7**	**1**	**0**

Table 8. continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Pima County						
77	Arivaca Lake	60	0	0	0	0
Pinal County						
78	Picacho Reservoir	45	0	0	0	0
Santa Cruz County						
79	Bog Hole	60	0	0	0	0
80	Patagonia	90	0	0	0	0
81	San Raphael Valley	60	0	0	0	0
82	Pena Blanca Lake	45	0	0	0	0
Totals		**255**	**0**	**0**	**0**	**0**
Yavapai County						
83	Wet Beaver Creek	300	0	1	0	0
84	Oak Creek	--	3	0	0	0
85	Willow Lake	240	2	0	0	0
86	Lynx Lake	240	1	0	0	0
87	Watson Lake	240	0	1	1	0
88	Goldwater Lake	240	1	0	0	0
Totals		**1260**	**7**	**2**	**1**	**0**
Yuma and La Paz Counties						
89	Imperial N.W.R. Cibola/Martinez Lake – Colorado River	130	0	1	0	0

Table 9. 2005 Arizona bald eagle winter count helicopter survey results.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
90	Verde River	107	21	1	0	0
91	Lower East Verde River	19	0	0	0	0
92	Lower West Clear Creek	16	1	0	0	0
93	Lower Salt River	124	17	7	0	0
94	Upper Salt River	76	4	0	0	0
95	Lower Tonto Creek	30	4	0	0	0
96	Lower Cherry Creek	4	0	0	0	0
97	Lower Canyon Creek	10	0	0	0	0
98	Lower Cibecue Creek	10	0	0	0	0
99	Lower Carrizo Creek	4	0	0	0	0
100	White River	15	0	0	0	0
101	North Fork White River	28	3	0	0	0
102	Lower Black River	39	4	0	0	0
103	Big and Little Bonito Creeks	27	0	1	0	0
104	San Carlos River - Talkalai Lake	20	5	0	0	0
105	San Carlos Reservoir	17	0	1	0	0
106	Upper and Lower Gila River	29	1	5	0	0
107	Eagle Creek	27	4	0	0	0
108	Bonita Creek	12	0	0	0	0
109	Lower San Francisco River	28	1	0	0	0
110	Blue River	10	0	0	0	0
111	Sunrise Lake	2	0	0	0	0
112	Big Lake	2	2	0	0	0
113	Lee Valley Reservoir	Not Surveyed				
114	Crescent Lake	1	1	0	0	0
115	Lake Pleasant	33	1	0	0	0
Totals		**690**	**69**	**15**	**0**	**0**

Table 10. 2005 Arizona bald eagle winter count non-standardized route results.

Route Name	County	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Lake Mohave	Mohave	200	1	1	0	0
F.S. RD. 124	Coconino	200	5	0	0	0
HWY 87 South (991)	Coconino	115	0	0	0	0
HWY 87 North (992)	Coconino	90	2	0	0	0
Camp Verde (993)	Yavapai	45	0	0	0	0
HWY 180 (994)	Coconino	210	1	0	0	0
Williams Ranch	Navajo	--	5	5	0	0
Callville Route	Mohave	150	1	0	0	0
Totals		**1010**	**15**	**6**	**0**	**0**

APPENDIX B: RAPTOR REPRODUCTIVE STATUS CRITERIA

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

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

a. Young were raised.
b. Eggs were laid.
c. One adult sitting low in the nest, presumably incubating.
d. Two adults present on or near the nest.
e. One adult and 1 bird in immature plumage at or near a nest, if 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: 2005 ARIZONA BALD EAGLE PRODUCTIVITY

Table 11. Arizona bald eagle breeding area productivity summary, 2005.

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Alamo	F	4	1/7-31	1+	Failed 1/31-2/28			
Bartlett	F	2	1/31-2/3	2+	2/3-3/18	2	Failed 5/9-6/1	
	One nestling last seen on 4/15 at 4 weeks old. Second nestling last seen on 5/9 at 7.5 weeks old.							
Becker	U							
Blue Point	S	10	<1/14	3	2/1-3/15	3	3	4/14-5/9
Box Bar*	S	3	<12/23	2+	1/30	1	1	4/22
Bulldog	S	1	<12/10	2+	2/1-17	2	2	5/2-9
Canyon	U							
Cedar Basin	U							
Cibecue	F	2	2/1-3/17	1+	3/17-4/14	1	Failed 4/14-5/9	
Cliff	U							
Coldwater	S	3	1/7-31	2+	1/31-3/18	2	2	>6/1
Coolidge*	O	2						
Crescent*	F	1	<4/14	1+	6/1	1+	Failed 6/1-10	
Doka	S	3	1/7-31	2+	1/31-3/18	2	2	3/18-4/15
Dupont	U							
East Verde	O	2						
Fort McDowell	F	16	1/7-31	1+	Failed 1/31-3/18			
	Nest tree washed away by floods.							
Granite Basin	U							
Granite Reef*	S	3	1/14-31	2	2/17-3/18	1	1	5/30
Horse Mesa	S	4	<1/14	1+	2/1-3/17	1	1	5/9-6/1
Horseshoe	F	11	1/7-31	1+	Failed 1/31-3/8			
Ive's Wash	S	3	1/7-31	1+	2/28-3/18	1	1	>5/15
Ladders*	S	3	1/31-2/17	2+	3/18-21	2	1	5/24
	First nestling pre-fledged on 5/24, flying on 6/3. Second nestling disappeared 6/3 at 9 weeks old.							
Lone Pine	S	5	2/1-3/17	1+	3/17-4/14	1	1	>6/1
Lower Lake Mary*	F	1	>5/22	1+	5/22-6/9	1	Failed 8/4	
Luna*	S	1		2+		2	2	5/27, 5/28
Lynx	S	2	<1/31	1+	1/30-2/16	1	1	>4/15
Needle Rock*	S	2	1/7-31	2+	2/25-3/18	2	1	9/14
	Both nestlings attacked by Africanized bees on 5/22. One died in rehab and second released 9/14.							
Oak Creek	F	2	1/31-2/10	1	Failed 4/15-5/9			
Orme*	S	6	1/14-1/31	2+	2/23	2	2	5/14, 5/16
Perkinsville	S	4	1/31-3/18	1+	3/18-4/15	1	1	>6/1
Pinal	S	7	1/14-2/1	2	2/1-3/17	2	2	5/9-6/1
Pinto*	S	6	<1/14	2+	2/15-3/3	2	2	5/13, 5/16
Pleasant*	F	2	<1/28	1+	Failed 1/28-2/4			
	F	2	2/26	1+	Failed 3/26			
Redmond	O	2						
Rock Creek	S	2	2/1-3/17	1+	3/17-4/14	1	1	>6/1

[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
Rodeo	F	2	1/7-1/31	2+	1/31-3/18	2	Failed 5/7	
	New male enters pair midseason. Nest and 2 8-week old nestlings fell 4/15-5/7.							
San Carlos*	S	3	1/14-2/1	1+	2/27	1	1	5/22-6/14
76	U							
Sheep	S	4	<1/14	2+	2/1-3/17	2	2	5/9-6/1
Suicide	S	2	1/14-2/1	3	2/1-3/17	3	3	5/22-6/14
Sycamore	S	4	<1/3	2+	1/7-31	2	2	3/18-4/15
Table Mountain	F	4	2/1-3/18	1	Failed 3/18-4/15			
Talkalai	S	7	1/14-2/1	1+	2/1-3/18	1	1	5/22-6/14
Tonto*	S	4	1/14-2/1	1+	2/27	1	1	5/19
Tower*	S	8	<1/31	2+	2/27	2	1	5/15-5/28
	Second nestling disappeared between 5/15-28 at 10 weeks old.							
Winkelman	U							

[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 winter count, ORA, and Nest Survey Flights.

Location	Time	Comments
January 5, 2005		
Cibecue	1048	All known nests empty. No bald eagles.
Mule Hoof historical BA	1102	All known nests empty. No bald eagles.
Cedar Basin	1119	All known nests empty. No bald eagles.
Lone Pine	1135	All known nests empty. No bald eagles.
Crescent	1234	One adult in area. Nest #1 full of snow.
January 6, 2005		
Willow nest site	0939	No new nests or bald eagles.
Eagle nest site	1008	No new nests. One adult in area.
January 7, 2005		
Rodeo	0813	Two adults building on a new small nest structure north of Highway 87.
Sycamore	0820	One adult incubating in nest #4.
Doka	0824	Nest snag #2 fell. No adults in area.
Fort McDowell	0827	All known nests empty. Two adults in area.
Box Bar	0833	One adult incubating in nest #3. Second adult in area.
Needle Rock	0834	One adult perched in nest #2. Second adult in area.
Bartlett	0837	All known nests empty. One adult in area.
Yellow Cliffs	0855	Two small nests found. No bald eagles.
Cliff	0907	All known nests empty. Four adults in area.
Horseshoe	0928	All known nests empty. No bald eagles.
Table Mountain	0940	All known nests empty. Two adults in area.
East Verde	1016	One adult perched at nest #6. Second adult in area.
Coldwater	1025	All known nests empty. One adult in area.
Ladders	1031	All known nests empty. Two adults in area.
Pleasant	1300	All known nests empty. No bald eagles.
January 14, 2005		
Granite Reef	0815	One adult standing in nest #3.
Orme	0817	One adult standing in nest #6. Second adult in area.
Bull Dog	0829	One adult incubating in nest #1.
Blue Point	0834	One adult incubating in nest #10. Second adult in area.
Canyon Lake	0844	One subadult bald eagle in area.
Horse Mesa	0905	One adult incubating in nest #4.
Rock Creek	0916	All known nests empty. No bald eagles.
Tonto	0935	New nest #4 found. Two adults in area.
Sheep	0943	One adult incubating in nest #4.
76	1002	All known nests empty. One adult in area.
Dupont	1023	All known nests empty. No bald eagles.
Pinto	1235	One adult incubating in nest #6. Second adult in area.
Pinal	1243	All known nests empty. Two adults in area.
Redmond	1253	All known nests empty. Two adults in area.
Canyon	1340	All known nests empty. No bald eagles.
Talkalai	1414	One adult standing in nest #7. Second adult in area.
San Carlos	1427	Nest #3 with new construction. Three adults in area.
Suicide	1444	All known nests empty. One adult in area.
Coolidge	1450	All known nests empty. Two subadults in area.
January 31, 2005		
Granite Reef	0826	One adult incubating in nest #3. Second adult in area.
Orme	0827	One adult incubating in nest #6. Second adult in area.
Rodeo	0830	One adult incubating in nest #2. Second adult in area.

Table 12. continued.

Location	Time	Comments
January 31, 2005 continued.		
Sycamore	0833	One adult brooding 2 1-week old nestlings.
Doka	0836	One adult incubating in new nest #3. Second adult in area.
Fort McDowell	0838	One adult incubating in nest #16. Second adult in area.
Box Bar	0843	One adult incubating in nest. Second adult in area.
Needle Rock	0845	One adult incubating in nest. Second adult in area.
Bartlett	0847	Nest #2 with new construction. Two adults in area.
Yellow Cliffs	0851	No new nests or bald eagles.
Cliff	0910	All known nests empty. Two adults and 4 subadults in area.
Horseshoe	0927	One adult incubating in nest #11.
Table Mountain	0939	All known nests empty. No bald eagles.
East Verde	1021	One adult standing in nest #6. Second adult in area.
Coldwater	1030	One adult incubating in nest #3. Second adult in area. Nest #3 exists, nest #4 fallen.
Ladders	1036	All known nests empty. One adult in area.
Camp Verde history BA	1043	No new nests or bald eagles.
Oak Creek	1100	Nest #1 tree fallen. All known nests empty. One adult in area.
Tower	1308	One adult incubating in nest #8.
Perkinsville	1316	All known nests empty. No bald eagles.
Hell Point historical BA	1335	All known nests empty. Two adult and 3 subadult bald eagles. Two golden eagles in area.
Muldoon nest site	1340	All known nests empty. Three adult and 2 subadult bald eagles.
Granite nest site	1341	All known nests empty. No bald eagles.
Sullivan nest site	1343	All known nests empty. No bald eagles.
Lynx	1401	One adult incubating in nest #2.
Devil's Post historical BA	1510	All known nests empty. No bald eagles.
Chino historical BA	1539	No new nests or bald eagles.
Alamo	1543	One adult incubating in nest #4.
Ive's Wash	1550	One adult incubating in nest #3.
February 1, 2005		
Bulldog	0745	One adult incubating in nest.
Blue Point	0748	One adult incubating/brooding in nest.
Horse Mesa	0801	One adult incubating in nest.
Rock Creek	0805	Nest #2 full of snow. No bald eagles.
Tonto	0810	One adult incubating in nest #4.
Sheep	0815	One adult incubating in nest. Two adults in area.
76	0826	All known nests empty. One adult in area.
Dupont	0842	All known nests empty. No bald eagles.
Pinto	0851	One adult incubating in nest. Second adult in area.
Pinal	0856	One adult flushed from nest #7 with 2 eggs. Second adult in area.
Redmond	0901	Nest #5 with new construction. Two adults in area.
Canyon	0916	All known nests empty. No bald eagles.
Cibecue	1038	All known nests empty. No bald eagles.
Mule Hoof historical BA	1046	All known nests empty. No bald eagles.
Cedar Basin	1100	All known nests empty. No bald eagles.
Lone Pine	1115	All known nests empty. One adult bald eagle in area.
Talkalai	1309	One adult incubating in nest #7.
San Carlos	1313	One adult incubating in nest #3.
Cottonwood Wash	1319	One new large nest #1 in cottonwood tree east of San Carlos Reservoir.
Suicide	1320	One adult incubating in nest #2.

Table 12. continued.

Location	Time	Comments
February 1, 2005 continued		
Coolidge	1330	All known nests empty. One subadult bald eagle.
Granite Basin	1335	All known nests empty. No bald eagles.
Winkelman	1345	All known nests empty. No bald eagles.
March 17, 2005		
Bulldog	0742	One adult on nest with 2 3-week old nestlings.
Blue Point	0746	One adult on nest with 3 4-week old nestlings.
Horse Mesa	0758	One adult on nest with 1 3-week old nestling.
Rock Creek	0803	One adult incubating in new pine snag nest #3.
Tonto	0810	One adult brooding 1 2.5-week old nestling. Second adult in area.
Sheep	0813	One 3-week old nestling in nest. One adult perched in area. Nest #1 tree snag fallen.
76	0825	All known nests empty. One adult in area.
Dupont	0840	All known nests empty. No bald eagles. Searched Solome Creek.
Pinto	0855	Two 3-week old nestlings in nest. One adult in area.
Pinal	0857	One adult incubating/brooding 1+ nestling.
Redmond	0904	All known nests empty. Two adults in area.
Canyon	0915	All known nests empty. No bald eagles.
Cibecue	1036	One adult incubating in nest #2.
Mule Hoof historical BA	1038	All known nests empty. No bald eagles.
Cedar Basin	1052	All known nests empty. No bald eagles.
Lone Pine	1058	One adult incubating in nest #5.
Talkalai	1310	One adult brooding 1 nestling.
San Carlos	1314	One adult brooding 1 2.5-week old nestling. Second adult in area.
Suicide	1320	One adult at nest with 3 3-week old nestlings.
Coolidge	1323	All known nests empty. No bald eagles.
Granite Basin	1355	All known nests empty. No bald eagles.
March 18, 2005		
Granite Reef	0821	One adult standing in nest with 1 2-week old nestling and 1 egg. Second adult in area.
Orme	0822	One adult flying to nest with 2 3-week old nestlings. Second adult flying in area.
Rodeo	0825	One adult standing in nest with 1 2.5-week nestling.
Sycamore	0829	One adult standing in nest with 2 9-week old nestlings.
Doka	0833	One adult standing in nest with 2 9-week old nestlings. Second adult in area.
Fort McDowell	0840	Nest #16 washed away in floods. One adult in area.
Box Bar	0843	One 7-week old nestling in nest. One adult perched in nest tree.
Needle Rock	0846	One adult brooding 2 2.5-week old nestlings.
Bartlett	0850	One adult brooding 2 1.5-week old nestlings.
Cliff	0905	All known nests empty. Two adult and 9 subadult bald eagles in area.
Horseshoe	0919	Nest empty. No adults in area.
Table Mountain	0932	One adult standing in nest #4 with 1 egg.
LF nest site	0954	No new nests or bald eagles.
East Verde	1045	Nest #6 with new construction. Two adults in area.
Fossil Creek	1054	One adult at confluence with Verde River.
Coldwater	1057	One adult incubating/brooding in nest.
Ladders	1104	One adult incubating in nest #3.
Camp Verde historical BA	1113	No new nests or bald eagles.

Table 12. continued.

Location	Time	Comments
March 18, 2005 continued		
Oak Creek	1130	One adult incubating in nest #2. Second adult at confluence with the Verde River.
Pecks Lake	1140	No new nests or bald eagles.
Dead Horse State Park	1145	No new nests or bald eagles.
Tower	1153	One adult standing in nest with 1 3-week old nestling. Second adult flying in area with a fish.
Perkinsville	1200	One adult incubating in nest #4.
Hell Point historical BA	1215	All known nests empty. No bald eagles.
Muldoon nest site	1223	All known nests empty. No bald eagles.
Sullivan Lake nest site	1230	All known nests empty. No bald eagles.
Lynx	1415	One 7-week old nestling in nest. Two adults at lake.
Chino historical BA	1458	No new nests or bald eagles.
Alamo	1502	All known nests empty. No bald eagles.
Ive's Wash	1508	One adult brooding 1 1-week old nestling.
April 14, 2005		
Bulldog	0735	Two 7-week old nestlings in nest.
Blue Point	0738	Three 8-week old nestlings in nest.
Canyon lake	0745	No new nests or bald eagles.
Horse Mesa	0752	One 7-week old nestling in nest.
Rock Creek	0755	One adult in nest with 1 3-week old nestling.
Tonto	0800	One adult in nest with 1 6.5-week old nestling.
Sheep	0805	One adult in nest with 2 7-week old nestlings.
76	0815	One adult standing in nest #4.
Dupont	0826	All known nests empty. No bald eagles. Search Solome Creek to Roosevelt Lake.
Pinto	0840	Two 7-week old nestlings.
Pinal	0848	Two 5-week old nestlings.
Redmond	0855	All known nests empty. No bald eagles.
Canyon	0915	All known nests empty. No bald eagles.
Cibecue	1050	One adult brooding in nest #2.
Mule Hoof historical BA	1055	All known nests empty. No bald eagles.
Cedar Basin	1100	All known nests empty. No bald eagles.
Lone Pine	1108	One adult brooding in nest #5.
Crescent	1135	One adult incubating in nest #1.
Chevelon Canyon nest site	1305	No new nests or bald eagles.
Willow Springs Lake nest site	1320	All known nests empty. No bald eagles. One osprey in area.
Woods Canyon Lake nest site	1325	All known nests empty. No bald eagles. Two ospreys in area.
Bear Canyon Lake	1340	No new nests or bald eagles.
Knoll Lake nest site	1345	All known nests empty. No bald eagles.
April 15, 2005		
Granite Reef	0724	One 6-week old nestling in nest. Two adults in area.
Orme	0725	Two 7-week old nestlings in nest. One adult in area.
Rodeo	0728	One adult perched in nest tree with 2 6.5-week old nestlings.
Sycamore	0732	Two fledglings in area.
Doka	0736	One 13-week old nestling in nest. Two adults and second fledgling in area.
Fort McDowell	0741	One adult perched in nest #15. Second adult in area.
Box Bar	0746	One 11-week old nestling in nest. One adult in area.

Table 12. continued.

Location	Time	Comments
April 15, 2005 continued.		
Needle Rock	0747	Two 6.5-week old nestlings in nest.
Bartlett	0753	Two 4-week old nestling in nest. Two adults in area.
Yellow Cliffs	0805	One new, large, recently used nest #1 found east of Yellow Cliffs. One adult in area.
Cliff	0828	All known nests empty. One adult and 3 subadults bald eagles in area.
Horseshoe	0900	All known nests empty. No bald eagles.
Table Mountain	0919	All known nests empty. No bald eagles.
East Verde	0929	All known nests empty. One subadult in area.
Coldwater	0946	Two 4-week old nestlings in nest. No adults in area.
Ladders	0953	One adult brooding 2 2-week old nestlings in nest.
West Clear Creek	0958	No new nests or bald eagles.
Camp Verde historical BA	1105	No new nests or bald eagles.
Oak Creek	1113	One adult incubating 1 egg.
Tower	1128	One adult at nest with 2 6-week old nestlings.
Perkinsville	1136	One 4.5-week old nestling.
Hell Point historical BA	1158	All known nests empty. One adult and 1 subadult in area.
Muldoon nest site	1205	All known nests empty. No bald eagles.
Granite nest site	1208	One golden eagle standing in nest #1.
Sullivan nestsite	1214	All known nests empty. No bald eagles.
Lynx	1412	One 11-week old juvenile in nest.
Devil's Post historical BA	1454	All known nests empty. No bald eagles.
Chino historical BA	1105	No new nests or bald eagles.
Alamo	1515	All known nests empty. No bald eagles.
Ive's Wash	1525	One 6-week old nestling.
Salt/Gila River Confluence	1634	No new nests or bald eagles. Surveyed river from Hwy 85 to Sewage Ponds at 27th Avenue and Lower Buckeye Road.
April 21, 2005		
Ive's Wash	0815	One 7-week old nestling in nest. Two adults in area.
Planet Ranch	1010	Two subadult bald eagles in area.
Gene Wash nest site	1035	All known nests empty. No bald eagles.
Fossil Creek	1235	One new golden eagle nest #1.
West Clear Creek	1345	One golden eagle incubating in new nest #1.
Blue Ridge Reservoir	1355	One osprey at well maintained nest #1.
East Clear Creek	1420	No new nests or bald eagles.
Little Colorado	1437	No new nests or bald eagles.
Dupont	1520	Two large new cliff nests.
May 9, 2005		
Bartlett	0725	One 7.5-week old nestling. Second nestling missing.
Fort McDowell	0735	One adult in area.
Doka	0740	One adult in area.
Rodeo	0755	Nest #2 partially fallen. No nestlings in area.
Bulldog	0800	Nest empty. No adults or juveniles in area.
Blue Point	0805	Nest empty. No adults or juveniles in area.
Horse Mesa	0812	One 11-week old nestling in nest.
Rock Creek	0818	One 7-week old nestling in nest. One adult in area.
Tonto	0828	One 10-week old nestling in nest. One adult in area.
Sheep	0830	Two 10.5-week old nestlings in nest. One adult in area.
Pinal	0844	Two 8.5-week old nestlings in nest.
Redmond	0849	All known nests empty. No bald eagles.
Cibecue	1020	All known nests empty. No bald eagles.
Lone Pine	1045	One 4.5-week old nestling in nest. Two adults in area.

Table 12. continued.

Location	Time	Comments
May 9, 2005 continued		
Woods Canyon Lake nest site	1330	One osprey standing in nest #3.
Oak Creek	1531	All known nests empty. One adult in area.
Coldwater	1546	Two 7.5-week old nestlings in nest. One adult in area.
Pleasant	1605	All known nests empty. No bald eagles.
June 1, 2005		
Bartlett	0740	Nest empty. No juveniles in area. One adult in area.
Coldwater	0819	Two 10.5-week old nestlings in nest. One adult in area.
Tower	0836	One fledgling in area.
Perkinsville	0849	One 12-week old nestling in nest.
Lone Pine	1115	One 8-week old nestling in nest.
Pinal	1135	Two fledglings in area.
Sheep	1155	Nest empty. No fledglings or adults in area.
Rock Creek	1203	One 10.5-week old nestling in nest.
Horse Mesa	1205	Nest empty. No fledglings in area. Two adults at lake.
Blue Point	1224	Two fledglings at Willow Springs Cove.
Bull Dog	1230	Nest empty. No bald eagles in area.

APPENDIX E: BOX BAR BREEDING AREA SUMMARY

Table 13. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2005.

Human Activity	N[1]	W	R	B	Total	Percent
Helicopters	9	12	1	1	23	39.7
Campers	17	--	--	--	17	29.3
Gunfire	5	3	--	--	8	13.8
Small planes	2	3	--	--	5	8.6
Ultralights	1	1	1	--	3	5.2
OHVs	2	--	--	--	2	3.4
Total	36	19	2	1	58	

[1]Bald eagle behavior, N=none, W=watched, R=restless, B=not in area.

Table 14. Observed forage event and success, Box Bar BA, Arizona, 2005.

Sex	Fish		Birds		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	16	13-3	1	1-0	1	1-0	19	12-7	37	27-10
Female	4	3-1	1	1-0	--	--	3	2-1	8	6-2
Unknown	4	4-0	--	--	--	--	--	--	4	4-0
Total	24	20-4	2	2-0	1	1-0	22	14-8	49	37-12

[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, 2005.

Sex	Fish	Mammals	Birds	Unknown	Total	Percent
Male	30	4	1	27	62	78.5
Female	5	--	--	6	11	13.9
Unknown	3	1	--	2	6	7.6
Total	38	5	1	35	79	
Percent	48.1	6.3	1.3	44.3		

Table 16. Bald eagle habitat analysis at the Box Bar BA, Arizona, 2005.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
22.3	ST	Right	No	1	RU	UP
23.1	BO	Left	No	2	RU	UP
23.2a	SS	Left	No	1	RU	UP
23.2b	PV	Left	No	1	RU	UP
23.2c	BO	Left	No	1	RU	UP
24.0a	CT	Left	No	1	RU	UP
24.0b	ST	Left	No	1	RU	CW
24.0c	ST	Right	No	1	RU	UP
24.1	MS	Right	No	1	RU	MB
24.2a	MS	Right	No	1	RB	MB
24.2b	BA	Right	No	1	RB	MB
24.2c	WO	Left	No	1	RB	WT
24.4	MS	Right	No	1	RU	MB
24.6a	ST	Left	No	1	RU	CW
24.6b	WO	Left	No	1	RU	WT
24.6c	CM	Left	Yes	1	RU	CW
24.8a	MS	Right	No	1	RI	FL
24.8b	CS	Left	Partial	1	RU	CW
24.8c	SS	Island	No	1	RU	WT
24.8d	DS	Left	No	1	RU	CW
24.8e	SS	Left	No	1	RI	WT
24.9a	CL	Left	Partial	6	RU	CW
24.9b	DS	Left	Yes	1	RU	CW
24.9c	ST	Left	No	1	RU	MB
25.0a	ST	Left	No	6	RU	MB
25.0b	SP	Left	No	1	RU	MB
25.0c	SG	Left	No	1	RU	MB
25.0d	MS	Left	No	1	RU	MB
25.0e	SS	Left	No	1	RU	MB

[1]River kilometers (Hunt et. al. 1992).
[2]ST=snag top, BO=boulder, SS=snag shrub, PV=palo verde, CT=cliff top, MS=mesquite, BA=cut bank, WO=willow, CM=cottonwood medium/10-20m, CS=cottonwood small/0-10m, DS=deciduous small/0-5m, CL=cottonwood large/20-30+m, SG=soft 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]RU=run, RB=river bend, RI=riffle.
[5]UP=desert upland, CW=cottonwood grove, MB=mesquite bosque, WT=willow thicket, FL=farmland.

Table 17. Bald eagle habitat use at the Box Bar BA, Arizona, 2005.

River km	PH[1,2]	PK	PP	ET	CL	PV	Total	Percent
22.3	28	--	15	--	--	--	43	0.2
23.1	62	--	--	--	--	--	62	0.3
23.2a	67	--	--	--	--	--	67	0.3
23.2b	3,077	--	34	--	137	1	3,249	15.1
23.2c	67	--	--	--	--	--	67	0.3
24.0a	32	--	--	--	--	--	32	0.1
24.0c	67	--	--	--	--	--	67	0.3
24.1	14	--	--	--	--	--	14	0.1
24.2a	1,147	--	--	--	20	--	1,167	5.4
24.2b	23	--	--	--	--	--	23	0.1
24.4	48	--	--	--	--	--	48	0.2
24.6a	52	--	14	2	--	--	68	0.3
24.6b	205	--	--	--	--	--	205	1.0
24.6c	232	--	--	7	--	--	239	1.1
24.8a	46	--	--	--	--	--	46	0.2
24.8d	16	--	--	--	--	--	16	0.1
24.8e	31	--	--	--	--	--	31	0.1
24.9a	12,616	--	71	6	370	63	13,126	60.9
24.9c	136	--	--	--	--	30	166	0.8
25.0a	31	--	--	--	--	--	31	0.1
25.0b	132	--	--	--	--	--	132	0.6
25.0c	2,443	17	165	16	4	12	2,657	12.3
Total	20,572	17	299	31	531	106	21,556	
Percent	95.4	0.1	1.4	0.1	2.5	0.5		

[1]Observation Time (minutes).
[2]PH=perched hunting, PK=perched with prey, PP=perched preening, ET=eating in tree, CL=perched close to mate, PV=perched vocalizing.

APPENDIX F: COOLIDGE BREEDING AREA SUMMARY

Table 18. Bald eagle habitat analysis at the Coolidge BA, Arizona, 2005.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
23.2	CT	Left	No	3	PO	CL
24.7a	SG	Left	No	1	PO	CW
24.7b	LG	Right	No	1	RI	CW
24.7c	CF	Left	Partial	1	PO	CL
24.8a	SG	Left	No	1	PO	CW
24.8b	FT	Right	No	1	PO	TX
24.8c	CM	Left	No	1	RI	CW
24.9a	CM	Left	No	1	RI	CW
24.9b	SG	Left	No	1	RI	CW
24.9c	SG	Left	No	1	RI	CW
25.0a	CL	Left	Partial	1	RI	CW
25.0b	CM	Left	No	2	RI	CW
25.0c	CM	Left	No	1	RI	CW
25.1a	CM	Left	No	2	RI	CW
25.1b	CL	Left	Partial	1	PO	CW
25.1c	CF	Right	No	1	PO	CL
25.1d	SG	Left	No	1	PO	CW
25.2a	CT	Right	No	1	PO	UP
25.2b	CL	Left	Partial	2	PO	CW
25.2c	CM	Left	No	1	PO	CW
25.2d	WO	Left	Yes	2	PO	CW
25.3a	SG	Left	No	3	PO	CW
25.3b	SG	Left	No	4	PO	CW
25.4	CM	Left	Partial	2	PO	MB
25.5a	CM	Left	No	1	PO	MB
25.5b	SH	Left	No	8	PO	UP
27.7	PT	Right	No	1	PO	MB
27.9	PT	Right	No	1	PO	MB
28.2	RI	Left	No	3	PO	UP
28.3	RI	Left	No	5	PO	UP
28.4a	BO	Left	No	1	PO	TX
28.4b	SO	Right	No	1	PO	TX
28.4c	SG	Right	No	1	RI	TX
28.4d	SG	Left	No	1	RI	TX
28.5	SG	Right	No	1	RI	TX
28.7a	SG	Right	No	1	RI	WT
28.7b	CF	Right	No	2	PO	CL
28.7c	CF	Right	No	5	PO	UP
29.1	RI	Left	No	6	PO	UP
29.4	CF	Left	Partial	5	PO	UP
29.6	RI	Left	No	6	PO	UP

[1]River kilometers (Hunt et. al. 1992).
[2]CT=cliff top, SG=soft snag, LG=log, CF=cliff ledge, FT=fallen tree, CM=cottonwood medium/10-20m, CL=cottonwood large/20-30+m, WO=willow, SH=hard snag, PT=pinnacle top, RI=ridge, BO=boulder, SO=shore.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]PO=pool, RI=riffle.
[5]CL=cliff, CW=cottonwood grove, TX=tamarix, UP=upland desert, MB=mesquite bosque, WT=willow thicket.

Table 19. Bald eagle habitat use at Coolidge BA, Arizona, 2005.

River km	PW[1,2]	PP	CL	SH	GN	PV	PU	ES	BG	Total	Percent
23.2	69	2	--	--	--	--	--	--	--	71	1.0
24.7	109	2	--	--	--	--	--	--	--	111	1.6
24.8	563	22	--	10	--	1	--	10	--	606	8.9
24.9	695	13	104	--	--	5	--	4	9	830	12.2
25.0	4	--	--	--	6	55	44	--	--	109	1.6
25.1	43	--	--	--	1	--	39	--	--	83	1.2
25.2	1,132	37	--	--	--	64	83	--	--	1,316	19.4
25.3	1,675	124	229	--	--	18	--	--	--	2,046	30.1
25.4	9	--	--	--	--	--	--	--	--	9	0.1
25.5	136	--	--	--	--	--	--	--	--	136	2.0
27.8	308	5	--	--	--	--	--	--	--	313	4.6
28.2	47	--	--	--	--	--	--	--	--	47	0.7
28.3	4	--	--	--	--	--	--	--	--	4	0.1
28.4	648	15	--	--	--	--	--	31	--	694	10.2
28.5	181	6	--	--	--	--	--	--	--	187	2.8
28.7	187	6	--	--	--	--	--	--	--	193	2.8
29.1	26	--	--	--	--	--	--	--	--	26	0.4
29.4	18	1	--	--	--	--	--	--	--	19	0.3
Total	5,854	233	333	10	7	143	166	45	9	6,800	
Percent	86.1	3.4	4.9	0.1	0.1	2.1	2.4	0.7	0.1		

[1]Observation Time (minutes).

[2]PW=perched watching, PP=perched preening, CL=perched close to mate, SH=standing on shore, GN=gathering nest material, PV=perched vocalizing, PU=perched unknown, ES=eating on shore, basking with wings out.

APPENDIX G: LADDERS BREEDING AREA SUMMARY

Table 20. Observed human activity and bald eagle behavior, Ladders BA, 2005									
Human Activity	N[1]	W	R	F	X	U	B	Total	Percent
Canoes/Kayaks	46	23	1	2	--	7	2	81	58.3
Small Planes	20	8	--	--	--	4	4	36	25.9
Helicopters	3	7	--	--	1	2	1	14	10.1
Rafters	3	--	--	--	--	--	--	3	2.2
Ranchers	1	1	--	--	--	--	--	2	1.4
Dogs	2	--	--	--	--	--	--	2	1.4
Hikers	1	--	--	--	--	--	--	1	0.7
Total	76	39	1	2	1	13	7	139	

[1]Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, X=mantle the nestlings, U=unknown, B=birds not in area

Table 21. Observed forage event and success, Ladders BA, Arizona, 2005								
Sex	Fish		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	4	4-0	1	0-1	--	--	5	4-1
Female	6	4-2	--	--	1	0-1	7	4-3
Total	10	8-2	1	0-1	1	0-1	12	8-4

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

Table 22. Observed prey types delivered to the nest, Ladders BA, Arizona 2005.						
Sex	Fish	Mammals	Reptiles	Unknown	Total	Percent
Male	33	3	1	8	45	78.9
Female	9	--	--	1	10	17.5
Unknown	--	--	--	2	2	3.5
Total	42	3	1	11	57	
Percent	73.7	5.3	1.8	19.3		

Table 23. Observed prey items delivered to the nest, Ladders BA, Arizona, 2005.						
Sex	Fish			Mammals	Total	Percent
	SU[1]	CS	CC	RS		
Male	8	5	1	2	16	78.9
Female	1	1	1	--	3	15.8
Total	9	6	2	2	19	
Percent	47.4	31.6	10.5	10.5		

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

Table 24. Bald eagle habitat analysis at the Ladders BA, Arizona 2005.

Perch Location[1]	Perch Type[2]	Side	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
157.2	SG	Right	2	RI	UP
157.7a	SG	Left	1	PO	UP
157.7b	CT	Left	1	PO	UP
158.4	SP	Right	2	PO	UP
161.0	SJ	Left	1	PO	UP
161.2	JN	Right	1	RI	UP
161.3	CF	Right	1	RI	CL
161.4a	CF	Right	1	PO	CL
161.4b	CF	Right	2	PO	CL
161.5	CT	Right	1	PO	UP
161.7	SG	Right	3	RI	UP
161.9a	BO	Right	1	PO	UP
161.9b	SG	Right	2	PO	UP
162.0a	ID	Channel	1	PO	--
162.0b	SO	Left	1	PO	WT
162.0c	CF	Right	1	PO	CL
162.0d	SJ	Right	1	PO	UP
162.0e	SG	Right	2	RB	UP
162.0f	RI	Left	5	--	UP
162.0g	CF	Left	6	--	CL
162.1a	JN	Right	1	RI	UP
162.1b	CF	Right	1	RI	CL
162.1c	SJ	Right	2	RI	UP
162.1d	SG	Right	2	RI	UP
162.1e	SJ	Right	2	RB	UP
162.1f	CF	Right	2	RB	CL
162.1g	CT	Right	2	RB	UP
162.2a	CF	Right	1	RI	UP
162.2b	SJ	Right	2	RI	UP
162.2c	SJ	Right	3	RB	UP
162.3	SJ	Right	2	PO	UP
162.4a	BO	Right	1	RI	WT
162.4b	BO	Right	1	RI	WT
162.4c	SG	Right	2	RI	UP
162.4d	SP	Right	2	RI	UP
162.4e	JN	Right	2	RI	UP
162.4f	CF	Right	2	RI	UP
162.5a	SG	Right	2	RI	UP
162.5n	SP	Right	2	RI	UP
162.5c	JN	Right	2	RI	UP
162.5d	SP	Right	2	RU	UP
162.5e	JN	Right	2	RU	UP
162.6	SB	Right	1	PO	WT
162.7a	BO	Left	1	RI	WT

[1]River kilometer (Hunt et. al. 1992).
[2]SG=snag, CT=cliff top, SP=stump, SJ=juniper snag, JN=juniper, CF=cliff, BO=boulder, ID=island, SO=shore, RI=ridge, SB=sand bar, BA=cut bank.
[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, PO=pool, RB=river bend, RU=run.
[5]UP=desert upland, CL=cliff, WT=willow thicket.

Table 24. continued.

Perch Location[1]	Perch Type[2]	Side	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
162.7b	SG	Right	1	RU	WT
162.8a	SB	Right	1	PO	WT
162.8b	BO	Channel	1	RI	WT
162.8b	BO	Channel	1	RI	WT
162.8c	BO	Channel	1	PO	WT
162.8d	SO	Right	1	RU	WT
162.8e	BO	Right	1	PO	WT
162.8f	SJ	Left	2	PO	UP
162.8g	BO	Left	2	RU	UP
162.8h	CT	Right	2	RU	UP
162.8i	BO	Right	3	PO	UP
162.8j	CT	Left	3	RU	UP
162.9a	SB	Right	1	PO	WT
162.9b	BO	Right	1	PO	WT
162.9c	BO	Left	1	PO	WT
162.9d	SO	Right	1	PO	WT
162.9e	BO	Right	1	PO	WT
162.9f	BO	Left	1	PO	UP
162.9g	BO	Left	2	PO	UP
162.9h	JN	Right	2	PO	UP
162.9i	CF	Left	2	PO	CL
162.9j	CF	Right	2	PO	CL
162.9k	CF	Right	2	PO	CL
162.9l	SG	Left	3	PO	CL
162.9m	RI	Left	3	PO	UP
162.9n	JN	Left	3	PO	UP
162.9o	SP	Left	3	PO	UP
162.9p	CF	Left	3	PO	CL
162.9q	CT	Left	3	PO	UP
162.9r	CT	Right	2	PO	UP
163.0a	SO	Left	1	PO	WT
163.0b	BA	Left	1	PO	WT
163.0c	CF	Left	1	PO	UP
163.0d	CF	Left	2	PO	CL
163.0e	CT	Left	2	PO	UP
163.0f	JN	Right	3	PO	UP
163.0g	JN	Left	3	PO	UP
163.0h	CT	Left	3	PO	UP
163.1a	BO	Left	1	PO	WT
163.1b	BO	Right	1	PO	WT
163.1c	SO	Left	1	PO	WT
163.1d	SO	Left	1	PO	--
163.1e	CF	Right	1	PO	CL

[1]River kilometer (Hunt et. al. 1992).
[2]SG=snag, CT=cliff top, SP=stump, SJ=juniper snag, JN=juniper, CF=cliff, BO=boulder, ID=island, SO=shore, RI=ridge, SB=sand bar, BA=cut bank.
[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, PO=pool, RB=river bend, RU=run.
[5]UP=desert upland, CL=cliff, WT=willow thicket.

Table 24. continued.

Perch Location[1]	Perch Type[2]	Side	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
163.1f	CF	Left	1	PO	CL
163.1g	JN	Left	1	PO	UP
163.1h	CT	Left	1	PO	UP
163.1i	BO	Left	2	PO	UP
163.1j	CT	Left	2	PO	UP
163.1k	JN	Left	3	PO	UP
163.2a	BO	Left	1	PO	--
163.2b	SO	Left	1	PO	--
163.2c	CF	Left	1	PO	CL
163.4a	CF	Left	1	PO	CL
163.4b	CF	Right	2	PO	CL
163.4c	CT	Right	2	PO	UP
163.4d	BO	Left	3	PO	UP
163.5a	JN	Left	1	PO	UP
163.5b	JN	Left	2	PO	UP
163.5c	BO	Right	2	PO	CL
163.5d	CF	Right	2	PO	CL
163.5e	CT	Right	2	PO	UP
163.5f	BO	Left	3	PO	UP
163.5g	CF	Right	3	PO	CL
163.5h	CF	Left	3	PO	CL
163.5i	CT	Right	3	PO	UP
163.6a	SP	Left	3	PO	UP
163.6b	SG	Left	3	PO	UP
163.6c	CF	Left	3	PO	UP
163.7a	CF	Left	2	PO	CL
163.7b	CT	Right	2	RB	UP
163.7c	CT	Left	3	PO	CL
163.8	CT	Right	2	PO	UP
163.9	CF	Left	2	RU	CL

[1]River kilometer (Hunt et. al. 1992).
[2]SG=snag, CT=cliff top, SP=stump, SJ=juniper snag, JN=juniper, CF=cliff, BO=boulder, ID=island, SO=shore, RI=ridge, SB=sand bar, BA=cut bank.
[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, PO=pool, RB=river bend, RU=run.
[5]UP=desert upland, CL=cliff, WT=willow thicket.

Table 25. Bald eagle habitat use at the Ladders BA, Arizona, 2005.

River km	PH[1,2]	PU	PP	PV	SH	CL	PK	EC	SS	ES	Total	Percent
161.2	54	--	--	--	--	--	--	--	--	--	54	0.5
161.3	48	--	--	--	--	--	--	--	--	--	48	0.5
161.4	146	--	12	--	--	--	--	--	--	--	158	1.5
161.5	3	--	--	--	--	--	--	--	--	--	3	0.0
161.7	21	--	--	--	--	--	--	--	--	--	21	0.2
161.9	64	--	--	--	--	--	1	--	--	--	65	0.6
162.0	98	61	4	--	7	--	7	9	7	--	193	1.9
162.1	213	631	50	1	--	--	--	--	--	--	895	8.8
162.2	253	985	41	--	--	65	--	--	--	--	1,344	13.2
162.3	4	--	--	--	--	--	--	--	--	--	4	0.0
162.4	18	125	31	--	17	1	--	--	--	--	192	1.9
162.5	378	--	22	--	--	--	--	--	--	--	400	3.9
162.6	--	--	--	--	8	--	--	--	--	--	8	0.1
162.7	8	6	14	--	--	--	--	--	--	--	28	0.3
162.8	223	9	53	21	--	--	10	--	15	--	331	3.2
162.9	1,225	351	155	53	24	--	4	--	1	--	1,813	17.8
163.0	1,633	100	254	213	--	--	13	1	12	--	2,226	21.8
163.1	821	125	155	29	135	--	--	34	7	38	1,344	13.2
163.2	1	--	--	--	7	--	--	--	--	--	8	0.1
163.4	154	152	67	--	--	--	14	--	--	--	387	3.8
163.5	376	120	51	--	--	--	2	--	--	--	549	5.4
163.6	45	--	40	--	--	--	--	--	--	--	85	0.8
163.7	18	22	--	--	--	--	--	--	--	--	40	0.4
163.9	1	--	--	--	--	--	--	--	--	--	1	0.0
Total	5,805	2,687	949	317	198	66	51	44	42	38	10,197	
Percent	56.9	26.4	9.3	3.1	1.9	0.6	0.5	0.4	0.4	0.4		

[1]Observation Time (minutes).

[2]PH=perched hunting, PU=perched unknown, PP=perched preening, PV=perched vocalizing, SH=standing in water, CL=perched close to mate, PK=perched with prey, EC=eating on cliff, SS=Standing on shore, ES=eating on shore.

APPENDIX H: LOWER LAKE MARY BREEDING AREA SUMMARY

Table 26. Observed human activity and bald eagle behavior, Lower Lake Mary BA, Arizona, 2005.

Human Activity	None	Watched	Restless	Flushed	Total	Percent
Fisherman	163	--	--	--	163	47.0
Boats	72	2	--	--	74	21.3
Canoes/Kayaks	55	2	--	2	59	17.0
Float tubes	8	--	--	--	8	2.3
Picnickers	7	--	--	--	7	2.0
Gunshots	4	--	3	--	7	2.0
Sirens	--	3	3	--	6	1.7
Helicopters	--	1	3	2	6	1.7
OHVs	2	2	2	--	6	1.7
Hikers	2	--	--	2	4	1.2
Bicyclists	--	--	--	2	2	0.6
Equestrians	--	--	2	--	2	0.6
Construction	--	--	2	--	2	0.6
Dogs	--	--	1	--	1	0.3
Total	313	10	16	8	347	

Table 27. Observed forage event and success, Lower Lake Mary BA, Arizona, 2005.

Sex	Fish		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	25	23-2	2	1-1	5	5-0	32	29-3
Female	13	13-0	1	1-0	1	1-0	15	15-0
Total	38	36-2	3	2-1	6	6-0	47	44-3

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

Table 28. Observed prey types delivered to the nest, Lower Lake Mary BA, Arizona, 2005.

Sex	Fish	Mammals	Unknown	Total	Percent
Male	24	2	4	30	66.7
Female	13	1	1	15	33.3
Total	37	3	5	45	
Percent	82.2	6.7	11.1		

Table 29. Observed prey items delivered to the nest, Lower Lake Mary BA, Arizona, 2005.

Sex	Fish		Mammals	Total	Percent
	Rainbow Trout	Catfish Species	Ground Squirrel		
Male	23	1	2	26	65.0
Female	12	1	1	14	35.0
Total	35	2	3	40	
Percent	87.5	5.0	7.5		

Table 30. Bald eagle habitat analysis at the Lower Lake Mary BA, Arizona, 2005.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[6]	Land Type[5]
2.0a	CS	Left	Yes	6	RC	CF
2.0b	--	Left	Yes	6	RC	CF
2.1	PS	Left	Partial	6	RC	CF
2.15	PO	Left	Yes	6	RC	CF
2.2a	NE	Left	Partial	6	RC	CF
2.2b	SH	Left	No	6	RC	CF
2.3	SH	Left	No	5	RC	CF
2.4	SH	Left	No	6	RC	CF
4.5	SH	Right	No	5	RC	CF
4.7	SH	Right	No	5	RC	CF

[1]River kilometer (Unpublished data).
[2]CS=closure sign, PS=pine/conifer, 2nd growth/10-20m, PO=pine/conifer, old growth/20-30+m, NE=nest, SH=hard 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.
[5]CF=coniferous forest.

Table 31. Bald eagle habitat use at the Lower Lake Mary BA, Arizona, 2005.									
River km	PW[1,2]	PU	PR	EN	PP	PV	ET	Total	Percent
2.0a	1,283	33	--	--	--	6	--	1,322	8.0
2.0b	379	--	--	--	--	--	--	379	2.3
2.1	601	2	57	--	--	--	--	660	4.0
2.15	206	--	--	--	--	--	--	206	1.3
2.2a	2,755	813	450	390	150	10	--	4,568	27.8
2.2b	606	382	137	--	8	--	--	1,133	6.9
2.3	6,556	--	104	--	105	29	24	6,818	41.4
2.4	908	--	--	--	10	--	--	918	5.6
4.0	86	--	--	--	--	--	--	86	0.5
4.3	20	--	--	--	--	--	--	20	0.1
4.5	348	--	--	--	--	--	--	348	2.1
Total	13,748	1,230	748	390	273	45	24	16,458	
Percent	83.5	7.5	4.5	2.4	1.7	0.3	0.1		

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

APPENDIX I: LUNA BREEDING AREA SUMMARY

Table 32. Observed human activity and bald eagle behavior, Luna BA, Arizona, 2005.

Human Activity	None	Watched	Restless	Flushed	Left Area	Total	Percent
Fishermen	714	27	--	--	--	741	59.1
Boats	188	4	1	--	--	193	15.4
Picnickers	147	7	2	--	--	156	12.5
Hikers	51	1	--	--	--	52	4.2
Float tubes	43	1	--	--	--	44	3.5
Canoes/Kayaks	21	--	1	--	--	22	1.8
Military Jets	1	--	7	3	--	11	0.9
Agency Workers	7	--	2	--	--	9	0.7
Swimmers	6	--	--	--	--	6	0.5
Construction	--	2	2	--	--	4	0.3
Bicyclists	4	--	--	--	--	4	0.3
Helicopters	2	1	--	--	--	3	0.2
Gun Shots	--	--	--	3	--	3	0.2
Dogs	2	--	--	--	--	2	0.2
ATV/Motorcycles	--	--	--	--	2	2	0.2
Photographers	1	--	--	--	--	1	0.1
Total	1,187	43	15	6	2	1,253	

Table 33. Observed forage event and success, Luna BA, Arizona, 2005.

Sex	Birds		Fish		Mammals		Herps		Carrion		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U	E	S-U
Male	55	26-29	17	17-0	4	4-0	1	1-0	13	13-0	90	61-29
Female	36	25-11	4	4-0	3	3-0	--	--	13	13-0	56	45-11
Unknown	3	3-0	--	--	--		--	--	--	--	3	3-0
Total	94	54-40	21	21-0	7	7-0	1	1-0	26	26-0	149	109-40

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

Table 34. Observed prey types delivered to the nest, Luna BA, Arizona, 2005.

Sex	Birds	Fish	Mammals	Carrion	Herps	Unknown	Total	Percent
Male	26	17	4	2	1	11	61	56.0
Female	25	4	3	1	--	12	45	41.3
Unknown	3	--	--	--	--	--	3	2.8
Total	54	21	7	3	1	23	109	
Percent	49.5	19.3	6.4	2.8	0.9	21.1		

Table 35. Observed prey species delivered to the nest, Luna BA, Arizona 2005.

Sex	Birds		Fish		Mammals			Herps	Total	Percent
	AC[1]	WS	RT	CT	GO	GS	RS	GT		
Male	24	2	12	5	4	--	--	1	48	57.8
Female	19	6	1	3	--	2	1	--	32	38.6
Unknown	3	--	--	--	--	--	--	--	3	3.6
Total	46	8	13	8	4	2	1	1	83	
Percent	55.4	9.6	15.7	9.6	4.8	2.4	1.2	1.2		

[1]AC=American coot, WS=waterfowl species, RT=rainbow trout, CT=cutthroat trout, GO=gopher, GS=ground squirrel, RS=rabbit species, GT=garter snake.

Table 36. Bald eagle habitat analysis at the Luna BA, Arizona, 2005.

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	7	CF
2.2	SH	Left	No	7	CF
2.3	PO	Left	Partial	7	CF
2.4	SH	Left	No	7	CF
2.5	PS	Left	No	2	CF
2.6	CS	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,CS=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 37. Bald eagle habitat use at the Luna BA, Arizona, 2005.

Lake km	PW[1,2]	PR	PH	PP	EN	PV	ET	CL	Total	Percent
0.3	28	--	161	--	--	--	--	--	189	0.5
0.7	244	85	100	11	--	--	--	--	440	1.1
0.9	728	--	540	--	--	--	--	--	1,268	3.1
1.1	65	--	--	--	--	--	--	--	65	0.2
1.7	53	--	113	--	--	--	--	--	166	0.4
1.8	185	--	35	--	--	--	--	--	220	0.5
2.0	1,645	181	--	--	--	40	--	--	1,866	4.6
2.1	340	--	--	--	--	--	--	--	340	0.8
2.2	1,161	108	--	--	--	2	--	--	1,271	3.1
2.3	934	907	--	--	461	21	--	--	2,323	5.7
2.4	18,687	2,025	6	458	--	348	57	28	21,609	53.0
2.5	1,537	792	487	25	--	--	--	--	2,841	7.0
2.6	1,103	350	476	46	--	--	--	--	1,975	4.8
2.7	2,354	101	823	--	--	--	--	--	3,278	8.0
2.8	1,291	--	104	--	--	2	--	--	1,397	3.4
3.5	908	70	253	44	--	--	--	--	1,275	3.1
5.1	129	--	110	--	--	--	--	--	239	0.6
Total	31,392	4,619	3,208	584	461	413	57	28	40,762	
Percent	77.0	11.3	7.9	1.4	1.1	1.0	0.1	0.1		

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

APPENDIX J: NEEDLE ROCK BREEDING AREA SUMMARY

Table 38. Observed human activity and bald eagle behavior, Needle Rock BA, Arizona, 2005.

Human Activity	N[1]	W	F	B	Total	Percent
Helicopters	12	--	1	--	13	46.4
Small planes	6	1	--	--	7	25.0
Boaters	3	--	1	--	4	14.3
Motor para-gliders	1	--	1	--	2	7.1
Hikers	--	--	--	2	2	7.1
Total	22	1	3	2	28	

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

Table 39. Observed forage event and success, Needle Rock BA, Arizona, 2005.

Sex	Fish		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	31	13-18	1	1-0	13	11-2	45	25-20
Female	29	12-17	2	2-0	13	10-3	44	24-20
Unknown	2	0-2	--	--	4	4-0	6	4-2
Total	62	25-37	3	3-0	30	25-5	95	53-42

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

Table 40. Observed prey types delivered to the nest, Needle Rock BA, Arizona, 2005.

Sex	Fish	Mammals	Unknown	Total	Percent
Male	4	--	5	9	25.7
Female	5	2	12	19	54.3
Unknown	1	1	5	7	20.0
Total	10	3	22	35	
Percent	28.6	8.6	62.9		

Table 41. Bald eagle habitat analysis at the Needle Rock BA, Arizona, 2005.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
25.2	ST	Left	No	2	RU	UP
25.3	ST	Left	No	2	RU	UP
25.4	CL	Left	Yes	2	RU	CW
25.5	CL	Left	Yes	2	RU	CW
25.6a	SH	Left	No	1	RU	--
25.6b	SH	Left	Partial	4	--	UP
25.7a	SH	Left	No	1	RU	--
25.7b	ID	Island	No	1	RU	--
25.7c	CM	Island	Partial	1	RU	--
25.7d	SO	Right	No	1	RU	--
25.8	ST	Left	No	3	--	UP
25.9a	YL	Left	Partial	3	--	UP
25.9b	NE	Left	Partial	3	--	UP
26.0a	CL	Left	Yes	2	RU	CW
26.0b	CL	Left	Yes	2	RU	CW
26.1	SH	Left	No	1	RU	--
26.2	SH	Left	Partial	1	RU	--
26.3	ST	Left	No	3	--	CW, UP
26.4	ST	Left	No	3	--	UP
26.5	ST	Left	No	3	--	CW, UP
27.1	DL	Right	Partial	1	RB	--
27.2	CM	Left	Partial	1	PO	--
27.3a	CM	Left	Partial	1	PO	--
27.3b	SO	Right	No	1	PO	--
27.3c	SH	Left	No	1	PO	--
27.4	CM	Left	Partial	1	PO	--
27.5	SH	Left	No	1	PO	--
27.7	ST	Left	No	1	PO	--
28.5	CL	Right	Partial	2	RU	--
28.9	SH	Left	No	2	RU	UP
29.5a	PT	Right	No	1	RU	--
29.5b	PT	Island	No	1	RU	--
29.5c	PT	Island	No	1	RU	--
30.9	BO	Right	No	1	RU	--

[1]River kilometer (Hunt et. al. 1992).
[2]ST=snag top, CL=cottonwood large/20-30+m, SH=hard snag, ID=island, CM=cottonwood medium/10-20m, SO=shore, YL=sycamore large/10-20+m, NE=nest, DL=deciduous large/10-20+m, PT=pinnacle 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]RU=run, RB=river bend, PO=pool.
[5]UP=desert upland, CW=cottonwood grove.

Table 42. Bald eagle habitat use at the Needle Rock BA, Arizona, 2005.

River km	PW[1,2]	PP	ES	ET	SS	PK	Total	Percent
25.2	1,118	81	--	--	--	--	1,199	5.1
25.3	325	10	--	--	--	7	342	1.5
25.4	542	--	--	--	--	--	542	2.3
25.5	--	1,307	--	--	--	--	1,307	5.6
25.6	728	13	--	--	--	--	741	3.2
25.7	201	--	2	--	--	--	203	0.9
25.8	1,264	66	--	--	--	--	1,330	5.7
26.0	4,176	28	--	--	--	--	4,204	18.0
26.1	11	--	--	--	--	--	11	0.0
26.2	45	--	--	--	--	--	45	0.2
26.3	45	--	--	--	--	--	45	0.2
26.4	1,182	--	--	--	--	--	1,182	5.1
26.5	1,880	--	--	--	--	--	1,880	8.1
27.0	73	--	--	--	--	--	73	0.3
27.1	577	--	--	19	--	--	596	2.6
27.2	165	--	--	--	--	--	165	0.7
27.3	1,625	50	25	--	18	2	1,720	7.4
27.4	915	--	45	--	4	--	964	4.1
27.5	620	--	--	--	--	--	620	2.7
27.6	23	--	--	--	--	--	23	0.1
27.7	103	--	--	--	--	--	103	0.4
28.9	699	--	--	27	--	6	732	3.1
29.4	46	--	--	--	--	--	46	0.2
29.5	1,859	--	--	--	--	--	1,859	8.0
30.9	3,395	--	--	--	--	--	3,395	14.6
Total	21,617	1,555	72	46	22	15	23,327	
Percent	92.7	6.7	0.3	0.2	0.1	0.1		

[1]Observation Time (minutes).
[2]PW=perched watching, PP=perched preening, ES=eating on shore, ET=eating in tree, SS=standing on shore, PK=perched with prey.

APPENDIX K: ORME BREEDING AREA SUMMARY

Table 43. Observed human activity and bald eagle behavior, Orme BA, Arizona 2005.

Human Activity	N[1]	W	R	F	L	X	B	U	Total	Percent
Helicopters	54	58	1	1	1	1	1	19	136	23.7
Small Planes	75	20	--	--	--	1	--	5	101	17.6
Apache helicopters	36	47	4	1	--	4	--	5	97	16.9
Drivers	58	15	--	--	--	--	5	5	83	14.4
Rafters	41	2	--	--	--	--	--	1	44	7.7
Hikers	12	12	1	4	1	--	--	--	30	5.2
Canoes/Kayaks	11	4	2	2	--	--	--	3	22	3.8
Agency workers	2	7	1	2	2	--	--	2	16	2.8
Picnickers	6	2	--	--	--	--	--	--	8	1.4
Birders	2	2	--	2	1	--	--	--	7	1.2
Boaters	2	--	--	--	--	--	3	--	5	0.9
Ranchers	2	2	--	--	--	--	--	--	4	0.7
Bikers	2	1	--	--	--	--	1	--	4	0.7
Photographers	1	--	--	1	--	1	--	--	3	0.5
Fishermen	2	1	--	--	--	--	--	--	3	0.5
Swimmers	2	--	--	--	--	--	--	--	2	0.3
Tubers	1	1	--	--	--	--	--	--	2	0.3
Gunshots	2	--	--	--	--	--	--	--	2	0.3
Campers	1	--	--	--	--	--	--	--	1	0.2
Water Plant alarm	1	--	--	--	--	--	--	--	1	0.2
Construction	--	--	--	--	1	--	--	--	1	0.2
Truck horns	--	--	--	--	--	1	--	--	1	0.2
Hunters	--	--	--	1	--	--	--	--	1	0.2
Woodcutters	--	--	--	--	--	--	--	--	1	0.2
Total	313	175	9	14	6	8	10	40	575	

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

Table 44. Observed forage event and success, Orme BA, Arizona, 2005.

Sex	Fish		Birds		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	18	8-10	--	--	4	2-2	22	10-12
Female	13	6-7	8	0-8	5	2-3	26	8-18
Unknown	4	4-0	--	--	4	2-2	8	6-2
Total	35	18-17	8	0-8	13	6-7	56	24-32

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

Table 45. Observed prey types delivered to the nest, Orme BA, Arizona, 2005.

Sex	Fish	Mammals	Birds	Unknown	Total	Percent
Male	8	--	1	4	13	39.4
Female	8	--	--	6	14	42.4
Unknown	4	2	--	--	6	18.2
Total	20	2	1	10	33	
Percent	60.6	6.1	3.0	30.3		

Table 46. Bald eagle habitat analysis at the Orme BA, Arizona, 2005.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
0.2v[6]	SH	Right	No	5	RU	CW
0.3v	SH	Right	No	5	RU	CW
0.4a,v	SH	Right	No	5	RU	CW
0.4b,v	CL	Right	No	5	RU	CW
0.4c,v	SB	Island	No	1	BW	CW
0.5v	MS	Left	No	1	RU	MB
0.6v	CM	Right	No	1	RU	CW
0.9V	MS	Left	No	1	RU	MB
1.0a,v	WO	Left	Yes	1	RU	MB
1.0b,v	SB	Island	No	1	RU	MB
1.1a,v	WO	Left	No	1	RU	WT
1.1b,v	SB	Island	No	1	RU	WT
1.2v	SH	Left	No	1	RU	MB
2.0v	MS	Left	No	1	PO	MB
4.6s	SH	Left	No	2	RU	CW
4.7s	SH	Right	No	4	RI	CW
4.8s	SH	Left	No	3	RU	CW
4.9a,s	CM	Right	Yes	5	RU	CW
4.9b,s	SH	Left	No	1	RU	CW
5.0s	CL	Left	No	1	RU	CW
5.1s	CL	Right	No	1	RU	CW
5.2a,s	CL	Right	No	1	BW	CW
5.2b,s	CM	Left	No	1	RU	CW
6.2c,s	CF	Left	No	2	PO	CL
6.5a,s	CL	Right	Yes	2	BW	CW
6.5b,s	PT	Left	No	5	RU	CW
7.0s	SH	--	No	--	--	CW

[1]River kilometer (Hunt et. al. 1992).
[2]SH=hard snag, CL=cottonwood large/20-30+m, SB=sand bar, MS=mesquite, CM=cottonwood medium/10-20m, WO=willow, PT=pinnacle 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]RU=run, BW=backwater, PO=pool.
[5]CW=cottonwood grove, MB=mesquite bosque, WT=willow thicket, CL=cliffs.
[6]v=Verde River, s=Salt River.

Table 47. Bald eagle habitat use at the Orme BA, Arizona, 2005.

River km	PH[1,2]	PP	ES	SH	SS	PK	PV	ET	Total	Percent
0.2v[3]	75	--	--	--	--	--	--	--	75	0.3
0.3v	110	2	--	4	--	--	--	--	116	0.4
0.4v	18,512	1,413	35	96	41	73	72	41	20,283	72.9
0.5v	1,276	18	40	11	7	6	--	--	1,358	4.9
0.6v	161	--	56	36	10	11	--	--	274	1.0
0.9v	237	--	35	9	19	3	--	--	303	1.1
1.0v	2,690	7	19	9	--	3	--	--	2728	9.8
1.1v	949	10	173	4	29	--	--	--	1,165	4.2
1.2v	137	--	--	--	--	--	--	--	137	0.5
2.0v	15	--	--	--	--	--	1	--	16	0.1
4.6s	104	--	--	--	--	--	--	--	104	0.4
4.7s	40	--	--	--	--	--	--	--	40	0.1
4.8s	83	--	--	--	--	--	--	--	83	0.3
4.9s	236	--	--	--	--	--	--	--	236	0.8
5.0s	356	--	--	--	--	--	--	--	356	1.3
5.1s	48	--	21	--	1	--	--	--	70	0.3
5.2s	177	34	--	--	--	--	--	--	211	0.8
6.2s	112	--	--	--	--	--	--	--	112	0.4
6.5s	94	--	--	--	--	--	--	19	113	0.4
7.0s	13	18	--	--	--	--	--	--	31	0.1
Total	25,425	1,502	379	169	107	96	73	60	27,811	
Percent	91.4	5.4	1.4	0.6	0.4	0.3	0.3	0.2		

[1]Observation Time (minutes).
[2]PH=perched hunting, PP=perched preening, ES=eating on shore, SH=standing in water, SS=standing on shore, PK=perched with prey, PV=perched vocalizing, ET=eating in tree.
[3]v=Verde River, s=Salt River.

APPENDIX L: PINTO BREEDING AREA SUMMARY

Table 48. Observed human activity and bald eagle behavior, Pinto BA, Arizona, 2005.

Human Activity	N[1]	W	F	L	B	U	Total	Percent
Boaters/Jet Skis	221	46	1	5	56	--	329	87.7
Small Planes	7	3	--	--	3	1	14	3.7
Agency Workers	9	2	--	--	--	--	11	2.9
Helicopters	4	2	--	--	1	--	7	1.9
Kayakers/Rafters	3	1	--	--	3	--	7	1.9
Gunshots	2	--	--	1	1	--	4	1.1
Drivers	1	--	--	--	--	--	1	0.3
Hikers	--	--	--	--	--	1	1	0.3
Researchers	1	--	--	--	--	--	1	0.3
Total	248	54	1	6	64	2	375	

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

Table 49. Observed forage event and success, Pinto BA, Arizona, 2005.

Sex	Fish		Birds		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	11	7-4	8	1-7	19	8-11
Female	19	10-9	3	0-3	22	10-12
Total	30	17-13	11	1-10	41	18-23

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

Table 50. Observed prey types delivered to the nest, Pinto BA, Arizona, 2005.

Sex	Fish	Birds	Unknown	Total	Percent
Male	30	1	16	37	64.4
Female	21	--	4	25	34.2
Unknown	--	--	1	1	1.4
Total	51	1	21	73	
Percent	69.9	1.4	28.8		

Table 51. Bald eagle habitat analysis at the Pinto BA, Arizona, 2005.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
101.0	DW	Left	No	1	RC	TX
101.6	CT	Right	No	1	RC	UP
101.8	CT	Right	No	1	RC	UP
101.9	CT	Right	No	1	RC	UP
102.0	SH	Left	No	1	RC	TX
102.2	CT	Right	No	1	RC	UP
102.3a	CT	Right	No	1	RC	UP
102.3b	SH	Left	No	1	RC	TX
102.4a	CT	Right	No	1	RC	UP
102.4b	CL	Right	No	1	RC	CL
102.5a	CL	Right	No	1	RC	CL
102.5b	CT	Right	No	1	RC	UP
102.5d	SH	Left	No	1	RC	TX
102.6a	CT	Right	No	1	RC	UP
102.6b	CL	Right	No	1	RC	CL
102.7	CT	Right	No	1	RC	UP
102.8a	CL	Right	Partial	2	RC	CL
102.8b	CT	Right	No	1	RC	UP
102.8c	SH	Left	No	2	RC	TX
102.9	CT	Right	No	1	RC	UP
103.0a	CT	Right	No	1	RC	CL
103.0b	SH	Left	No	2	RC	TX
103.0c	SH	Left	No	1	RC	TX
103.2	CL	Right	Yes	1	RC	CL
103.3a	RI	Right	No	1	RC	UP
103.3b	CT	Right	No	1	RC	UP
103.4	SH	Left	No	2	RC	TX
103.5	SH	Left	No	5	RC	TX
103.7	DW	Left	No	1	RC	TX
104.1a	CM	Right	Yes	1	RC	TX
104.1b	SH	Right	No	1	RC	TX
104.2a	SH	Right	No	1	RC	TX
104.2b	CL	Right	Partial	1	RC	TX
104.3a	CM	Right	No	1	RC	TX
104.3b	SH	Right	No	1	RC	TX
104.4a	SH	Right	No	1	RC	TX
104.4b	SH	Right	No	1	RC	TX
104.4c	CM	Right	No	1	RC	TX
104.4d	CM	Right	Yes	1	RC	TX
104.4e	CM	Right	No	1	RC	TX
104.4f	NE	Right	No	1	RC	TX
104.5a	DW	Right	No	1	RC	TX
104.5b	CM	Right	No	1	RC	TX
104.5c	SH	Right	No	1	RC	TX

[1]River kilometer (Hunt et. al. 1992).
[2]DW=driftwood, CT=cliff top, SH=snag, CL=cliff ledge, RI=ridge, CM=cottonwood medium/10-20m, CL=cottonwood large/20-30+m, 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]RC=reservoir cove, PO=pool.
[5]TX=tamarisk thicket, UP=desert upland, CL=cliffs.

Table 51. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
104.6	DW	Right	No	1	RC	TX
104.8	SH	Right	No	1	RC	TX
105.4	SH	Right	No	1	RC	TX
105.5a	SH	Right	No	1	RC	TX
105.5b	SH	Left	No	1	RC	TX
105.8	CT	Left	No	3	RC	UP
106.0	CM	Right	Yes	2	RC	TX
106.2	SH	Right	No	2	RC	TX
106.5a	SH	Right	No	2	RC	TX
106.5b	SH	Left	No	1	RC	TX
106.6	SH	Right	No	2	RC	TX
107.2	SH	Right	No	1	RC	TX
107.5	SH	Right	No	2	RC	TX
108.0a	SH	Right	No	3	PO	TX
108.0b	SH	Right	No	2	PO	TX

[1]River kilometer (Hunt et. al. 1992).
[2]DW=driftwood, CT=cliff top, SH=snag, CL=cliff ledge, RI=ridge, CM=cottonwood medium/10-20m, CL=cottonwood large/20-30+m, 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]RC=reservoir cove, PO=pool.
[5]TX=tamarisk thicket, UP=desert upland, CL=cliffs.

Table 52. Bald eagle habitat use at the Pinto BA, Arizona, 2005.

River km	PW[1,2]	CL	PP	ET	GN	Total	Percent
101.0	40	--	--	8	--	48	1.5
101.6	8	--	--	--	--	8	0.3
101.9	36	--	--	--	--	36	1.2
102.0	108	--	--	--	--	108	3.5
102.2	13	--	--	--	--	13	0.4
102.3	207	--	8	--	--	215	6.9
102.4	12	--	--	--	--	12	0.4
102.5	452	--	12	--	--	464	14.8
102.6	210	--	--	--	--	210	6.7
102.7	10	--	--	--	--	10	0.3
102.8	194	--	--	10	--	204	6.5
102.9	9	--	--	--	--	9	0.3
103.0	120	--	--	--	1	121	3.9
103.2	44	--	--	--	--	44	1.4
103.3	179	--	5	--	--	184	5.9
103.4	11	--	--	--	2	13	0.4
103.5	29	--	--	--	--	29	0.9
103.7	1	--	--	2	--	3	0.1
104.2	182	--	2	2	1	187	6.0
104.6	5	--	4	--	--	9	0.3
104.8	--	--	--	--	1	1	0.0
105.4	2	--	--	--	--	2	0.1
105.5	20	--	5	--	--	25	0.8
105.8	79	--	--	--	--	79	2.5
106.0	243	--	--	--	--	243	7.8
106.2	90	88	18	--	--	196	6.3
106.5	59	--	--	--	--	59	1.9
106.6	1	--	1	--	--	2	0.1
107.2	353	--	1	--	--	354	11.3
107.5	91	--	--	--	--	91	2.9
108.0	131	--	--	--	--	131	4.2
109.9	18	--	--	--	--	18	0.6
Total	2,57	88	56	22	5	3,128	
Percent	94.5	2.8	1.8	0.7	0.2		

[1]Observation Time (minutes).
[2]PW=perched watching, CL=perched close to mate, PP=perched preening, ET=eating in tree, GN=gathering nest material.

APPENDIX M: PLEASANT BREEDING AREA SUMMARY

Table 53. Observed human activity and bald eagle behavior, Pleasant BA, Arizona, 2005.

Human Activity	N[1]	W	R	B	U	Total	Percent
Small Planes	11	10	2	9	2	34	30.1
Boats	13	--	--	9	3	25	22.1
Helicopters	6	5	--	7	--	18	15.9
Fishermen	6	1	--	5	4	16	14.2
Agency Boat	6	1	--	6	1	14	12.4
Military Jets	3	2	--	--	--	5	4.4
Jet Skis	1	--	--	--	--	1	0.9
Total	46	19	2	36	10	113	

[1]Bald eagle behavior, N=none, W=watched, R=restless, B=birds not in area, U=unknown.

Table 54. Watercraft compliance at the southern closure boundary, Pleasant BA, Arizona, 2005.

Date	Boats at Closure	Boats in Closure	Jet Skis at Closure	Jet Skis in Closure	Total
2/5-2/13	67	10	5	--	82
2/18-2/27	49	2	1	--	52
3/4-3/13	257	15	10	1	283
3/19-3/27	260	3	16	--	279
Total	633	30	32	1	696
Percent	90.9	4.3	4.6	0.1	

Table 55. Watercraft compliance: weekend vs. weekday, Pleasant BA, Arizona, 2005.

Date	Boats at Closure	Boats in Closure	Jet Skis at Closure	Jet Skis in Closure	Total	Percent
Weekend	464	23	20	1	508	73.0
Weekday	169	7	12	--	188	27.0
Total	632	30	32	1	696	

Table 56. Bald eagle habitat analysis at the Pleasant BA, Arizona, 2005.

Perch Location[1]	Perch Type[2]	Side	Distance to H_2O[3]	H_2O Type[4]
67.4	CT	Left	2	RC
68.6a	SO	Left	1	RC
68.6b	BO	Left	1	RC
68.7a	BO	Left	1	RC
68.7b	RI	Left	1	RC
68.7c	BO	Left	1	RC
68.8a	CT	Left	1	RC
68.8b	BO	Left	1	RC
68.8c	CF	Left	1	RC
68.9a	CF	Left	1	RC
68.9b	BO	Left	1	RC
68.9c	CT	Left	1	RC
68.9d	RI	Right	5	RC
69.0a	CF	Left	1	RC
69.0b	CT	Left	1	RC
69.1a	CT	Left	1	RC
69.1b	CF	Left	1	RC
69.2a	CF	Left	1	RC
69.2b	CT	Left	1	RC
69.2c	BO	Left	1	RC
69.3a	SO	Left	1	RC
69.3b	CT	Left	1	RC
69.3c	CF	Left	1	RC
69.4a	SO	Left	1	RC
69.4b	BO	Left	1	RC
69.4c	SP	Left	1	RC
69.5a	SO	Left	1	RC
69.5b	DW	Center	1	RC
69.5c	ID	Left	1	RC
73.3a	NE	Left	1	PO
73.3b	CT	Left	2	PO
73.6	CT	Right	2	RB

[1]River kilometer (Hunt et. al. 1992).
[2]CT=cliff top, SO=shore, BO=boulder, RI=ridge, CF=cliff face, CT=cliff top, SP=stump or fallen tree, DW=driftwood, ID=island, 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]RC=reservoir cove, PO=pool, RB=river bend.

Table 57. Bald eagle habitat use at the Pleasant BA, Arizona, 2005.

River km	PH[1,2]	PP	CL	PU	PV	EC	DW	Total	Percent
68.6	12	--	3	42	--	--	9	66	0.9
68.7	72	18	2	--	10	--	9	111	1.5
68.8	2,178	1,457	404	105	155	29	--	4,328	59.1
68.9	808	799	30	50	16	12	--	1,715	23.4
69.0	10	21	--	117	--	54	--	202	2.8
69.1	299	78	3	--	--	18	--	398	5.4
69.2	149	38	33	2	7	--	--	229	3.1
69.3	38	66	--	--	--	--	8	112	1.5
69.4	44	64	--	--	--	--	27	135	1.8
69.5	14	--	--	--	--	--	11	25	0.3
Total	3,624	2,541	475	316	188	113	64	7,321	
Percent	49.5	34.7	6.5	4.3	2.6	1.5	0.9		

[1]Observation Time (minutes).

[2]PH=perched hunting, PP=perched preening, CL=perched close to mate, PU=perched unknown, PV=perched vocalizing, EC=eating on cliff, DW=drinking water.

APPENDIX N: SAN CARLOS BREEDING AREA SUMMARY

Table 58. Observed human activity and bald eagle behavior, San Carlos BA, Arizona, 2005.

Human Activity	N[1]	W	R	F	L	B	Total	Percent
Hikers	22	--	--	1	1	4	28	28.9
Drivers	21	--	--	--	--	3	24	24.7
Track Maintenance	14	1	--	--	--	1	16	16.5
Horseback Riders	5	1	--	--	--	1	7	7.2
Construction	3	1	--	--	--	--	4	4.1
Gunshots	2	1	--	--	--	--	3	3.1
OHVs	3	--	--	--	--	--	3	3.1
Researchers	--	--	--	--	2	--	2	2.1
Small Planes	1	1	--	--	--	--	2	2.1
Sonic Booms	2	--	--	--	--	--	2	2.1
Woodcutters	2	--	--	--	--	--	2	2.1
Jets	--	--	1	--	--	--	1	1.0
Helicopters	--	1	--	--	--	--	1	1.0
Car Noise	--	1	--	--	--	--	1	1.0
Bicyclers	1	--	--	--	--	--	1	1.0
Total	76	7	1	1	3	9	97	

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

Table 59. Observed forage event and success, San Carlos BA, Arizona, 2005.

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

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

Table 60. Observed prey types delivered to the nest, San Carlos BA, Arizona, 2005.

Sex	Fish	Birds	Mammals	Reptiles	Unknown	Total	Percent
Male	24	2	--	--	16	42	59.2
Female	17	--	1	1	10	29	40.8
Total	41	2	1	1	26	71	
Percent	57.7	2.8	1.4	1.4	36.6		

Table 61. Observed prey items delivered to the nest, San Carlos BA, Arizona, 2005.

Sex	Fish			Total	Percent
	LB[1]	BC	GF		
Male	2	1	1	4	57.1
Female	1	1	1	3	42.9
Total	3	2	2	7	
Percent	42.9	28.6	28.6		

[1]LB=largemouth bass, BC=black crappie, GF=goldfish.

Table 62. Bald eagle habitat analysis at the San Carlos BA, Arizona, 2005.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
5.8	CT	Right	No	1	RU	CL
10.7	SG	Right	No	4	RU	CW
10.8a	SG	Right	No	2	RU	CW
10.8b	CL	Left	--	4	RU	CW
10.8c	CX	Left	Partial	4	RU	CW
10.9	CL	Right	Yes	1	RU	CW
11.0a	CL	Right	Yes	1	RU	CW
11.0b	CX	Right	No	3	RU	CW
11.0c	CL	Right	Partial	1	RU	CW
11.1a	CN	Right	--	--	RU	CW
11.1b	SG	Right	No	3	RU	CW
11.1c	CX	Right	No	2	RU	CW
11.1d	CL	Right	No	1	RU	CW
11.1e	CM	Right	Partial	1	RU	CW
11.2	SG	Right	No	3	RU	CW
11.4	SG	Right	No	4	RU	CW

[1]River kilometer (Hunt et. al. 1992).
[2]CT=cliff top, SG=snag, CL=cottonwood large/20-30+m, CX=cottonwood unspecified, CN=close to nest, CM=cottonwood medium/10-20m.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run
[5]CL=cliff, CW=cottonwood grove.

Table 63. Bald eagle habitat use at the San Carlos BA, Arizona, 2005.

River km	PH[1,2]	PP	CL	PV	PU	PK	PX	Total	Percent
5.8	7	--	--	1	--	--	--	8	0.1
10.7	10	--	--	1	--	--	--	11	0.1
10.8a	19	--	--	--	--	--	1	20	0.2
10.8b	--	--	--	--	1	--	--	1	0.0
10.8c	--	--	--	--	2	--	--	2	0.0
10.9	116	14	--	--	--	--	--	130	1.5
11.0a	--	10	--	--	--	--	--	10	0.1
11.0c	3,383	558	60	7	2	--	--	4,010	47.2
11.1a	173	42	20	2	5	--	--	242	2.9
11.1d	105	9	3	4	5	--	--	126	1.5
11.1e	2,061	714	151	8	4	5	--	2,943	34.7
11.2	63	2	--	1	--	--	2	68	0.8
11.4	591	271	53	2	2	--	--	919	10.8
Total	6,528	1,620	287	26	21	5	3	8,490	
Percent	76.9	19.1	3.4	0.3	0.2	0.1	0.0		

[1]Observation Time (minutes).
[2]PH=perched hunting, PP=perched preening, CL=perched close to mate, PV=perched vocalizing, PU=perched unknown, PK=perched with prey, PX=perched interaction.

APPENDIX O: TONTO BREEDING AREA SUMMARY

Table 64. Observed human activity and bald eagle behavior, Tonto BA, Arizona, 2005.

Human Activity	N[1]	W	F	X	U	Total	Percent
Boats	583	8	1	--	--	592	90.2
Canoes/Kayaks	21	--	--	--	--	21	3.2
Helicopters	11	6	--	--	1	18	2.7
Jet skis	6	4	--	--	--	10	1.5
Small planes	4	2	--	--	1	7	1.1
Motor-parachutes	--	--	--	2	--	2	0.3
Hikers	2	--	--	--	--	2	0.3
ATVs	1	--	--	--	--	1	0.2
Dogs	1	--	--	--	--	1	0.2
Water skiers	1	--	--	--	--	1	0.2
Agency workers	--	1	--	--	--	1	0.2
Total	630	21	1	2	2	656	

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

Table 65. Watercraft compliance at the southern closure boundary, Tonto BA, Arizona, 2005.

Date	Boats at Closure	Boats in Closure	Canoes and Kayaks at Closure	Canoes and Kayaks in Closure	Jet Skis at Closure	Jet Skis in Closure	Total
2/18-2/27	5	--	1	--	--	--	6
3/4-3/13	31	1	1	--	--	--	33
3/19-3/17	107	6	1	1	1	--	116
4/1-4/10	122	8	5	1	--	2	138
4/15-4/24	107	14	3	--	2	--	126
4/29-5/8	95	8	3	3	--	--	109
5/13-5/22	81	7	1	1	3	2	95
Total	548	44	15	6	6	4	623
Percent	88.0	7.1	2.4	1.0	1.0	0.6	

Table 66. Observed forage event and success, Tonto BA, Arizona, 2005.

Sex	Fish		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	10	6-4	1	1-0	11	7-4
Female	7	5-2	2	2-0	9	7-2
Both	1	1-0	1	1-0	2	2-0
Total	18	12-6	4	4-0	22	16-6

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

Table 67. Observed prey typed delivered to the nest, Tonto BA, Arizona, 2005.

Sex	Fish	Birds	Mammals	Herps	Carrion	Unknown	Total	Percent
Male	16	2	1	--	5	8	32	55.2
Female	13	2	2	1	5	3	26	44.8
Total	29	4	3	1	10	11	58	
Percent	50.0	6.9	5.2	1.7	17.2	19.0		

Table 68. Observed prey items delivered to the nest, Tonto BA, Arizona, 2005.						
Sex	Fish				Total	Percent
	BC[1]	RT	CP	SB		
Male	2	1	1	1	5	83.3
Female	1	--	--	--	1	16.7
Total	3	1	1	1	6	
Percent	50.0	16.7	16.7	16.7		

[1]BC=black crappie, RT=rainbow trout, CP=carp, SB=smallmouth bass.

Table 69. Bald eagle habitat analysis at the Tonto BA, Arizona, 2005.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
16.0	CS	Right	No	3	RB	IF
16.1	CS	Right	No	2	RB	IF
16.2	CM	Right	No	1	RU	IF
16.4	BA	Left	No	2	RB	IF
16.5	SM	Right	No	1	RU	IF
16.5	CM	Right	Partial	3	RU	IF
16.5	CM	Right	No	2	RU	IF
16.6	SP	Right	No	1	RU	IF
16.6	CS	Right	Partial	2	RU	CW
16.7	TX	Center	No	1	RU	IF
16.7	SB	Left	Yes	1	RU	IF
16.7	ID	Center	No	1	RU	IF
16.8	SB	Left	Partial	1	RU	IF
16.8	CM	Left	Partial	3	RU	IF
16.9	SM	Left	No	1	RU	MB
16.9	CM	Left	Partial	1	RU	IF
16.9	SO	Right	Partial	1	RU	IF
17.0	CS	Center	No	1	RU	IF
17.0	SH	Right	No	1	RU	IF
17.0	CM	Left	Yes	4	RU	IF
17.3	CM	Center	No	1	RU	IF
17.6	CM	Left	No	3	RU	IF
17.5	SH	Right	No	1	RU	IF
17.5	YL	Right	No	1	RU	IF
18.5	CM	Right	No	3	BW	CW
18.6	CL	Left	No	4	RU	CW

[1]River kilometer (Hunt et. al. 1992).
[2]CS=cottonwood small/0-10m, CM=cottonwood medium/10-20m, BA=cut bank, SM=snag mesquite, SP=stump or fallen tree, TX=tamarix, SB=sand bar, ID=island, SO=shore, SH=hard snag, YL=sycamore large/20-30+m, CL=cottonwood large/20-30+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.
[4]RB=river bend, RU=run.
[5]IF=inflow to reservoir, CW=cottonwood grove, MB=mesquite bosque.

Table 70. Bald eagle habitat use at the Tonto BA, Arizona, 2005.

River km	PW[1,2]	PP	PH	PU	GN	SS	PV	Total	Percent
16.0	3	--	--	--	--	--	--	3	0.1
16.1	10	--	--	--	--	--	--	10	0.2
16.2	24	--	--	--	--	--	--	24	0.5
16.3	56	--	--	--	--	--	--	56	1.1
16.4	85	--	--	--	1	--	1	87	1.7
16.5	396	35	--	--	1	1	2	435	8.4
16.6	79	--	2	--	7	--	--	88	1.7
16.7	--	--	3	1	--	9	--	13	0.3
16.8	3,800	33	--	27	8	8	5	3,881	75.2
16.9	1	--	--	--	2	1	--	4	0.1
17.0	85	6	--	1	5	--	--	97	1.9
17.3	--	--	18	--	--	--	--	18	0.3
17.4	75	--	--	--	--	--	--	75	1.5
17.5	154	--	12	1	--	--	--	167	3.2
18.5	9	--	--	--	--	--	--	9	0.2
18.6	195	--	--	--	--	--	--	195	3.8
Total	4,972	74	35	30	24	19	8	5,162	
Percent	96.3	1.4	0.7	0.6	0.5	0.4	0.2		

[1]Observation Time (minutes).
[2]PW=perched watching, PP=perched preening, PH=perched hunting, PU=perched unknown, GN=gathering nest material, SS=standing on shore, PV=perched vocalizing.

APPENDIX P: TOWER BREEDING AREA SUMMARY

Table 71. Observed human activity and bald eagle behavior, Tower BA, Arizona, 2005.

Human Activity	N[1]	W	F	B	U	Total	Percent
Trains	31	68	17	48	16	180	84.5
Small Planes	15	3	--	3	3	24	11.3
Helicopters	2	3	--	--	--	5	2.3
Hikers	1	--	--	--	1	2	0.9
Campers	1	--	--	--	--	1	0.5
Canoes/Kayaks	--	--	--	--	1	1	0.5
Total	50	74	17	51	21	213	

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

Table 72. Observed prey types delivered to nest, Tower BA, Arizona, 2005.

Sex	Fish	Unknown	Total	Percent
Male	5	3	8	34.8
Female	13	2	15	65.2
Total	18	5	23	
Percent	78.3	21.7		

Table 73. Bald eagle habitat analysis at the Tower BA, Arizona, 2005.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
247.0	SJ	Right	Partial	2	RU	UP
247.1a	PP	Left	No	5	RU	UP
247.1b	CF/CT/SJ	Right	Partial	--	RU	UP
247.2a	CF/CT/WO	Left	Partial	--	RU/PO	UP
247.2b	CF/CT/SJ	Right	Partial	--	RU/PO	UP
247.3a	CT	Left	Partial	5	RU	UP
247.3b	CG/CT/SJ	Right	Partial	--	RU/PO	UP
247.4	SJ	Right	Partial	2	RU	UP
247.5	CT/SJ	Right	Partial	2	RU	UP
247.6a	CF	Left	No	2	RU/PO	UP
247.6b	CT	Right	No	2	RU/PO	UP
247.7a	CT	Left	No	2	RU/PO	UP
247.7b	CF/CT/JN	Right	No	--	RU/PO	UP
247.8	--	Right	Partial	--	RU/PO	UP
247.9a	--	Right	Partial	--	RU/PO	UP
247.9b	CT	Left	No	--	RU	UP
248.0a	--	Right	Partial	--	RU/PO	UP
248.0b	CF/CT	Left	Partial	2	RU	UP
248.1a	--	Right	Partial	--	RU/PO	UP
248.1b	--	Left	Partial	--	RU/PO	UP
248.2a	--	Right	Partial	--	RU/PO	UP
248.2b	CF/CT/SJ	Left	Partial	--	RU/PO	UP

[1]River kilometer (Hunt et. al. 1992).
[2]SJ=juniper snag, PP=power pole, CF=cliff face, CT=cliff top, WO=willow, CG=soft snag, JN=juniper, BO=boulder, SH=hard 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]RU=run, PO=pool.
[5]UP=desert upland.

Table 73. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
248.3a	CF/CT/JN	Right	Partial	2	RU/PO	UP
248.3b	CF/CT	Left	Partial	2	RU/PO	UP
248.4	CF/CT	Right	Partial	2	RU/PO	UP
248.5	BO/JN	Right	Partial	2	RU	UP
248.6	PP	Right	Partial	4	RU	UP
248.7	JN	Left	Partial	8	RU	UP
248.9	JN	Right	No	2	RU	UP
250.3	CF	Left	Partial	3	RU	UP
250.5	CT	Left	No	3	RU	UP
251.0	SH	Right	No	1	RU	UP

[1]River kilometer (Hunt et. al. 1992).
[2]SJ=juniper snag, PP=power pole, CF=cliff face, CT=cliff top, WO=willow, CG=soft snag, JN=juniper, BO=boulder, SH=hard 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]RU=run, PO=pool.
[5]UP=desert upland.

Table 74. Bald eagle habitat use at the Tower BA, Arizona, 2005.

River km	PW[1,2]	PD	PP	PR	CL	PV	Total	Percent
247.0	7	--	--	--	--	--	7	0.1
247.1	81	--	2	--	--	--	83	1.3
247.2	519	--	--	--	--	--	519	8.2
247.3	161	--	2	--	--	--	163	2.6
247.4	1	--	--	--	--	--	1	0.0
247.5	46	--	--	--	--	--	46	0.7
247.6	90	52	2	--	--	--	144	2.3
247.7	558	--	--	--	--	--	558	8.9
247.8	196	--	--	--	--	--	196	3.1
247.9	445	19	11	--	--	2	477	7.6
248.0	1,258	35	39	--	--	2	1,334	21.2
248.1	1,225	64	21	75	--	1	1,386	22.0
248.2	920	--	9	--	--	--	929	14.7
248.3	266	--	--	--	--	--	266	4.2
248.4	24	--	--	--	24	--	48	0.8
248.5	12	--	--	--	--	--	12	0.2
248.6	7	--	--	--	--	--	7	0.1
248.7	51	--	--	--	--	--	51	0.8
248.9	5	--	--	--	--	--	5	0.1
250.3	26	--	--	--	--	--	26	0.4
250.5	29	--	--	--	--	--	29	0.5
251.0	13	--	--	--	--	--	13	0.2
Total	5,940	170	86	75	24	5	6,300	
Percent	94.3	2.7	1.4	1.2	0.4	0.1		

[1]Observation Time (minutes).
[2]PW=perched watching, PD=perched drying, PP=perched preening, PR=perched roosting, CL=perched close to mate, PV=perched vocalizing.