ARIZONA BALD EAGLE MANAGEMENT PROGRAM
2006 SUMMARY REPORT

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Technical Report 239
Nongame and Endangered Wildlife Program
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November 2006

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Jacobson, K.V., K.M. McCarty, and J.T. Driscoll. 2006. Arizona bald eagle management program 2006 summary report. Nongame and Endangered Wildlife Program Technical Report 239. Arizona Game and Fish Department, Phoenix, Arizona.

ACKNOWLEDGMENTS

The authors acknowledge and appreciate the assistance of the following people: Nick Fiscina, Arizona Public Service; Dana Banwart, GeoMarine Inc. (U.S. Air Combat Command); Terry Gerber and Darcy Kinsman, Maricopa County Parks and Recreation Department; National Audubon Society (Arizona chapters); Dave Ritchie, Rio Verde Ranch; Marilyn Ethelbah and Tudor Montague, Salt River Pima-Maricopa Indian Community; John Keane and David Haynes, Salt River Project; Stefanie White, San Carlos Apache Tribe; J.T. Hesse, Steve Blair, and Aaron Alvidrez, U.S. Air Force (Luke Air Force Base); Amy Heuslein, U.S. Bureau of Indian Affairs; Ted Cordery, U.S. Bureau of Land Management; Henry Messing, Nicole Olsker, and Mark Santee, U.S. Bureau of Reclamation; Greg Beatty and Mary Richardson, U.S. Fish and Wildlife Service; Janie Agyagos, Jim Copeland, Noel Fletcher, Steve Lohr, Gen Masters, Amyann Madera, Vicente Ordonez, Heidi Planke, Henry Provencio, Albert Sillas, Linda Whitetrifaro, and Todd Willard, U.S. Forest Service; Robin Brean, Verde Canyon Railroad; Cynthia Dale, White Mountain Apache; Elisabeth Burgard, Barbara Jewett, and Bill Van Pelt, Arizona Game and Fish Department. A special thanks goes out to winter count coordinators and volunteers for their hard work and dedication.

This report, in part, summarizes the results of monitoring by the Arizona Bald Eagle Nestwatch Program using the breeding area (BA) reports submitted in 2006. Those include: Kathy Ramsey and Curtis Prescott, Bartlett BA; Jean Carpenter and Emily Coulter, Box Bar BA; Joe Peddie and Marta Peddie, Crescent BA; Mark Read and Kristin Ward, Ladders BA; David Janssen and John Clare, Lynx/Lake Pleasant BAs; Jenny Henning and Alene Nelson, Needle Rock BA; Jeanne Parker and Clare Welch, Orme/Granite Reef BA; Andrea Meadows and Elizabeth Ray, Pinto BA; Anna Young and Joan Wike, San Carlos BA; Barbara Stein and Geni Gellhaus, Suicide BA; Gwyn Woolley-Scott and Thomas Magarian, Tonto BA; Audrey Clark and Santiago Galvis, Tower BA.

PROJECT FUNDING

Funding for this project was provided by: Arizona's Nongame Wildlife Checkoff; the Arizona Game and Fish Department's Heritage Fund; Arizona Public Service; Federal Highways; Geo-Marine Inc.; Salt River Project; San Carlos Apache Tribe; State Trust Fund Grants; U.S. Bureau of Land Management; U.S. Bureau of Reclamation; U.S. Department of Defense (Luke Air Force Base); U.S. Forest Service (Coconino, Prescott, and Tonto National Forests); U.S. Fish and Wildlife Service (State Wildlife Grant); and Verde Canyon Railroad.

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ARIZONA BALD EAGLE MANAGEMENT PROGRAM 2006 SUMMARY REPORT

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INTRODUCTION

In 1978, the U.S. Fish and Wildlife Service (USFWS) listed the bald eagle (*Haliaeetus leucocephalus*) as endangered under the Endangered Species Act as amended (1973) in 43 states (including Arizona), and threatened in 5 others (USFWS 1982). In Alaska, the USFWS did not list the species and it does not occur in Hawaii. The USFWS downlisted the bald eagle to threatened in 1995 (USFWS 1995), and has proposed to delist in the future (USFWS 1999, 2006). Until delisting, the bald eagle remains protected under the Endangered Species Act. Thereafter, the Airborne 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. Today, the members include: Arizona Game and Fish Department (AGFD), Arizona Public Service (APS), Arizona State Parks Department, Army Corps of Engineers, Canyon De Chelly National Monument, Fort McDowell Yavapai Nation, Geo-Marine (U.S. Air Combat Command), Hopi Tribe, Maricopa County Parks and Recreation Department (MCPRD), Navajo Nation, Salt River Pima-Maricopa Indian Community (SRPMIC), Salt River Project (SRP), San Carlos Apache Tribe (SCAT), Sonoran Joint Venture, 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 (NPS), and White Mountain Apache Tribe.

Prior to 2004, the Arizona Bald Eagle Management Program annually provided 3 separate technical reports summarizing the Arizona Bald Eagle Winter Count, Arizona Bald Eagle Nest Survey, and the Arizona Bald Eagle Nestwatch Program (ABENWP). Herein, 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 bald eagle breeding areas (BAs) are in central Arizona between elevations of 329 m (1080 ft) and 1341 m (4400 ft). They are primarily 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 (*Platanus 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 (*Prosopis* spp.),

ironwood (*Olneya tesota*), saguaro (*Carnegiea gigantea*), teddy bear cholla (*Opuntia bigelovii*), juniper (*Juniperus* spp.), and pinyon pine (*Pinus edulis*). Eight BAs are located outside of Sonoran Riparian Scrubland areas (Brown 1994). The Becker BA is within the Plains and Great Basin Grassland biome where the nest is in an isolated patch of Fremont cottonwoods. Canyon De Chelly, Crescent, Dupont, Lower Lake Mary, Luna, Lynx, and Rock Creek BAs are in Rocky Mountain and Madrean Montane Conifer Forest, where riparian vegetation includes narrow-leaf cottonwood (*Populus angustifolia*), thin-leaf alder (*Alnus tenuifolia*), Bebb's willow (*Salix bebbiana*), and coyote willow (*S. exigua*) (Brown 1994). Dupont and Rock Creek are located in patches of Rocky Mountain and Montane Conifer Forest surrounded by Interior Chaparral, consisting mainly of pinyon-juniper woodland, shrub live oak (*Quercus turbinella*), and pointed (*Arctostaphylos pungens*) and pringle manzanita (*A. pringlei*). Canyon De Chelly BA is located in a Rocky Mountain Conifer forest surrounded by Great Basin Desertscrub, consisting mainly of sagebrush (*Artemisia tridentata*), blackbrush (*Coleogyne ramosissima*), and shadscale (*Atriplex confertifolia*).

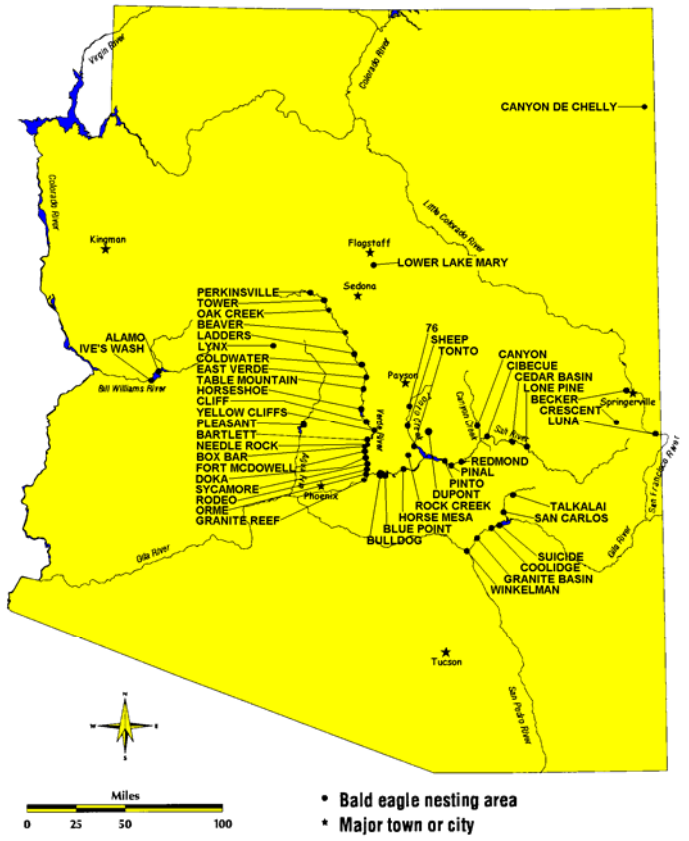


Figure 1. Location of known bald eagle BAs in Arizona, 2006.

Except in 2 BAs (Dupont and Rock Creek), bald eagles in Arizona 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 (USFWS 1999, 2006), 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. 2005). In 1995, AGFD and the NWF established 115 standardized routes for Arizona's bald eagle winter count. In 2005, after 10 years of surveying the 115 established routes, we analyzed the data to eliminate those routes that were not productive and to include new routes for future surveys. If a route produced 3 or fewer birds during the past 10 years of surveys, the route was dropped per USGS protocol. As a result, in 2006 we dropped 23 and added 12 new routes to the survey for a net result of 104 routes. The U.S. Geological Survey Biological Division, Snake River Field Station (USGS), now coordinates the national winter count effort.

METHODS

We completed all of the established 104 standardized survey routes for the 2006 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 4 to 10, 2006, which included weekdays for agency personnel and a weekend for volunteers. The short survey period minimizes the chance for any large-scale bald eagle movements between survey routes and related duplicate counts.

We used a variety of survey methods due to the diverse habitats in Arizona, and our desire to maximize (but not duplicate) statewide coverage in a narrow period with minimal effort. The best method to survey the rugged terrain and deep canyons of linear drainage is by helicopter. USBR and SRP contributed a total of 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. Highways, large lakes, and point counts were surveyed by boats, vehicles, and on foot. We solicited surveyors from cooperating agencies and volunteers from private groups. We supplied survey forms from the USGS, and instructed participants on the National Survey Protocol.

We classified the bald eagle sightings into adult and subadult age classes. In addition, we include unknown eagle sightings in our totals in order to maintain consistency with the national count. We advised the volunteers to be aware of the various near-adult plumages as they may be easily mistaken for full adult bald eagles. We also recorded sightings of golden eagles (*Aguila chrysaetos*) during the survey, but did not report them in this document. We divided the data into 2 sections for comparison: 1) the terrestrial survey by county, and 2) the helicopter survey (Appendix A).

RESULTS AND DISCUSSIONS

The 2006 Arizona bald eagle winter count tallied 323 bald eagles (Table 1). We documented 239 adults (74.0%), 77 subadults (23.8%), and 7 unknown eagles (2.2%). The highest total number of bald eagles (n=128) occurred in Coconino County, especially on the lakes southeast of Flagstaff (n=55; route 28), specifically Mormon Lake and Upper and Lower Lake Mary. A notable number of bald eagles occurred along the lower Black River as well (n=27). An additional 10 bald eagles were counted on non-standardized routes (Appendix A).

Due in large part to mild winter weather with little to no snowfall leading up to the 2006 winter count, Arizona completed all of the 104 standardized routes this year. Unlike last year, participants were able to access routes that are sometimes partly inaccessible due to winter storms. Ice cover on northern lakes also was overall less than usual. Surveyors spent a total of 10,074 minutes (167.9 hours) searching (Table 2). The greatest survey effort was in Coconino County, where volunteers searched for 4,492 minutes (74.9 hours) with 0.0285 bald eagles observed per minute (1.7 bald eagles/hour).

Due to our refinement of the statewide winter count routes in 2005, 4 counties are no longer surveyed by ground methods for wintering bald eagles. These include Greenlee, Maricopa, Pima, and Pinal counties. Greenlee, Maricopa, and Pinal counties are surveyed for wintering bald eagles, in part, by the helicopter flights.

The total of 323 bald eagles counted is equivalent to the average of 322 birds annually during the period 1995-2005. This winter the ratio of adults to subadults was 3:1, exceeding the average of 2:1 in the counts from 1981 to 1985 and 1992 to 2005, when adults averaged 64.1%, subadults 33.0%, and unknown 2.9% (Table 2). The high percent of adults this year (74.0%) is above the national average of 67% adults reported from 1986-2000 (Steenhof et al. 2002). This is the highest adult ratio ever recorded during Arizona bald eagle winter count surveys.

Table 1. Summary of the Arizona bald eagle winter count 2006.

County	Routes	Minutes	Adult	Subadult	Unknown	Total	Total/Minute
Verde River drainage	3	233	18	6	0	24	0.103
Salt River drainage	9	379	64	11	0	75	0.198
Gila River drainage	9	216	11	5	0	16	0.074
Various helicopter	4	11	3	0	0	3	0.273
Apache	15	498	14	0	0	14	0.028
Cochise	2	210	1	0	1	2	0.009
Coconino	34	4492	92	35	1	128	0.028
Graham	1	200	4	5	4	13	0.065
Mohave	3	1063	10	5	0	15	0.014
Navajo	16	682	17	8	0	25	0.037
Santa Cruz	1	90	0	0	0	0	0
Yavapai	6	1910	5	1	1	7	0.004
Yuma and La Paz	1	90	0	1	0	1	0.011
Totals	104	10,074	239	77	7	323	0.032

Table 2. Summary of Arizona bald eagle winter counts 1981-1985, 1992-2006.						
Year	Survey Time	Birds/minute	Adults	Subadults	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
2006	10,074[4]	0.0315	239 (74%)	77 (24%)	7 (2%)	323
Average	8,971	0.0383	179 (65%)	89 (32%)	7 (3%)	276

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

MANAGEMENT RECOMMENDATIONS

1. Maintain the current 104 standardized routes.
2. Add new routes for areas with consistent sightings of more than 3 bald eagles.
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 the breeding population in Arizona. Timely discovery of BAs also identifies sensitive areas requiring proactive management to prevent potentially adverse impacts.

In 1972, concern about 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. 2005). The AGFD administered and performed the 2006 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 2005 (e.g. Jacobson et al. 2005). We also investigated reports of bald eagles and nests by other agencies, biologists, and the public. A 2 to 3 person team conducted surveys between January and June 2006. 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. 2005).

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 bald eagle nests and locations in Arizona. The terms "small" and "short" refer to structures of inadequate height and size.

RESULTS

We examined all known BAs (n=50) for breeding activity (Fig. 1). Of 43 occupied BAs, 39 pairs attempted to breed, and 28 pairs successfully produced 42 fledglings (Table 3, Appendix C). Significant findings of the 2006 nest survey include 3 new bald eagle BAs, 6 new alternate bald eagle nests and 1 fallen nest within BAs, 1 new large nest in a historic breeding area, 2 new large nests in new locations, and 1 new BA in California (near the Arizona border).

Table 3. Summary of Arizona bald eagle productivity 2006.

Number of BAs	50	Number of Active BAs	39
Number of Occupied BAs	43	Number of Failed Breeding Attempts	11
Number of Eggs	68	Number of Successful Breeding Attempts	28
Nest Success = 28 /43	0.65	Number of Young Hatched	55
Mean Brood Size = 42 /28	1.50	Number of Young Fledged	42
		Productivity = 0.65*1.50	0.98

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)

Anderson Mesa. – Biologists believed a second pair of bald eagles may have established a BA on Anderson Mesa. On June 20, we searched the lakes for bald eagle activity. We saw no bald eagles or nests at Horse Lake (little water), Marshall Lake (little water), Ashurst Lake (one osprey was seen), Long Lake (dry, near Ashurst Lake), and Yaeger Lake. One adult bald eagle was perched by Kinnikinick Lake; a small raptor nest was found in tall trees away from the lake. Another adult was perched at Tremaine Lake, which holds a lot of water along with nearby Long, Soldier Annex, and Soldier lakes. One osprey nest was found in the ravine north of this complex of lakes. We will continue to monitor these areas for possible bald eagle breeding activity.

Beaver Creek. – In 1994, the breeding pair at Camp Verde abandoned the breeding area when their nest was lost during the 1993 floods. We have searched the BA for many years expecting a pair to reestablish in this habitat. On January 9, we found a large nest in a cottonwood tree near the Verde River/Beaver Creek confluence (4.5 river miles upstream of the location of the Camp Verde nest location) and saw 2 adult bald eagles in the area. On February 3, 1 adult was incubating in the nest. This is a new breeding area (Beaver BA) located on private property, and landowner indicated that the bald eagles have nested there for the past several years. The adult female was not a banded bird, however the male was blue VID banded "8/A" (1997 Tonto nestling).

Canyon de Chelly. – In March, we were contacted by Elaine Leslie, NPS (Acting Superintendent, Canyon de Chelly National Monument) regarding a bald eagle nest within the monument. During a ground visit on May 30, we verified this new BA (Canyon de Chelly BA), assessed the nest tree condition for the possibility of banding the 2, 6-week-old, nestlings, and identified both adult bald eagles as unbanded.

Copper Basin. – In 1996, reports from Metropolitan Water District lead us to survey Gene Wash and Copper Basin reservoirs just west of Parker Dam in California for bald eagles. We found 2 adults and a new nest on Gene Wash Reservoir, but never observed breeding activity. Since then, we have periodically surveyed the reservoirs, looking for sign of breeding activity. This year, we received reports of bald eagles in the area of Lake Havasu, Gene Wash, and Copper Basin Reservoirs. On June 20, we surveyed the area and found 2 bald eagle fledglings and a large nest in a small tree located at Copper Basin Reservoir. We will coordinate with the California Fish and Game Department to monitor this BA, which is about 40 miles from the nearest bald eagle BA in Arizona (Ive's Wash).

Pinto Creek. – In January, we received reports of a dead bald eagle along Pinto Creek. On January 19, we collected the carcass of an adult female bald eagle blue VID banded "8/M" (1997 Blue Point nestling) and egg fragments indicating egg production. However this individual was not known to occupy any BA. After confirming occupancy at the surrounding BAs, we surveyed Pinto Creek upstream from Roosevelt Lake on February 7 and March 20 for an additional

Roosevelt Lake BA. On March 20, we found a new large cliff nest (#1) not in use. No bald eagles were seen.

Topock Marsh. – On June 20, we surveyed the cottonwood stands surrounding the Topock Marsh area. Although no bald eagles or large nests were found, many of the trees in this area are large enough to support a bald eagle nest. We will continue to periodically survey this area.

Table 4. 2006 Arizona bald eagle nest survey summary, new locations.

Location	Date	Survey Method	Results
Anderson Mesa Lakes	6/20	Helicopter	One adult at Kinnikinick Lake. One adult at Tremaine Lake. One osprey nest at Long Lake.
Ashurst/Hayden	3/20	Helicopter	No new nests and no bald eagles.
Bear Canyon Lake	4/26	Helicopter	No new nests or bald eagles.
Beaver Creek	1/9, 2/3	Helicopter	1/9- Large nest and 2 adults in area. 2/3- New BA with 1 adult incubating in new nest #1.
Black Canyon Lake	4/26	Helicopter	One osprey in area. No bald eagles.
Canyon de Chelly	5/30	Ground	5/30- New BA with 2 nestlings 6 weeks old. Two adults nearby.
Canyon Lake	1/11	Helicopter	No new nests. 1/11- One subadult bald eagle in area.
Copper Basin	6/20	Helicopter	Two fledglings observed near large nest #2.
Del Rio Ponds	1/9	Helicopter	No new nests and no bald eagles.
Gleason Flat	2/7	Helicopter	No new nests and no bald eagles
Lake Mead	6/20	Helicopter	No new nests and no bald eagles
Lake Mohave	6/20	Helicopter	No new nests and no bald eagles
Pinto Creek	2/7, 3/20	Helicopter	No bald eagles. 3/20- One new large cliff nest #1.
Salt/Gila River Confluence	1/9	Helicopter	No new nests. 1/9- One subadult bald eagle in area.
Seneca Lake	3/20	Helicopter	No new nests and no bald eagles.
Tanks Canyon	3/20	Helicopter	No new nests and no bald eagles.
Topock Marsh	6/20	Helicopter	No new nests and no bald eagles

Historical Breeding Areas (Table 5)
Hell Point. – On February 3 we found a golden eagle incubating in nest #5.

Upper Lake Mary. – No bald eagles, but 2 active osprey nests (#1 and new #2) were found in snags on south side of lake on June 20.

Table 5. 2006 Arizona bald eagle nest survey summary, historical BAs.

Location	Date	Survey Method	Results
Ash	3/20	Helicopter	No new nests and no bald eagles.
Camp Verde	1/9, 2/3, 3/24	Helicopter	One active red-tailed hawk nest.
Chino	2/3	Helicopter	No new nests or bald eagles.
Devil's Post	2/3	Helicopter	All known nests empty. No bald eagles.
Havasu	6/20	Helicopter	No new nests and no bald eagles
Hell Point	2/3	Helicopter	Active golden eagle nest #5. 2/3- One adult incubating.
Mule Hoof	1/5, 2/7, 3/20	Helicopter	All known nests empty. No bald eagles.
Upper Lake Mary	6/20	Helicopter	Two pairs of ospreys incubating.

Survey sites with Existing Large Nests (Table 6)
Alchesay. – A golden eagle was found incubating in one of the cliff nests on March 20, but the nest was empty on subsequent visits.

Mormon Pocket. – A golden eagle was found incubating in the nest on March 24.

Muldoon. – One adult bald eagle was perched in the area on January 3. The ORA flight on February 3 yielded 4 adult and 6 subadult bald eagles in the river canyon between Hell Point historical BA and the Muldoon nest site. We will continue to monitor this area.

Watson Lake. – A golden eagle pair was incubating in the nest on March 24.

Yellow Cliffs. – After 1994, the Cliff BA no longer showed signs of breeding activity, although the breeding adults consistently occupied the BA. Extensive annual surveys from the north end of Bartlett Lake to Horseshoe Dam never revealed the occupied nest. In 2005, a large nest with new construction was found on a pinnacle east of Yellow Cliffs on Bartlett Lake and 1 adult bald eagle was observed. In April, a hiker reported a bald eagle nest along a nearby creek leading to the lake. On April 28 we confirmed the presence of the new nest #2, which is in a small cottonwood tree off of the main channel, and saw 1 adult perched in the nest with a 5 week old nestling. The adult male was blue VID banded "12/R" (2000 Pinal nestling) and the female was unbanded. This is the same individual that was identified in the Yellow Cliffs area with a second unbanded adult on October 17, 2004, which lead to the discovery of the pinnacle nest #1 in early 2005.

Table 6. 2006 Arizona bald eagle nest survey summary, nest sites.

Location	Date	Survey Method	Results
Alchesay Canyon	3/20	Helicopter	3/20- One golden eagle incubating in cliff nest.
Cottonwood Wash	2/7, 3/20	Helicopter	All known nests empty. No bald eagles.
Eagle	1/6	Helicopter	No new nests and no bald eagles.
Fossil Creek	3/24, 4/28	Helicopter	All known nests empty. 3/24- One adult bald eagle at the confluence with Verde River.
Gene Wash	6/20	Helicopter	All known nests empty. No bald eagles.
Granite	2/3, 4/28, 5/19	Helicopter	All known nests empty. No bald eagles.
Knoll Lake	4/26	Helicopter	No bald eagles. Osprey incubating in nest #1.
LF	1/9	Helicopter	No new nests and no bald eagles.
Mormon Pocket	3/24	Helicopter	3/24- One golden eagle incubating in large nest.
Muldoon	2/3, 3/24, 4/28, 5/19	Helicopter	All known nests empty. 2/3- One adult bald eagle in area.
RR Tunnel	4/28	Helicopter	No new nests or bald eagles.
Sullivan	2/3, 3/24, 4/28	Helicopter	No bald eagles. 4/28- Three GHO nestlings in nest.
Sullivan Lake	2/3, 3/24, 4/28	Helicopter	No new nests and no bald eagles.
Watson Lake	2/3, 3/24	Helicopter	No bald eagles. 2/3- Two golden eagles nest building. 3/24- One golden eagle incubating nest #1.
West Clear Creek	3/24, 4/28	Helicopter	No new nests and no bald eagles.
Woods Canyon Lake	4/26	Helicopter	No bald eagles.4/26- One osprey incubating in nest #3.
Willow	1/6	Helicopter	No new nests. One subadult bald eagle in area.
Willow Springs Lake	4/26	Helicopter	No bald eagles. One osprey incubating in nest below dam.
Yellow Cliffs	1/9, 2/3, 3/24, 4/28	Helicopter Ground	4/28- One adult perched with 1, 5 week old nestling in new nest #2.

Breeding Areas (Table 7)
Alamo – During the winter count on January 12, 1 adult was found incubating in a new willow tree nest #7.

Box Bar – On January 9, we found 1 adult incubating in a new snag nest #4.

Ladders – During a ground visit on February 28, an active new cliff nest #8 was located downstream of Chasm Creek.

Lower Lake Mary – We observed a pair of unbanded, territorial adult bald eagles copulating on February 25. During the ORA flight on March 24 it was evident that they were not using nest #1, which was in poor condition. On May 11, a ground survey located the new active nest #2 in a live ponderosa pine approximately 1.5 miles upstream from nest #1. The new nest is placed near Upper Lake Mary, perhaps because of the dwindling water level of Lower Lake Mary.

Luna – Nestwatchers reported that severe winds broke several branches from the nest tree and disrupted incubation on February 16. The adults did not return to the nest although 1 adult remained in the area. We assessed the damage during a ground visit on February 17, and found some branches had fallen into the nest, and several freshly broken limbs had collapsed to the ground. The nest remained intact, however, and a second attempt at breeding failed before April 16.

Oak Creek – On the January 9 winter count, we found 2 adult bald eagles near a new nest in a large cottonwood tree, and on February 3, 1 adult was incubating in the new nest #4.

Rodeo – On February 7, an adult was observed incubating in a new cottonwood tree nest #3. Nestwatchers reported that the nest fell on April 21. A ground visit on April 24 revealed that the nest had only partially fallen and that the nestling had survived. It was perched safely in a nearby tree and was near fledging age.

Table 7. 2006 Arizona bald eagle nest survey summary, BAs.

Location	Date	Survey Method	Results
Alamo	1/12	Ground Helicopter	1/12- One adult incubating in new nest #7. Second adult in area.
Becker	2/17	Ground	All known nests empty. No bald eagles.
Box Bar	1/9	Helicopter	1/9- One adult incubating in new nest #4.
Canyon	1/11, 2/7, 3/20	Helicopter	All known nests empty. No bald eagles.
Cedar Basin	1/5, 2/7, 3/20	Helicopter	All known nests empty. 1/5- Two adult bald eagles in area. 3/20- One adult in area.
Cliff	1/9, 2/3, 3/24, 4/28	Helicopter	All known nests empty. 2/3- Two adult bald eagles below Horseshoe Dam.
Dupont	4/26	Helicopter	All known nests empty. No bald eagles.
Granite Basin	2/7, 3/20	Helicopter	All known nests empty. No bald eagles.
Ladders	1/9, 2/3, 3/24	Helicopter	3/24 – One adult brooding in new nest #8.
Lower Lake Mary	2/25, 3/24, 5/11	Ground Helicopter	2/25- Pair of adults copulating. A third adult and at least 5 subadults in area. 5/11- New nest #2.

Table 7. continued

Location	Date	Survey Method	Results
Luna	2/17	Ground	2/17- Confirmed that strong winds damaged nest tree and caused failure on 2/16.
Oak Creek	1/9, 2/3,	Helicopter	1/9- New nest #4. Two adults in area. 2/3- One adult incubating in new nest.
Pleasant	1/9, 2/3,	Helicopter	2/3- One adult standing in nest #2 with new nest lining.
Rock Creek	2/7, 3/20, 4/26, 5/15	Helicopter	All known nests empty. 3/20- One adult in area.
Rodeo	1/9, 2/7, 4/24	Helicopter Ground	2/7- Adult incubating in new nest #3. Second adult in area. 4/24- Nest #3 partially fell.
Sheep	1/11, 2/7, 3/20, 4/26	Helicopter	1/11- One adult at nest #1. 3/20- Two adults perched in nest #4. Nest with formed egg cup.
Table Mountain	1/9, 2/3, 3/24, 4/28	Helicopter	All known nests empty. 2/3- One adult perched in repaired nest #4. 4/28- Two adults in area.
Winkelman	2/7, 3/20	Helicopter	All known nests empty. No bald eagles.

Overview

Significant findings of the 2006 nest survey include: 3 new bald eagle BAs, 6 new alternate bald eagle nests and 1 fallen nest within BAs, 1 new large nest in a historic breeding area, 2 new large nests in new locations, and 1 new BA in California near the Arizona border.

Two new BAs, Beaver and Yellow Cliffs (Fig. 2), were found along the Verde River between other active BAs. The third new BA, found at Canyon de Chelly in the northeastern corner of the state, represents a key discovery. This BA is approximately 150 miles from the next closest BA in Arizona and may represent a link with bald eagle populations in the other states of the Four Corners region. Unfortunately both adults at this new site were unbanded, and we were unable to climb the nest tree to band the nestlings.

Figure 2. Nestling at newly discovered Yellow Cliffs BA, Maricopa County, Arizona. Photo by K. McCarty.

Similarly, the new nest and fledglings at Copper Basin Reservoir, just over the state line in California, could possibly be an expansion from either the Ive's Wash or Alamo BAs. A ground visit to the nest is needed to determine the origin of the adults at Copper Basin.

The Mogollon Rim has received special attention during nest surveys over the last several years because of reports of bald eagles at Bear Canyon, Chevelon Canyon, Knoll, Willow Springs, and Woods Canyon lakes. One adult eagle was seen at Chevelon during a survey flight in June 2003, and 1 adult at Willow Springs during a flight in May 2004. This year all of these lakes were surveyed except Chevelon (due to high wind). We found no bald eagles, however Ospreys were nesting at Knoll, Willow Springs, and Woods Canyon lakes. Additional sightings of adult bald eagles on Anderson Mesa at Kinnikinick and Tremaine lakes this year suggest that nest surveys and exploration of the Mogollon Rim and Plateau should continue.

We also surveyed the Colorado River, particularly around Lake Havasu, Topock Marsh, Lake Mohave and Lake Mead up to and including the Overton Arm. Although there are several stands of trees and suitable habitat at Topock Marsh, as well as abundant cliffs near Havasu and around Lake Mead, no bald eagles and no new nests were found in Arizona. With the identification of the BA in California near Lake Havasu and the apparent expansion of BAs across Arizona, continued surveys of this river corridor are warranted.

The continued creation and loss of alternate nests, coupled with the expansion and distribution of bald eagles in Arizona, 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 to accurately 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 may extend into Sonora, Mexico, Southern California, and western New Mexico. Identifying breeding bald eagles, through banding, visual identification and transmitters would clarify the extent to which the bald eagles hatched in Arizona reach into these surrounding areas, and would help to accurately estimate survivorship.
3. Determine the identification of the breeding pair at Copper Basin, CA and yearly band the nestlings.
4. Surveyors should continue to use the nest survey, ORA, and winter count flights, in concert with follow-up ground surveys to inspect areas. From the air, surveyors can easily cover large sections of bald eagle habitat. Follow-up ground surveys thoroughly investigate an area.
5. Reinforce Rodeo nest #3 to prevent nestling loss.
6. Examine the following areas for breeding bald eagles and/or nests:
    - Agua Fria River drainage – Up and downstream from Lake Pleasant.
    - Anderson Mesa Lakes – Ashurst Lake, Deep Lake, Horse Lake, Kinnikinick Lake, Long Lake, Marshall Lake, Potato Lake, Prim Lake, Tremaine Lake, Yaeger Lake.
    - Big Sandy River drainage – Upper Trout Creek.
    - 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 and 2 Maricopa Audubon Society volunteers monitored 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 or reduce the threat.

In this report, we summarize significant discoveries at each monitored BA in 2006. 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 (Bartlett, Box Bar, Ladders, Luna, Lynx, Needle Rock, Pinto, Pleasant, San Carlos, Tonto, and Tower), those without (Crescent, Orme, and Suicide), and those monitored for opportunistic information (Granite Reef). In the fall of 2005, 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 information and the ABENWP's role in bald eagle management, and an explanation of data forms and emergency protocols. After the orientation meetings, the contactors chose a partner, a BA, and were taken into the field. The question and answer sessions occurred after the first 10-

day work period, and 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 10, 2006, 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 and/or lake kilometer (rk/lk) designations, and a guide to commonly taken fish species. They recorded all bald eagle data on supplied field forms. Nestwatchers provided their own transportation, gas, field supplies, binoculars, and housing on days off.

Within an arbitrary 1.0 km (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, Box Bar, and Needle Rock BAs, nestwatchers recorded human activity differently than described above. They recorded compliance with the Pleasant BA closure 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 15 BAs in 2006. Those include: Bartlett, Box Bar, Crescent, Granite Reef, Ladders, Luna, Lynx Lake, Needle Rock, Orme, Pinto, Pleasant, San Carlos, Suicide, Tonto, and Tower. The final status of monitored BAs was 1 occupied, 3 failed, 11 successful, and 19 young fledged (Appendix C).

The Granite Reef BA was monitored opportunistically by nestwatchers at an adjacent BA, and the Luna BA was only briefly monitored prior to failure; therefore, data for these BAs are not included in this report. Complete summaries for the remaining 13 BAs are discussed below and reported in Appendices E-Q.

Bartlett Breeding Area (Appendix E)

Observation Period. – February 10 to May 25. Total monitoring 77 days/781 hours.

Figure 3. Bartlett BA. Maricopa County, Arizona. Photo by J. Driscoll.

Bald Eagle Identification. – The male is unbanded and in adult plumage. The female is blue VID banded "6/H" on her left leg, USFWS banded on the right leg, and in adult plumage (Tonto 1995 nestling).

Management Activities. – 1) The USFS enacted the seasonal BA closure. 2) One female nestling was VID banded "20/A" after pre-fledging at 11 weeks of age.

Interventions. – On May 20, 2006, a 10 week old Bartlett nestling left the nest before it could fly. The nestling was found below the nest in good physical condition. We banded the nestling and placed it on a perch near the river (the active nest is inaccessible). ABENWP contractors monitored the nestling until it was able to fly on May 25.

Human Activity. – Nestwatchers recorded 297 human activities. Aircraft activity (small planes, helicopters, and jets) represented 83.5%, terrestrial activity of 6 different types represented 10.4%, and watercraft (canoes/kayaks, boaters, and rafters) 6.1%. One activity elicited a significant response from the breeding pair. The bald eagles were restless to 1 canoe/kayak.
Food Habits. – Nestwatchers observed 43 forage attempts. The male was successful in 100% (n=29) and the female in 92.9% (n=14). Of these attempts, fish accounted for 81.4%, mammals 7.0%, and unknown 11.6%. The breeding pair delivered 81 prey items to the nest. The male delivered 70.4% and the female 29.6%. The common prey type was fish (42.0%), although mammals (3.7%) were also taken. Of these prey deliveries, 53.1% were unknown prey types and none were identified to species.

Habitat Use. – The Bartlett nestwatchers identified 46 separate perch locations that spanned a 1.8 km stretch of the Verde River ranging from rk 34.2 to 36.0. The pair spent 45.0% of their time at rk 35.0, 13.7% at rk 34.7, 13.3% at rk 34.2, 10.8% at rk 34.8, and 17.2% at the remaining perch locations.

Box Bar Breeding Area (Appendix F)

Figure 4. Box Bar BA in 1999. Maricopa County, Arizona. Photo by J. Driscoll.

Figure 5. Box Bar BA during floods of February 2005. Maricopa, County, Arizona. Photo by J. Driscoll.

Observation Period. – February 10 to April 30. Total monitoring 89 days/521 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.

Human Activity. – Nestwatchers recorded 8 human activities within the closure. Terrestrial activities of 5 different types represented 75.0% and aircraft (small planes) represented 25.0%. No activities elicited significant responses by the breeding pair.

Food Habits. –The breeding pair delivered 17 prey items to the nest. The male delivered 47.1% and the female 52.9%. The common prey type was fish (76.5%), although mammals (11.8%) were also taken. Of these prey deliveries, 11.8% were unknown prey types and none were identified to species.
Habitat Use. – The Box Bar nestwatchers identified 12 separate perch locations that spanned a 1.9 km stretch of the Verde River ranging from rk 23.1 to 25.0. The pair spent 42.7% of their time at rk 24.6, 16.7% at rk 23.1, 12.1% at rk 24.1, 11.0% at rk 23.9, and 17.5% at the remaining perch locations.

Crescent Breeding Area (Appendix G)
Observation Period. – February 18 to April 2. Total monitoring 30 days/190 hours.

After the early failure of the Luna BA, the ABENWP contractors were reassigned to the Crescent BA.

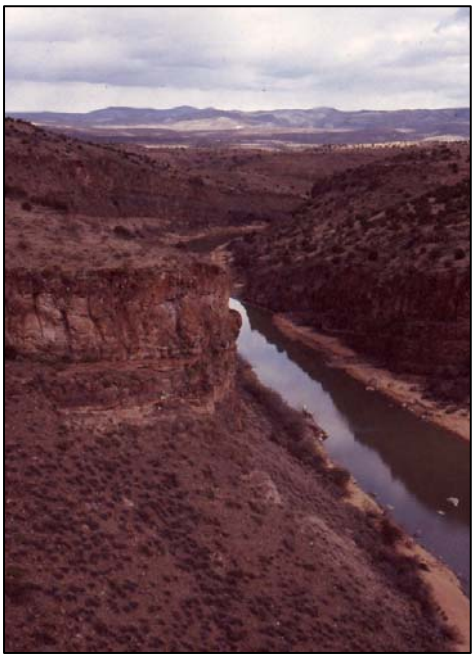
Management Activities. – 1) ABENWP contractors were housed at the Big Lake USFS housing area.

Human Activity. – During their short monitoring period, nestwatchers recorded 122 human activities. Shore fishermen accounted for 87.7%, watercraft (boats and float tubers) 11.5%, and aircraft (small planes) for 0.8%. One of these activities elicited 7 significant responses from the breeding pair. The bald eagles were restless in response to 4 shore fishermen and flushed in response to 3 shore fishermen.

Food Habits. – Nestwatchers observed 18 forage attempts. The male was successful in 100% (n=9) and the female in 88.9% (n=9). Of these attempts, 44.4% were for fish, 11.1% mammals, 5.6% birds, and 38.9% for unknown prey types. The breeding pair delivered 8 prey items to the nest. The male delivered 62.5% and the female 37.5%. The common prey types consisted of 62.5% fish and 37.5% unknown prey types. No prey deliveries were identified to species.

Habitat Use. – The Crescent nestwatchers identified 15 separate perch locations around Crescent Lake. Perches spanned a total of 0.6 km ranging from lk 2.0 to 2.6. The pair spent 33.4% of their time at lk 2.4, 30.2% at lk 2.1, 16.3% at lk 2.2, and 20.1% at the remaining perch locations.

Ladders Breeding Area (Appendix H)
Observation Period. – February 10 to June 16. Total monitoring 79 days/548 hours.



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

Management Activities. – 1) The USFS enacted a seasonal BA 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 "19/V" and "19/W" at 5.5 weeks of age, respectively.

Figure 6. Ladders BA. Yavapai County, Arizona. Photo by J.Driscoll.

Human Activity. – Nestwatchers recorded 165 human activities. Watercraft (canoes/kayaks and rafters) represented 91.5%, aircraft (small planes, helicopters, and ultra-lights) 4.8%, and terrestrial activities (agency workers and ranchers) 3.6%. One activity elicited 3 significant responses from the breeding pair. The bald eagles flushed in response to 2 agency workers and left the area in response to 1 agency worker.

Food Habits. – Nestwatchers observed 11 forage attempts. The male was successful in 20.0% (n=5) and the female in 33.3% (n=6). Of these attempts, 36.4% were for fish, 18.2% birds and mammals each, and 27.3% for unknown prey types. The breeding pair delivered 45 prey items to the nest. The male delivered 77.8% and the female 22.2%. The common prey types consisted of 66.7% fish, 8.9% mammals, 4.4% birds and reptiles each, and 15.6% unknown prey types. Of the 10 items that could be identified to species, 90.0% were carp (*Cyprinus carpio*) and 10.0% rock squirrel (*Spermophilus variegatus*).

Habitat Use. – The Ladders nestwatchers identified 124 perch locations along the Verde River. River perches spanned a total of 3.6 km ranging from rk 159.9 to 163.5. The pair spent 31.4% of the observed time at rk 161.9, 18.1% at rk 161.8, 12.2% at rk 161.7, 12.1% at rk 162.0, 9.1% at rk 161.2, and 17.1% at the remaining perches.

Lynx Breeding Area (Appendix I)
Observation Period. – March 24 to May 5. Total monitoring 30 days/560 hours.

The Lake Pleasant nestwatchers were moved to Lynx Lake after the Pleasant breeding pair failed to breed.

Bald Eagle Identification. – The male is VID banded "9/C" on his left leg, USFWS banded on the right leg, and in adult plumage (1998 Pleasant nestling). The female is VID banded "6/M" on her left leg, USFWS banded on the right leg, and in adult plumage (1995 Pinto nestling).

Figure 7. Lynx BA. Yavapai County, Arizona. Photo by J. Driscoll.

Management Activities. – 1) The USFS enacted the seasonal BA closure. 2) The male and female nestlings were VID banded "18/Z" and "18/X" at 5 weeks of age.

Human Activity. – Nestwatchers recorded 25 human activities during their short monitoring period. Aircraft (small planes and helicopters) represented 52.0%, terrestrial activities (hikers and fisherman) and watercraft (canoes/kayaks, boats, and rafters) represented 24.0% each. No activities elicited significant responses from the breeding pair.

Food Habits. – Nestwatchers observed 5 forage attempts. The male was unsuccessful in his 1 attempt, the female was successful in her 1 attempt, and an unknown adult was unsuccessful in all 3 attempts. The most common forage item was fish 60.0%, although birds and unknown prey types 20.0% each were also hunted. The breeding pair delivered 35 prey items to the nest. The male delivered 31.4%, the female 57.1%, and an unknown adult 11.4%. Birds composed 17.1% of those items, 14.3% fish and mammals each, 5.7% carrion, and 48.6% unknown prey types. No prey items were identified to species.

Habitat Use. – The Lynx nestwatchers identified 5 separate perch locations around the lake, a high use area, and a low use area. The pair almost entirely used the east side of the lake (within the closure).

Needle Rock Breeding Area (Appendix J)
Observation Period. – February 10 to May 23. Total monitoring 96 days/599 hours.

Figure 8. Needle Rock BA. Maricopa County, Arizona. Photo by J. Driscoll.

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

Management Activities. – 1) The USFS enacted the seasonal BA closure. 2) Prior to the breeding season, USFS and AGFD removed the Africanized bee colony from the nest tree and filled the cavities to prevent future colonization. 3) The owners of Rio Verde Ranch allowed ABENWP contractors to camp on their lawn. 4) ABENWP contractors were active in educating the public visiting the Needle Rock Recreation Area. 5) The male and female nestlings were banded "19/D" and "19/C" at 5 weeks of age.

Human Activities. – Nestwatchers recorded 46 human activities. Aircraft of 4 different types represented 60.9%, terrestrial activities of 9 different types 34.8%, and watercraft (canoes/kayaks) 4.3%. Four activities elicited 5 significant responses. The breeding pair vocalized in response to 1 small plane, flushed in response to 1 hiker and researcher each, and left the area in response to 1 helicopter and hiker each.

Food Habits. – Nestwatchers observed 11 forage attempts. The male was successful in his only attempt, the female in 71.4% (n=7), and an unknown adult in 100% (n=3). The most common forage item was fish 54.5%, mammals 27.3%, and unknown prey types 18.2%. The breeding pair delivered 18 prey items to the nest. The male delivered 16.7%, female 61.1%, and an unknown adult 22.2%. Fish composed 50.0%, mammals 33.3%, and unknown prey types 16.7%. No prey items were identified to species.

Habitat Use. – The Needle Rock nestwatchers identified 26 separate perch locations along the Verde River. River perches spanned a total of 4.2 km ranging from rk 25.3 to 29.5. The pair spent 35.4% of their time at rk 26.1, 13.1% at rk 28.4, 11.9% at rk 25.5, 7.6% at rk 25.7, 6.6% at 28.7, and 25.4% at the remaining perch locations.

Orme Breeding Area (Appendix K)
Observation Period. – February 10 to May 22. Total monitoring 73 days/658 hours.

Figure 9. Orme BA. Maricopa County, Arizona. Photo by J.Driscoll.

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) The male and female nestlings were VID banded "19/E" and "19/H" at 6 weeks of age, respectively.

Interventions. – On May 21, 2006, a 12 week old Orme nestling was found on the ground near the SRP water treatment plant. We recovered the nestling the next morning in poor condition and transferred it to Liberty Wildlife Rehabilitation for treatment. The nestling would not eat and therefore was tube fed 4 times a day. On the morning of May 28, the nestling died in captivity.

Human Activity. – Nestwatchers recorded 225 human activities. Aircraft of 5 different types represented 65.8%, terrestrial activities of 11 different types 26.7%, and watercraft (rafters, tubers, canoes/kayaks) 7.6%. Eleven activities elicited 35 significant responses by the breeding pair. The bald eagles were restless to 7 helicopters, 2 Apache helicopters, and 1 driver, agency worker, and hiker each. The breeding pair flushed in response to 9 helicopters, 4 hikers, 2 agency workers, and 1 driver, tuber, motorized parachute, researcher, fisherman, biker, and birder each. The breeding pair left the area in response to 1 helicopter.

Food Habits. – Nestwatchers observed 52 forage attempts. The male was successful in 61.5% (n=26) attempts and the female in 57.7% (n=26). The most common forage item was fish 53.8%, birds 25.0%, reptiles and amphibians 1.9% each, and unknown prey types 17.3%. The breeding pair delivered 56 prey items to the nest. The male delivered 53.6% and the female 46.4%. Fish composed 62.5%, reptiles and amphibians 5.4%, birds 3.6%, and unknown prey types 28.6%. Of the 8 items that could be identified to species, 75.0% were suckers (*Catostomus and Pantosteus spp.*) and 12.5% were carp and American wigeon (*Anas americana*) each.

Habitat Use. – The Orme nestwatchers identified 44 separate perch locations along the Verde and Salt Rivers. River perches spanned a total of 12.5 km ranging from rk 0.3 to 1.6 on the Verde River and rk 4.1 to 15.3 on the Salt River. The pair spent 65.7% of their time at rk 0.4 (Verde River), 8.5% at rk 0.6 (Verde River), and 25.8% at the remaining perch locations.

Pinto Breeding Area (Appendix L)
Observation Period. – February 10 to April 16. Total monitoring 50 days/399 hours.

Bald Eagle Identification. – The male is blue VID banded "5/D" on his left leg, USFWS banded on the right leg, and in adult plumage (1994 Blue Point nestling). The female is blue VID banded "2/H" on her left leg, USFWS banded on the right leg, and in adult plumage (1991 Alamo nestling).

Management Activities. – 1) The Southwestern Willow Flycatcher (*Epidonax traillii extimus*) 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) USFS enacted the seasonal bald eagle closure. 4) AGFD provided USFS a boat to use while educating the public and enforcing the closure.

Figure 10. Pinto BA. Gila County, Arizona. Photo by J.Driscoll.

Human Activity. – Nestwatchers recorded 62 human activities. Terrestrial activities of 4 different types accounted for 77.4%, watercraft (boats, canoes/kayaks, and jet skis) 19.4%, and aircraft (helicopters) 3.2%. No significant responses were elicited from the breeding pair.

Food Habits. – Nestwatchers observed 6 forage attempts. The male was successful in 100% (n=2), the female in 100% (n=2), and an unknown adult in 50% (n=2). Of these attempts, 100% were for fish. The breeding pair delivered 38 prey items to the nest. The male delivered 60.5% and the female 39.5%. Prey items consisted of 100% fish. No prey items were identified to species.

Habitat Use. – The Pinto nestwatchers identified 42 separate perch locations on the Salt River arm of Lake Roosevelt. Perches spanned a total of 6.5 km ranging from rk 100.0 to 106.5. The breeding pair spent 50.1% of the time at rk 104.3, 21.3% at rk 104.6, 17.3% at rk 104.4, and 11.3% at the remaining perch locations.

Pleasant Breeding Area (Appendix M)
Observation Period. February 10 to March 19. Total monitoring 30 days/277 hours.

The Pleasant breeding pair exhibited signs of pre-nesting activity for the duration of nestwatcher observation, but failed to lay eggs. The contractors were moved to the Lynx BA.

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.

Figure 11. Pleasant BA. Maricopa County, Arizona. Photo by J.Driscoll.

Human Activity. – Nestwatchers recorded 500 human activities. Watercraft (boats, jet skis, and water skiers) represented 83.4% and aircraft of 4 different types 16.6%. The only significant

response elicited from the breeding pair was by 1 boat that caused the adults to flush. Of the 412 watercraft that approached the southern buoy line, only 24 (5.8%) did not comply (agency boats omitted). Boats represented 95.8% of those non-complying, and 4.2% jet skis. Within the type of watercraft, only 6.2% (n=395) of the boats and 5.9% (n=17) of the jet skis did not comply with the closure. Of these violations, 58.3% occurred on a weekend.

Food Habits. – Nestwatchers observed 4 forage attempts. The male was unsuccessful in his 1 attempt, the female was successful in 50% (n=2), and an unknown adult was unsuccessful in 1 attempt. No prey items were delivered to the nest or identified to species.

Habitat Use. – The Pleasant nestwatchers identified 13 separate perch locations along the Agua Fria arm of Lake Pleasant. Perches spanned a total of 0.6 km ranging from rk 68.8 to 69.4. The breeding pair spent 48.8% of the time at rk 68.9, 28.2% at rk 68.8, and 23.0% at the remaining perch locations.

San Carlos Breeding Area (Appendix N)
Observation Period. – February 10 to May 15. Total monitoring 63 days/526 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 on her left leg, USFWS banded on the right leg, and in adult plumage (probably the 1989 Bartlett nestling).

Figure 12. San Carlos BA. Gila County, Arizona. Photo by J.Driscoll.

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 149 human activities. Terrestrial activities of 11 different types accounted for 93.3% and aircraft (jets, helicopters, and small planes) accounted for 6.7%. Six activities elicited 7 significant responses from the breeding pair. The bald eagles were restless to 1 OHV and jet each, flushed in response to 2 researchers and 1 gunshot, and left the area in response to 1 driver and hiker each.

Food Habits. – Nestwatchers observed 3 forage attempts. The male was successful in 66.7% (n=3). Foraging attempts consisted of 33.3% fish, birds, and reptiles each. The breeding pair delivered 67 prey items to the nest. The male delivered 71.6% and the female 28.4%. Of the delivered items, 35.8% were fish, 7.5% mammals, 3.0% reptiles, 1.5% birds, and 52.2% unknown prey types. Of the 13 items that could be identified to species, 38.5% were channel catfish (*Ictalurus punctatus*), 15.4% suckers, and 7.7% black crappie (*Pomoxis nigromaculatus*), carp, goldfish (*Carassius auratus*), American coot (*Fulica Americana*), western cottontail (*Syvilagus sp.*), and garter snake (*Thamnophis sp.*) each.

Habitat Use. – The San Carlos nestwatchers identified 7 separate perch locations along the San Carlos River. River perches spanned a total of 0.4 km ranging from rk 10.8 to 11.2. The breeding pair spent 55.7% of the time at rk 11.1, 42.4% at rk 11.0, and 1.9% at the remaining perch locations.

Suicide Breeding Area (Appendix O)
Observation Period. – February 10 to May 15. Total monitoring 73 days/719 hours.

Bald Eagle Identification. – The male is blue VID banded "4/M" on his left leg, USFWS banded on the right leg, and in adult plumage (1993 Blue Point nestling). The female is blue VID banded on her left leg, USFWS banded on the right leg, and in adult plumage.

Figure 13. Suicide BA. Gila County, Arizona. Photo by J.Driscoll.

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) One male nestling was black VID banded "Triangle/E" at 9 weeks old.

Interventions. – A 9 week old Suicide nestling left the nest before it could fly on May 9, 2006 (its 2 siblings died in the nest earlier that week). We captured the nestling on May 10, re-hydrated, banded, and placed it in an alternate nest (the active nest is inaccessible). On May 15, the nestling was recovered dead below the nest.

Human Activity. – Nestwatchers recorded 3,967 human activities (of which 2,717 were cars traveling on the highway below the nest). Terrestrial activities of 5 different types accounted for 71.3%, watercraft (boats and jet skis) 26.1%, and aircraft of 4 different types 2.5%. Two activities elicited 4 significant responses from the breeding pair. The bald eagles were restless to 3 agency workers and flushed in response to 1 gunshot.

Food Habits. – Nestwatchers observed 93 forage attempts. An unknown adult was successful in 89.2% of the attempts. Foraging attempts consisted of 75.3% fish, 16.1% mammals, 6.5% carrion, and 1.1% birds and reptiles, each. The breeding pair delivered 83 prey items to the nest. The male delivered 53.0% and the female 47.0%. Of the delivered items, 75.9% were fish, 14.5% mammals, 7.2% carrion, and 1.2% birds and reptiles, each. Of the 63 items that could be identified to species, 39.7% were black crappie and largemouth bass (*Micropterus salmoides*) each, 15.9% carp, and 4.8% channel catfish.

Habitat Use. – The Suicide nestwatchers identified 49 separate perch locations around San Carlos Reservoir. Perches spanned a total of 1.7 km ranging from lk 0.3 to 2.0. The breeding pair spent 39.0% of the time at lk 0.5-0.6, 30.8% at lk 0.6-0.7, 29.0% at lk 0.7-0.8, and 1.2% at the remaining perch locations.

Tonto Breeding Area (Appendix P)
Observation Period. – February 11 to May 23. Total monitoring 74 days/671 hours.

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

Figure 14. Tonto BA. Gila County, Arizona. Photo by J.Driscoll.

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) The USFS enacted the seasonal bald eagle closure.

Human Activity. – Nestwatchers recorded 64 human activities. Watercraft (boats, canoes/kayaks, and jet skis) accounted for 53.1%, aircraft of 5 different types 32.8%, and terrestrial activity of 6 different types 14.1%. Three activities elicited 9 significant responses from the breeding pair. The bald eagles were restless in response to 1 boat, flushed in response to 1 helicopter, and protectively soared over the BA in response to 1 boat and 6 motor-parachutes.

Food Habits. – The nestwatchers observed 30 forage attempts. The male was successful in 77.3% (n=22), the female in 80.0% (n=5), and they were 66.7% successful when hunting in tandem (n=3). Of these forage attempts, 73.3% were fish, 13.3% birds, and 6.7% mammals and unknown prey types, each. The breeding pair delivered 102 prey items to the nest. The male delivered 66.7% and the female 33.3%. Fish comprised 81.4% of those items, 5.9% birds, 3.9% mammals, and 8.8% unknown prey types. Of the 46 prey items identified to species, 32.6% were black crappie, 23.9% carp, 21.7% largemouth bass, 8.7% American coots, 4.3% channel catfish and smallmouth bass (*Micropterus dolomieue*) each, and 2.2% small pan fish (*Lepomis spp.*) and great blue herons (*Ardea herodias*) each.

Habitat use. – The Tonto nestwatchers identified 33 separate perch locations along Tonto Creek. River perches spanned 9.5 km ranging from rk 9.5 to 19.0. The breeding pair spent 53.4% of the observed time at rk 16.9, 34.1% at rk 16.7, and 12.5% at the remaining perch locations.

Tower Breeding Area (Appendix Q)
Observation Period. – February 10 to May 28. Total monitoring 81 days/668 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 (1989 Ladders 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 2 male nestlings were VID banded "19/M" and "19/N" at 6 and 4.5 weeks of age, respectively.

Figure 15. Tower BA. Yavapai, County, Arizona. Photo by J.Driscoll.

Interventions. – On May 8, 2006, a 9 week old Tower nestling was recovered on the ground below the nest. The nestling had been pulled off the nest by an adult as it left the nest carrying a fish the nestling held in its talons. We recovered the nestling and returned it to the nest noting a moderate infestation of Mexican chicken bugs. The nestling died in the nest on May 13 and was recovered. On May 12, 2006, the second 9.5 week old Tower nestling left the nest before it could fly. We rescued the emaciated and dehydrated nestling the same day and transferred it to Liberty Wildlife Rehabilitation on May 13. We returned the nestling on May 18, and began daily supplemental feeding of the adults through the ABENWP. The nestling left the nest shortly after placement and remained missing for 10 days. On May 28, the nestling was found healthy and flying.

Human Activity. – Nestwatchers recorded 317 human activities. Terrestrial activities of 11 types represented 90.5%, aircraft (small planes and helicopters) 9.1%, and canoes/kayaks 0.3%. Four activities elicited 13 significant responses from the breeding pair. The bald eagles were restless to 3 researchers and flushed to 8 trains and 1 maintenance car and helicopter, each.

Food Habits. – Nestwatchers observed 6 forage attempts. The male was not successful in his 2 observed attempts, the female was successful in 50% (n=2), and an unknown adult was successful in 100% (n=2). All of these forage attempts were for fish. The breeding pair delivered 34 prey items to the nest. The male delivered 35.3%, the female 58.8%, and an unknown adult 5.9%. Fish comprised 47.1%, birds 11.8%, mammals 5.9%, and unknown prey types 35.3%. Of the 4 prey types that were identified to species, 50% were rabbits and 25% channel catfish and carp, each.

Habitat Use. – The Tower nestwatchers identified 73 separate perch locations along the Verde River. River perches spanned a total of 13.8 km ranging from 237.0 to 250.8. The pair spent 19.6% of the observed time at rk 248.1, 18.2% at rk 248.4, 11.9% at rk 248.0, 10.0% at rk 248.5, 8.6% at rk 247.3, and 31.7% at the remaining perch locations.

OTHER INTERVENTIONS

Bulldog Breeding Area

On May 13, 2006, a member of the public brought in a 9 week old nestling from the Bulldog BA to Liberty Wildlife Rehabilitation. The nestling was recovered on the ground, near the river, in front of its nest. The nestling tested positive for lead poisoning and was chelated for 24 days. On June 6, we fostered the 12.5 week old nestling into the active Granite Reef nest (the active Bulldog nest is inaccessible). The resident adults accepted the foster.

Granite Reef Breeding Area

While fostering the Bulldog nestling on June 6, 2006, we recovered the 12 week old Granite Reef nestling on the ground and unable to fly. We returned both nestlings to the nest the same day. On June 8, the nestling fledged.

MANAGEMENT CONSIDERATIONS

Bartlett Breeding Area

1. Check all signs and closure barriers prior to each breeding season.
2. Post a sign at the closure gate to prevent foot traffic.

Box Bar Breeding Area

1. Post signs at regular intervals along closure boundary.

Crescent Breeding Area

1. Implement a closure encompassing the entire west knoll above existing roads and facilities.
2. Continue education and outreach programs.
3. Institute a supplemental feeding program for this BA during harsh winter months.

Ladders Breeding Area

1. Improve closure signs throughout the breeding area.
2. Revise closure boundaries to include 1 km downstream of new nest.
3. Restrict cattle grazing in the area.

Lynx Breeding Area

1. Move buoys farther south.
2. Extend orange closure fence inland on the south end of the lake.
3. Open Goldwater Lake late during the bald eagle nesting season.

Needle Rock Breeding Area

1. Improve signs for closure.
2. Post closure signs at pay station.

Orme Breeding Area

1. Enforce no shooting along the Bush Highway and Phon D. Sutton Recreation area.
2. Restrict cattle and horse access to the riparian area.

Pinto Breeding Area

1. Continue regular visits by USFS personnel.
2. Continue enacting the water closure during high lake levels.
3. Increase public education by coordinating nestwatcher presentations at Roosevelt Lake visitor center.

Pleasant Breeding Area

1. Make buoys more distinctive by adding flags.
2. Increase emphasis on preventing aircraft disturbance.

San Carlos Breeding Area
1. Continue presentations at local schools.
2. Provide educational programs with paid internships to students for part-time observers during breeding season.
3. Continue and enhance trash clean-up efforts.
4. Post "No Dumping" signs along all access roads along the river.
5. Maintain posting and fencing of breeding area closure.

Suicide Breeding Area
1. Patrol the area of San Carlos Lake for firearm use during times of high recreation.

Tonto Breeding Area
1. Post signs at Indian Point boat ramp and other launch sites for motorized parachutes.
2. Institute a riparian regeneration project.

Tower Breeding Area
1. Post a "No Entering Closure" sign at the downstream end of closure directed towards hikers.
2. Replace all signs to clearly indicate allowed and banned uses.
3. On upstream end of closure, place "Entering Closure" sign in a more visible location.
4. Place a "No Stopping" sign at the USGS gaging station.
5. Place a "No Throwing Rocks" sign at nestwatcher campsite.
6. Trim or remove trees in front of existing signs prior to songbird nesting season.
7. Enforce grazing restrictions on the Verde River.

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APPENDIX A: 2006 ARIZONA BALD EAGLE WINTER COUNT RESULTS

Table 8. 2006 Arizona bald eagle winter count volunteer survey results.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Apache County						
1	Becker Lake	15	2	0	0	0
2	Little Colorado River (LCR)	10	1	0	0	0
3	S. Fork LCR – Campground	20	0	0	0	0
4	Casa Malapais – LCR	10	0	0	0	0
5	Greer Lakes (River, Bunch, and Tunnel Reservoirs)	30	5	0	0	0
6	Sponseller Lake	25	0	0	0	0
7	Mexican Hay Lake	30	0	0	0	0
8	White Mountain Hereford Ranch (Trinity, Glen Livet, McKay reservoirs)	40	0	0	0	0
9	The Ranch Lake	20	1	0	0	0
10	Ortega Lake	22	0	0	0	0
11	Concho Lake	29	1	0	0	0
12	Luna Lake	60	2	0	0	0
13	Nelson Reservoir	25	1	0	0	0
14	Nutrioso Reservoir	40	1	0	0	0
15	Tenney Pond	Dropped from standardized routes				
16	San Francisco River (Alpine RD to New Mexico	122	0	0	0	0
17	Campbell Blue Creek	Dropped from standardized routes				
Total		**498**	**14**	**0**	**0**	**0**
Cochise County						
18	Parker Canyon Lake	90	1	0	1	0
19	Willcox Playa	120	0	0	0	0
20	Sulphur Springs Valley – Whitewater Draw	Dropped from standardized routes				
Total		**210**	**1**	**0**	**1**	**0**
Coconino County						
21	Long Lake Complex	285	3	2	0	0
22	Stoneman Lake	189	3	2	0	1
23	FH-3	40	0	1	0	0
24	I-17, Section to Flagstaff	242	8	2	0	0
25	Bellemont	225	1	0	0	0
26	Townsend/Winona A & B	410	1	0	0	0
27	HWY 89 North /Sunset Crater – Wupatki	330	2	0	0	0
28	FH-3 Lakes (Mary, Mormon, Marshall, Ashurst, Prime, Kinnikinick)	585	39	16	0	0
29	Continental Country Club Lakes	105	1	0	0	0
30	Chevelon Canyon Lakes	225	3	0	0	0
31	Holden Lake	Dropped from standardized routes				
32	Spring Valley Wash	150	1	0	0	0
33	Red Lake Valley	15	1	0	0	0
34	Kaibab Lake	60	2	0	0	0
35	Pittman Valley	40	0	0	0	0
36	Davenport Lake	30	0	0	0	0
37	Scholz Lake	105	2	1	0	0

Table 8. continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Coconino County (continued)						
38	Cataract Lake	45	4	1	0	0
39	Willow Springs Lake	110	2	1	0	0
40	West Chevelon Canyon	75	0	0	0	0
41	Willow Creek	60	0	0	0	0
42	White Horse Lake – Pomeroy Tanks	35	2	2	0	0
43	JD Dam Lake	30	1	3	0	0
44	Barney Flat Wetland	Dropped from standardized routes				
45	Steel/Stone Road	55	1	0	0	0
46	Pine Flat	Dropped from standardized routes				
47	Boggy Tank	Dropped from standardized routes				
48	Blue Stem Wash-Babbit property	120	2	0	0	0
49	Glen Canyon Nat'l Rec. Area (Lee's Ferry)	45	1	0	0	0
50	Colorado River, Lee's Ferry to Little Colorado River	Dropped from standardized routes				
118	Bill Williams Loop Road	90	1	1	0	0
119	Johnson Canyon	80	1	3	0	0
120	Highway 64 east	20	1	0	0	0
121	Highway 64	27	2	0	0	0
122	Camp Navajo	70	1	0	0	0
123	Partridge Creek	240	2	0	0	0
124	Odell Lake	55	3	0	0	0
125	Highway 87 north	59	1	0	0	0
126	Highway 180	240	0	0	0	0
Total		**4492**	**92**	**35**	**0**	**1**
Graham County						
51	Point of Pines Lake Area	200	4	5	0	4
Greenlee County						
52	Grey's Peak	Dropped from standardized routes				
Maricopa County						
53	Painted Rock Reservoir	Dropped from standardized routes				
Mohave County						
54	Lake Mohave	533	3	2	0	0
55	Havasu National Wildlife Refuge, Topock Marsh	Dropped from standardized routes				
56	Lake Mead, Temple Bar	480	4	3	0	0
57	Alamo Lake	50	3	0	0	0
Total		**1063**	**10**	**5**	**0**	**0**
Navajo County						
58	Lake of the Woods	31	2	2	0	0
59	Rainbow Lake	95	4	2	0	0
60	Little Mormon Lake	Dropped from standardized routes				
61	Whipple Lake	12	0	0	0	0
62	Long Lake	35	2	1	0	0
63	Lone Pine Dam	10	0	0	0	0
64	Schoens Reservoir	23	0	0	0	0
65	White Mountain Lake	15	0	0	0	0
66	Dry Lake	Dropped from standardized routes				
67	Jacques Marsh	60	2	1	0	0
68	Scott's Reservoir	35	2	0	0	0

Table 8. continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Navajo County continued.						
69	Showlow Lake	70	2	1	0	0
70	Pintail Lake	23	1	0	0	0
71	Telephone Lake	20	1	0	0	0
72	Fool Hollow Lake	150	1	1	0	0
73	Fred's Lake	Dropped from standardized routes				
74	Edeler's Lake	Dropped from standardized routes				
75	Cottonwood Wash/ Clay Springs	53	0	0	0	0
76	White Lake	5	0	0	0	0
127	Mortenson Wash	45	0	0	0	0
Total		**682**	**17**	**8**	**0**	**0**
Pima County						
77	Arivaca Lake	Dropped from standardized routes				
Pinal County						
78	Picacho Reservoir	Dropped from standardized routes				
Santa Cruz County						
79	Bog Hole	Dropped from standardized routes				
80	Patagonia	Dropped from standardized routes				
81	San Raphael Valley	Dropped from standardized routes				
82	Pena Blanca Lake	90	0	0	0	0
Yavapai County						
83	Wet Beaver Creek	420	0	0	0	0
84	Oak Creek	540	2	0	0	0
85	Willow Lake	240	1	0	0	1
86	Lynx Lake	230	2	0	0	0
87	Watson Lake	240	0	0	0	0
88	Goldwater Lake	240	0	1	0	0
Totals		**1910**	**5**	**1**	**0**	**1**
Yuma and La Paz Counties						
89	Imperial N.W.R. Cibola/Martinez Lake – Colorado River	90	0	1	0	0

Table 9. 2006 Arizona bald eagle winter count helicopter survey results.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
90	Verde River	204	18	6	0	0
91	Lower East Verde River	12	0	0	0	0
92	Lower West Clear Creek	17	0	0	0	0
93	Lower Salt River	125	10	4	0	0
94	Upper Salt River	64	7	0	0	0
95	Lower Tonto Creek	30	5	0	0	0
96	Lower Cherry Creek	Dropped from standardized routes				
97	Lower Canyon Creek	7	0	0	0	0
98	Lower Cibecue Creek	11	1	0	0	0
99	Lower Carrizo Creek	Dropped from standardized routes				
100	White River	14	1	0	0	0
101	North Fork White River	38	8	2	0	0
102	Lower Black River	59	24	3	0	0
103	Big and Little Bonito Creeks	31	8	2	0	0
104	San Carlos River - Talkalai Lake	14	5	0	0	0
105	San Carlos Reservoir	26	2	2	0	0
106	Upper and Lower Gila River	38	0	0	0	0
107	Eagle Creek	32	1	1	0	0
108	Bonita Creek	17	0	1	0	0
109	Lower San Francisco River	34	1	0	0	0
110	Blue River	11	2	0	0	0
111	Sunrise Lake	3	1	0	0	0
112	Big Lake	3	1	0	0	0
113	Lee Valley Reservoir	Dropped from standardized routes				
114	Crescent Lake	2	1	0	0	0
115	Lake Pleasant	20	0	0	0	0
116	Del Rio Ponds	3	0	0	0	0
117	Tres Rios	24	0	1	0	0
Totals		**839**	**96**	**22**	**0**	**0**

Table 10. 2006 Arizona bald eagle winter count non-standardized route results.

Route Name	County	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Boggy Tank (47)	Coconino	65	1	0	0	0
Barney Flat (44)	Coconino	20	0	1	0	0
HWY 87 South (991)	Coconino	80	0	0	0	0
Blue Ridge (C.C. Cragin) Reservoir	Coconino	100	0	0	0	0
Kachina Sewage Treatment	Coconino	37	1	0	0	0
Hull Tank	Coconino	12	1	0	0	0
Russel Tank	Coconino	20	1	0	0	0
Lockett Lake	Coconino	15	0	0	0	0
Coconino Wash	Coconino	90	2	0	0	0
Cottonwood Wash	Navajo	48	2	1	0	0
Camp Verde (993)	Yavapai	35	0	0	0	0
Totals		**522**	**8**	**2**	**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.

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.

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

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

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

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: 2006 ARIZONA BALD EAGLE PRODUCTIVITY

Table 11. Arizona bald eagle breeding area productivity summary, 2006.

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Alamo	S	7	<1/12	1+	2/3-3/6	1	1	4/19-5/19
Bartlett*	S	2	1/9-2/3	2+	2/3-3/10	2	2	5/14, >5/28
Beaver	S	1	1/9-2/3	1	3/1-3/24	1	1	4/28-5/19
Becker	U							
Blue Point	S	10	1/11-2/7	2	2/7-3/9	1	1	>5/15
Box Bar*	S	4	<1/9	1+	2/7-2/28	1	1	5/1-5/4
Bulldog	F	1	<1/11	2+	2/7-3/20	2	Failed 5/14	
	One nestling died in nest before 5/14. Second nestling rehabbed for lead poisoning and fostered into Granite Reef on 6/6.							
Canyon	U							
Canyon De Chelly	S	1	<4/17	2+	<4/17	2	2	>6/20
Cedar Basin	O							
Cibeque	S	2	1/5-2/7	1	2/7-3/20	1	1	>5/15
Cliff	U							
Coldwater	S	3	1/9-2/3	1+	3/24-4/28	1	1	>5/19
Coolidge	F	2	2/7-3/10	2	Failed before 3/29.			
Crescent*	F	1	2/18-2/25	1	3/25	1	Failed 4/13	
	Nest failed after heavy snow storm.							
Doka	S	3	1/9-2/3	1+	2/3-3/24	1	1	3/24-4/28
Dupont	U							
East Verde	F	6	1/9-2/3	1+	Failed 3/24-4/25.			
Ft. McDowell	S	17	<1/9	2+	2/3-3/24	2	1	4/28-5/19
	One nestling last seen at 5.5 weeks old on 3/24.							
Granite Basin	U							
Granite Reef*	S	2	1/11-2/3	2	2/28-3/20	1	1, 1FOS	6/7
	Bulldog nestling fostered into the nest on 6/6 and fledged the same day.							
Horse Mesa	S	4	<1/11	1+	2/7-3/20	1	1	>5/15
Horseshoe	S	11	<1/9	3	2/3-3/6	3	1	4/28-5/19
Ive's Wash	F	3	<2/3	1	2/3-3/7	1	Failed 4/20-5/19	
	Nestling found dead below the nest on 5/23.							
Ladders*	S	8	2/3-2/28	2	3/24	2	2	6/5,6/16
Lone Pine	S	5	1/5-2/7	3	2/7-3/20	3	3	>5/15
Lower Lake Mary	S	2	<5/11	3	<5/11	3	3	>6/20
Luna*	F	1	<1/28	2	Failed 2/16 after heavy winds.			
	F	1	2/16-4/13	1+	Failed before 4/16.			
Lynx*	S	2	<2/3	2	2/3-2/28	2	2	4/29
Needle Rock*	S	2	1/9-2/3	2	2/3-3/3	2	2	5/19, 5/26
Oak Creek	S	4	1/9-2/3	1	2/3-3/1	1	1	4/28-5/19
Orme*	S	6	1/11-2/3	3	2/27	2	1	5/19
	One nestling died in rehab from unknown causes.							
Perkinsville	S	4	2/3-3/24	1+	3/24-4/28	1	1	>5/19
Pinal	F	2	2/7-3/7	2	3/20-4/26	1	Failed 4/26-5/8.	
	Nestling disappeared from nest at 5 weeks old.							
Pinto*	S	6	<1/11	2+	1/11-2/7	2	2	4/15
Pleasant*	O							
Redmond	F	5	2/7-3/20	1+	Failed 3/20-4/26.			

[1] Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.
[2] Nest numbers are from Hunt and others 1992; and subsequent NGTRs e.g. Jacobson and others 2005.
* 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
Rock Creek	U							
Rodeo	S	3	1/11-2/7	1+	2/7-3/24	1	1	4/21
San Carlos*	S	3	<1/11	2+	2/17	2	2	5/13, 5/14
76	F	4	2/7-2/23	1+	2/23-3/20	1	Failed 3/20-4/26.	
Sheep	O							
Suicide*	F	2	1/11-2/7	3	3/2	3	Failed 5/15.	
	Two nestling found dead in nest #2. Third nestling found dead below nest #1.							
Sycamore	S	4	<1/9	2+	1/9-2/3	2	2	3/24-4/25
Table Mountain	O							
Talkalai	F	7	1/11-2/7	2	Failed 4/1			
Tonto*	S	4	<1/11	2+	2/28-3/1	2	2	5/21, 5/23
Tower*	S	8	1/9-1/31	2	3/1, 3/3	2	1	5/18
	One nestling found dead in nest on 5/13.							
Winkelman	U							
Yellow Cliffs	S	2	<4/28	1	<4/28	1	1	>5/24

[1] Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.
[2] Nest numbers are from Hunt and others 1992; and subsequent NGTRs e.g. Jacobson and others 2005.
* 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, 2006		
Cibecue	1009	One adult perched in nest #2. Second adult in area.
Mule Hoof historical BA	1020	All known nests empty. No bald eagles.
Cedar Basin	1044	All known nests empty. Two adults in area.
Lone Pine	1046	All known nests empty. Two adults in area.
Crescent	1206	All known nests empty. One adult in area.
January 6, 2006		
Willow nest site	1005	No new nests. One subadult in area.
Eagle nest site	1033	No new nests or bald eagles.
January 9, 2006		
Rodeo	0801	All known nests empty. Two adults in area.
Sycamore	0803	One adult incubating in nest #4.
Doka	0806	Two adults perched in nest #2.
Fort McDowell	0808	One adult incubating in nest #17.
Box Bar	0814	One adult incubating in new nest #4.
Needle Rock	0816	All known nests empty. No bald eagles.
Bartlett	0821	All known nests empty. No bald eagles.
Yellow Cliffs	0846	Two adults upstream possibly building a new nest.
Cliff	0859	All known nests empty. No bald eagles.
Horseshoe	0900	One adult incubating in nest #11.
Table Mountain	0910	All known nests empty. No bald eagles.
LF Ranch	0931	No new nests and no bald eagles.
East Verde	1002	One adult perched at nest #6.
Coldwater	1016	Two adults perched in nest #3.
Ladders	1031	All known nests empty. Two adults flying in area.
Camp Verde Historical BA	1227	One Large nest in Cottonwood Tree.
Beaver Creek	1232	One Large nest and 2 adults in area.
Oak Creek	1244	One new nest #4. Two adults in area.
Tower	1317	All known nests empty. One subadult in area.
Perkinsville	1327	All known nests empty. No bald eagles.
Del Rio Ponds	1400	No new nests and no bald eagles.
Pleasant	1300	All known nests empty. No bald eagles.
Salt/Gila River Confluence	1602	No new nests. One subadult.
January 11, 2006		
Granite Reef	0802	One adult perched in nest #2. Second adult flying with sticks.
Orme	0804	All known nests empty. No bald eagles.
Bull Dog	0812	One adult standing in nest #1.
Canyon Lake	0824	One subadult bald eagle in area.
Horse Mesa	0848	One adult incubating in nest #4. Second adult in area.
Tonto	0905	One adult perched in nest #4.
Sheep	0918	One adult at nest #1.
76	0934	Two adults perched at nest #4.
Pinto	1159	One adult incubating in nest #6. Second adult in area.
Pinal	1207	All known nests empty. Two adults in area.
Redmond	1216	All known nests empty. One adult in area.
Canyon	1241	All known nests empty. No bald eagles.
Talkalai	1344	Two adults perched in nest #7.
San Carlos	1353	One adult standing over 1 egg in nest #3. Two more adults in area.
Suicide	1356	All known nests empty. No bald eagles.
Coolidge	1423	All known nests empty. No bald eagles.

Table 12. continued.

Location	Time	Comments
February 3, 2006		
Granite Reef	0803	One adult incubating in nest #2. Second adult in area.
Orme	0805	One adult incubating in nest #6.
Rodeo	0809	All known nests empty. No bald eagles.
Sycamore	0813	One adult brooding 1 2-week old nestling.
Doka	0816	One adult feeding young in nest #3. Second adult in area.
Fort McDowell	0818	One adult incubating in nest.
Box Bar	0823	One adult incubating in new nest. Second adult in area.
Needle Rock	0824	One adult incubating in nest #2.
Bartlett	0828	One adult incubating in nest #2.
Yellow Cliffs	0834	All known nests empty. One adult in area.
Cliff	0844	All known nests empty. Two adults below Horseshoe dam.
Horseshoe	0906	One adult incubating in nest with 2 eggs.
Table Mountain	0914	One adult perched in repaired nest #4.
East Verde	0922	One adult incubating in nest #6. Second adult in area.
Coldwater	0931	One adult incubating in nest #3.
Ladders	0938	All known nests empty. One adult in area.
Camp Verde historical BA	0947	One large nest in a cottonwood tree with an active red-tailed hawk nest.
Beaver Creek	0953	New BA with 1 adult incubating in new nest #1.
Oak Creek	1002	One adult incubating in new nest #4.
Tower	1106	One adult incubating in nest #8.
Perkinsville	1122	All known nests empty. One adult in area.
Hell Point historical BA	1137	One golden eagle incubating in nest #5.
Hell point to Muldoon	1140	Four adult and 6 subadult bald eagles.
Muldoon nest site	1146	All known nests empty. One adult in area.
Granite nest site	1150	All known nests empty. No bald eagles.
Sullivan nest site	1158	All known nests empty. No bald eagles.
Sullivan Lake nest site	1200	No new nests and no bald eagles.
Watson Lake	1214	Two golden eagles building nest #1.
Lynx	1221	One adult incubating in nest #2.
Devil's Post historical BA	1425	All known nests empty. No bald eagles.
Chino historical BA	1507	No new nests or bald eagles.
Alamo	1516	One adult incubating in new nest #6.
Ive's Wash	1522	One adult incubating in nest #3.
Pleasant	1606	One adult standing in nest #2 with new nest lining.
February 7, 2006		
Rodeo	0805	One adult incubating in new nest #3. Second adult in area.
Orme	0807	One adult incubating in nest.
Bulldog	0814	One adult incubating in nest #1.
Blue Point	0818	One adult incubating 2 eggs in nest #10. Second adult in area.
Horse Mesa	0829	One adult incubating in nest.
Rock Creek	0834	All known nests empty. No bald eagles.
Tonto	0838	One adult incubating in nest #4. Second adult in area.
Sheep	0845	All known nests empty. No bald eagles.
76	0852	All known nests empty. No bald eagles.
Pinto Creek	0916	No new nests and no bald eagles.
Pinto	0922	One adult feeding 1 2-week old nestling.
Pinal	0926	All known nests empty. No bald eagles.
Redmond	0930	All known nests empty. One bald eagle perched near nest #5.
Gleason Flat	0938	No new nests and no bald eagles.
Canyon	0948	All known nests empty. No bald eagles.
Cibecue	1104	One adult incubating in nest #2.
Mule Hoof historical BA	1107	All known nests empty. No bald eagles.

Table 12. continued.

Location	Time	Comments
February 7, 2006 continued		
Cedar Basin	1126	All known nests empty. Three adults in area.
Lone Pine	1132	One adult incubating in nest #5. Second adult in area.
Crescent	1200	Two adults perched in nest #1 tree.
Talkalai	1417	One adult incubating in nest #7.
San Carlos	1424	One adult incubating in nest.
Cottonwood Wash	1433	All known nests empty. No bald eagles.
Suicide	1435	One adult incubating in nest #2.
Coolidge	1442	Nest #2 rebuilt. No adults in area.
Granite Basin	1510	All known nests empty. No bald eagles.
Winkelman	1520	All known nests empty. No bald eagles.
March 20, 2006		
Granite Reef	0758	One adult brooding 1 1-week old nestling.
Bulldog	0803	One adult brooding 1 2-week old nestling.
Blue Point	0805	One adult brooding 1 2-week old nestling.
Fish Creek	0811	All known nests empty. No bald eagles.
Horse Mesa	0814	One 4.5-week old nestling in nest.
Alchesay nest site	0823	One golden eagle incubating in cliff nest.
Rock Creek	0830	Nest #2 empty. Nest #1 obscured by clouds. One adult in area.
Sheep	0841	Two adults perched in nest #4. Nest with formed egg cup.
76	0848	One adult incubating in nest #4.
Parker Canyon	0905	All known nests empty. No bald eagles.
Pinto Creek	0913	One new large nest. No bald eagles.
Pinal	0925	One adult incubating in nest #6.
Redmond	0929	One adult incubating in nest #5. Second adult in area.
Canyon	0947	All known nests empty. No bald eagles.
Lone Pine	1115	One adult incubating in nest. Second adult in area.
Cedar Basin	1124	All known nests empty. One adult in area.
Mule Hoof Historical BA	1132	All known nests empty. No bald eagles.
Cibecue	1141	One adult brooding in nest.
Seneca Lake	1319	No new nests and no bald eagles.
Tanks Canyon	1322	No new nests and no bald eagles.
Ash Historical BA	1327	No new nests and no bald eagles.
Talkalai	1346	One adult incubating in nest. Second adult in area.
Cottonwood Wash	1406	All known nests empty. No bald eagles.
Suicide	1408	One adult brooding 1 2-week old nestling. Second adult in area.
Coolidge	1414	One adult incubating in nest #2.
San Carlos	1424	Two 3.5 week old nestlings in nest. One adult in nest.
Granite Basin	1451	All known nests empty. No bald eagles.
Winkelman	1459	All known nests empty. No bald eagles.
Ashurst/Hayden	1515	No new nests and no bald eagles.
March 24, 2006		
Orme	0757	Two 3-week old nestlings in nest. One adult in area.
Rodeo	0759	One 6-week old nestling in nest. One adult in area.
Sycamore	0803	One adult perched at nest with 2 9-week old nestlings.
Doka	0807	One 7-week old nestling in nest. One adult in area.
Fort McDowell	0809	Two 5.5-week old nestlings in nest. Two adults in area.
Box Bar	0812	One 6-week old nestling in nest. One adult perched nearby.
Needle Rock	0814	Two 3-week old nestlings in nest. One adult perched nearby.
Bartlett	0818	One adult in nest with 2 2-week old nestlings.
Yellow Cliffs	0824	All known nests empty. No bald eagles.
Cliff	0832	All known nests empty. No bald eagles.
Horseshoe	0849	One 3-week old nestling in nest. One adult in area.

Table 12. continued.

Location	Time	Comments
March 24, 2006 continued		
Table Mountain	0901	Adult flew from nest #4. Nest empty.
East Verde	0909	One adult incubating in nest. Second adult in area.
Fossil Creek nest site	1054	One adult at confluence with Verde River.
Coldwater	0926	One adult incubating in nest.
Ladders	0930	One adult brooding in new nest #8.
West Clear Creek nest site	0940	No new nests or bald eagles.
Lower Lake Mary	1050	All known nests empty. One adult and 2 subadults in area.
Camp Verde historical BA	1254	One active red-tailed hawk nest. No bald eagles.
Beaver	1258	One adult perched in nest with 1 4.5-week old nestling.
Oak Creek	1304	One adult perched in nest with 1 3-week old nestling.
Tower	1312	One adult feeding 2 3-week old nestlings.
Mormon Pocket	1322	One golden eagle incubating in large nest.
Perkinsville	1327	One adult incubating in nest #4.
Hell Canyon	1340	No new nests or bald eagles.
Hell Point historical BA	1347	One golden eagle incubating in nest.
Muldoon nest site	1353	All known nests empty. Four subadult bald eagles in area.
Sullivan nest site	1403	All known nests empty.
Sullivan Lake nest site	1405	All known nests empty.
Watson Lake nest site	1419	One golden eagle incubating in nest #1.
Lynx	1424	Two 6-week old nestlings in nest.
Pleasant	1449	All known nests empty. No bald eagles.
April 26, 2006		
Bulldog	0849	Two 7-week old nestlings in nest.
Blue Point	0852	One 7-week old nestling in nest with 1 adult.
Horse Mesa	0905	One 9.5-week old nestling in nest.
Rock Creek	0910	All known nests empty. No bald eagles.
Sheep	0918	All known nests empty. No bald eagles.
76	0926	Nesting attempt failed.
Dupont	1010	All known nests empty. No bald eagles.
Alchesay nest site	1033	All known nests empty. No bald eagles.
Pinal	1043	One adult flushed from nest with 1 4.5-week old nestling. Second adult in area.
Redmond	1048	Nesting attempt failed.
Cibecue	1103	One adult perched in nest with 1 5.5 week old nestling.
Lone Pine	1123	Land to band 3 6-week old nestlings.
Black Canyon Lake	1523	One osprey in area. No bald eagles.
Willow Springs Lake nest site	1533	One osprey incubating in nest below dam.
Woods Canyon Lake nest site	1537	One osprey incubating in nest #3. No bald eagles.
Bear Canyon Lake	1540	No new nests or bald eagles.
Knoll Lake nest site	1545	One osprey incubating in nest #1.
April 28, 2006		
Granite Reef	0734	One adult perched in nest with 1 6.5-week old nestling. Second adult in area.
Orme	0735	Two 8-week old nestlings in nest. One adult in area.
Rodeo	0737	Nest #3 partially fallen. No bald eagles in area.
Sycamore	0743	Two fledglings in area.
Doka	0748	One adult and 1 fledgling perched in area.
Fort McDowell	0755	One 10-week old nestling in nest. Two adults in area.
Box Bar	0759	One 11-week old nestling in nest.

Table 12. continued.

Location	Time	Comments
April 28, 2006 continued.		
Needle Rock	0800	One adult and 2 8-week old nestlings eating in nest.
Bartlett	0805	One adult perched above nest with 2 7-week old nestlings.
Yellow Cliffs	0818	One adult perched with 1 5-week old nestling in new nest #2.
Cliff	0825	All known nests empty. No bald eagles.
Horseshoe	0833	One 8-week old nestling in nest. One adult in area.
Table Mountain	0844	All known nests empty. Two adults in area.
East Verde	0850	Nesting attempt failed.
Fossil Creek nest site	0905	All known nests empty. No bald eagles.
Coldwater	0913	One 6-week old nestling in nest. One adult in area.
West Clear Creek nest site	0945	No new nests or bald eagles.
Beaver	1008	One 9-week old nestling in nest.
Oak Creek	1019	One 8-week old nestling in nest.
Tower	1152	Two 7.5-week old nestlings in nest.
Mormon Pocket	1159	Two 3-week old golden eagle nestlings in nest.
Perkinsville	1204	One 5.5 week old nestling in nest.
RR Tunnel nest site	1206	No new nests or bald eagles.
Hell Canyon	1232	No new nests or bald eagles.
Hell Point historical BA	1239	One adult GE perched in nest with 1 4.5-week old nestling.
Muldoon nest site	1250	All known nests empty. No bald eagles.
Granite nest site	1259	All known nests empty. No bald eagles.
Sullivan nest site	1303	Three great horned owl nestlings in nest.
Sullivan Lake nest site	1305	No new nests or bald eagles.
Watson Lake nest site	1316	One adult golden eagle perched in nest with 2 3-week old nestlings.
May 15, 2006		
Bulldog	0818	One 9-week old nestling dead in nest. One adult in area.
Blue Point	0825	One 10-week old nestling standing on nest rim.
Horse Mesa	0834	One 12-week old nestling standing in nest.
Rock Creek	0844	All known nests empty. No bald eagles.
Alchesay nest site	0852	All known nests empty.
Pinal	0901	Nesting attempt failed.
Cibecue	1055	One adult perched in nest with 1 9-week old nestling.
Lone Pine	1108	Three 8-week old nestlings in nest.
Suicide	1230	Two nestlings dead in nest. Third nestling dead near road.
May 19, 2006		
Granite Reef	0731	One adult perched in nest tree. One 9-week old nestling in nest.
Rodeo	0735	One fledgling flying in area.
Ft McDowell	0751	One adult and 1 fledgling in area.
Box Bar	0757	One adult and 1 fledgling in area.
Needle Rock	0802	One nestling fledged and 1 11-week old nestling in nest. Two adults in area.
Bartlett	0808	One adult and 1 10-week old nestling in nest.
Yellow Cliffs	0813	One 7.5-week old nestling in nest. One adult in area.
Horseshoe	0830	One adult in area.
Coldwater	0848	One 9-week old nestling in nest. One adult in area.
Ladders	0853	Two 9-week old nestlings in nest.
Beaver	0902	One adult and 1 fledgling in area.
Oak Creek	0911	One fledgling in area.
Tower	0950	All known nests empty. Two adults in area.
Mormon Pocket	1004	Two 5-week old golden eagle nestlings in nest.

Table 12. continued.

Location	Time	Comments
May 19, 2006 continued		
Perkinsville	1006	One 8-week old nestling in nest.
Hell Point historical BA	1017	One golden eagle nestling near fledging.
Muldoon nest site	1023	All known nests empty. No bald eagles.
Granite nest site	1026	All known nests empty. No bald eagles.
Alamo	1318	Two adults and 1 fledgling in area.
Ive's Wash	1328	Two adults in area. Nest empty.
June 20, 2006		
Gene Wash nest site	0902	All known nests empty. No bald eagles.
Copper Basin	0911	Two fledgling bald eagles flying near new nest #2.
Havasu historical BA	0920	No new nests or bald eagles.
Topock Marsh	1000	No new nests or bald eagles.
Lake Mohave	1030	No new nests or bald eagles.
Lake Mead	1112	No new nests or bald eagles.
Lower Lake Mary	1430	Three 12-week old nestlings in new nest #2. One adult in area.
Upper Lake Mary historical BA	1440	Two pairs of Osprey incubating.
Anderson Mesa Lakes	1440	One adult at Kinnikinick Lake. One adult at Tremaine Lake. One Osprey nest at Long lake.

APPENDIX E: BARTLETT BREEDING AREA SUMMARY

Table 13. Observed human activity and bald eagle behavior, Bartlett BA, Arizona, 2006.

Human Activity	None	Watched	Restless	Total	Percent
Small planes	191	--	--	191	64.3
Helicopters	54	2	--	56	18.9
Canoes/kayaks	11	1	1	13	4.4
Agency workers	10	--	--	10	3.4
Fishermen	5	3	--	8	2.7
Hikers	8	--	--	8	2.7
Boaters	2	1	--	3	1.0
OHVs	3	--	--	3	1.0
Rafters	2	--	--	2	0.7
Hunters	1	--	--	1	0.3
Jets	1	--	--	1	0.3
Researchers	1	--	--	1	0.3
Total	289	7	1	297	

Table 14. Observed forage events and success, Bartlett BA, Arizona, 2006.

Sex	Fish		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	25	25-0	2	2-0	2	2-0	29	29-0
Female	10	10-0	1	1-0	3	2-1	14	13-1
Total	35	35-0	3	3-0	5	4-1	43	42-1

[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, Bartlett BA, Arizona, 2006.

Sex	Fish	Mammals	Birds	Unknown	Total	Percent
Male	25	2	--	30	57	70.4
Female	9	1	1	13	24	29.6
Total	34	3	1	43	81	
Percent	42.0	3.7	1.2	53.1		

Table 16. Bald eagle habitat analysis at the Bartlett BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	H_2O Type[3]
34.2a	SB	Right	No	RU
34.2b	SB	Right	No	RU
34.3a	CF	Right	Yes	RI
34.3b	CF	Right	Yes	RI
34.3c	CF	Right	Yes	RU
34.4a	CF	Right	Yes	RI
34.4b	GR	Right	Yes	RI
34.4c	CF	Right	Yes	RI
34.4d	CF	Right	Yes	RI
34.4e	CF	Right	Yes	RU
34.4f	CF	Right	Yes	RI
34.4g	CF	Right	Yes	RI
34.4h	CF	Right	Yes	RI
34.4i	CF	Right	Yes	RU
34.4j	CT	Right	Yes	RU
34.4k	CF	Right	Yes	RI
34.4l	CF	Right	Yes	RI
34.5	CF	Right	Yes	RI
34.6a	CF	Right	Yes	RU
34.6b	CF	Right	Yes	RI
34.6c	CF	Right	Yes	RI
34.6d	CF	Right	Yes	RI
34.6e	CF	Right	No	RI
34.7a	CF	Right	Yes	RU
34.7b	CF	Right	Yes	RI
34.8a	CF	Right	Yes	RU
34.8b	CF	Right	Yes	RU
34.8c	CF	Right	Yes	RI
34.8d	CF	Right	Yes	RU
34.9a	CT	Right	Yes	RU
34.9b	CF	Right	No	RU
34.9c	CF	Right	Yes	RU
34.9d	SS	Right	No	RU
34.9e	CF	Right	Yes	RU
34.9f	CT	Right	No	RI
35.0a	PT	Right	No	RB
35.0b	NE	Right	No	RB
35.0c	CF	Right	Yes	RB
35.0d	SS	Right	No	--
35.1a	BA	Right	No	RI
35.1b	SO	Left	Yes	RU
35.1c	CT	Right	Yes	RU
35.1d	SH	Right	No	RU
35.1e	CF	Right	Yes	RU
35.3	CT	Right	Yes	RU
36.0	BO	Left	No	RU

[1]River kilometers (Hunt et. al. 1992).
[2]SB=sand bar, CF=cliff face, GR=ground, CT=cliff top, SS=snag, shrub, PT=pinnacle top, NE=nest, BA=cut bank, SO=shore, SH=hard snag, BO=boulder.
[3] RU=run, RI=riffle, RB=river bend.

Table 17. Bald eagle habitat use at the Bartlett BA, Arizona, 2006.											
River km	PW[1,2]	PP	PH	PU	DW	CL	ES	PD	PR	Total	Percent
34.2	1,978	61	--	181	109	--	103	141	--	2,573	13.3
34.3	--	--	74	--	18	--	--	--	3	95	0.5
34.4	1,005	124	251	86	--	--	21	--	--	483	2.5
34.5	1,284	15	--	--	197	--	41	--	6	1,543	8.0
34.6	--	--	--	--	--	--	--	15	--	15	0.1
34.7	2,133	231	--	10	--	269	--	--	--	2,643	13.7
34.8	2,009	--	--	57	--	--	--	--	12	2,078	10.8
34.9	906	--	32	--	--	--	--	--	34	972	5.0
35.0	8,639	43	--	12	--	--	--	--	--	8,694	45.0
35.1	227	--	--	--	--	--	--	--	--	227	1.2
35.2	--	--	--	--	--	--	--	--	--	0	0.0
Total	17,177	474	357	346	324	269	165	156	55	19,323	
Percent	88.9	2.5	1.8	1.8	1.7	1.4	0.9	0.8	0.3		

[1]Observation Time (minutes).
[2]PW=perched watching, PP=perched preening, PH=perched hunting, PU=perched unknown, DW=drinking water, CL=perched close to mate, ES=eating on shore, PD=perched drying, PR=perched roosting.

APPENDIX F: BOX BAR BREEDING AREA SUMMARY

Table 18. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2006.

Human Activity	None	Watched	Total	Percent
Fishermen	--	2	2	25.0
Small planes	--	2	2	25.0
Campers	--	1	1	12.5
Gunshots	1	--	1	12.5
Hikers	--	1	1	12.5
Picnickers	--	1	1	12.5
Total	1	7	8	

Table 19. Observed prey types delivered to the nest, Box Bar BA, Arizona, 2006.

Sex	Fish	Mammals	Unknown	Total	Percent
Male	6	1	1	8	47.1
Female	7	1	1	9	52.9
Total	13	2	2	17	
Percent	76.5	11.8	11.8		

Table 20. Bald eagle habitat analysis at the Box Bar BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
23.1	SH	Right	No	1	RU	MB
23.2	SS	Left	No	1	RU	UP
23.9	CT	Left	No	1	RI	UP
24.0	SP	Left	No	1	RU	UP
24.1	SP	Left	No	6	RI	MB
24.1	SM	Right	No	1	BW	MB
24.3	SM	Left	No	6	RI	MB
24.4	SH	Left	No	6	RI	CW
24.5	--	Left	Yes	6	RU	CW
24.6	NE	Left	No	7	RI	CW
24.9	--	Left	No	3	RU	CW
25.0	SM	Right	No	1	RI	FL

[1]River kilometers (Hunt et. al. 1992).
[2]SH=hard snag, SS=snag, shrub, CT=cliff top, SP=stump or fallen tree, SM=snag, mesquite, 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]RU=run, RI=riffle, BW=backwater.
[5]MB=mesquite bosque, UP=upland desert, CW=cottonwood grove, FL=farmland.

Table 21. Bald eagle habitat use at the Box Bar BA, Arizona, 2006.

River km	PH[1,2]	ET	PP	CL	PV	Total	Percent
23.1	276	--	--	--	--	276	16.7
23.9	172	--	10	--	--	182	11.0
24.0	115	--	--	--	--	115	7.0
24.1	180	--	--	17	2	199	12.1
24.3	--	--	21	--	--	21	1.3
24.4	--	--	8	--	--	8	0.5
24.5	--	--	--	--	2	2	0.1
24.6	--	662	40	--	1	703	42.7
24.9	97	--	40	--	5	142	8.6
Total	840	662	119	17	10	1648	
Percent	51.0	40.2	7.2	1.0	0.6		

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

APPENDIX G: CRESCENT BREEDING AREA SUMMARY

Table 22. Observed human activity and bald eagle behavior, Crescent BA, Arizona, 2006.

Human Activity	N[1]	W	R	F	Total	Percent
Shore fishermen	90	10	4	3	107	87.7
Boats	9	--	--	--	9	7.4
Float tubers	5	--	--	--	5	4.1
Small planes	--	1	--	--	1	0.8
Total	104	11	4	3	122	

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

Table 23. Observed forage events and success, Crescent BA, Arizona, 2006.

Sex	Fish		Mammals		Birds		Carrion		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	4	4-0	1	1-0	--	--	4	4-0	9	9-0
Female	4	4-0	1	1-0	1	0-1	3	3-0	9	8-1
Total	8	8-0	2	2-0	1	0-1	7	7-0	18	17-1

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

Table 24. Observed prey types delivered to the nest, Crescent BA, Arizona, 2006.

Sex	Fish	Unknown	Total	Percent
Male	3	2	5	62.5
Female	2	1	3	37.5
Total	5	3	8	
Percent	62.5	37.5		

Table 25. Bald eagle habitat analysis at the Crescent BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Shade	Distance to H_2O[3]	Land Type[4]
2.0a	PS	Yes	6	CF
2.0b	SH	No	6	CF
2.1a	PS	Yes	4	CF
2.1b	SH	No	5	CF
2.1c	SH	No	8	CF
2.1d	PS	Yes	4	CF
2.2a	PO	Yes	8	CF
2.2b	SH	No	8	CF
2.3	PO	Yes	8	CF
2.4a	SC	Yes	8	CF
2.4b	SC	No	5	CF
2.5a	SC	No	5	CF
2.5b	SH	No	8	CF
2.6a	SH	No	3	CF
2.6b	PO	Yes	2	CF

[1]Lake kilometers.
[2]PS=pine/conifer, 2nd growth/10-20m, SH=hard snag, PO=pine/conifer, old growth/20-30+m, SC=snag, conifer.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]CF=coniferous forest.

Table 26. Bald eagle habitat use at Crescent BA, Arizona, 2006.								
Lake km	PW[1,2]	PU	PR	PP	ET	PH	Total	Percent
2.0a	90	--	--	--	--	73	163	3.7
2.0b	22	--	--	--	--	--	22	0.5
2.1a	236	--	--	--	--	--	236	5.4
2.1b	691	64	--	--	--	5	760	17.5
2.1c	276	--	--	14	--	--	290	6.7
2.1d	--	--	--	--	25	--	25	0.6
2.2	435	264	--	--	11	--	710	16.3
2.3	197	--	--	--	--	--	197	4.5
2.4a	977	--	247	11	34	--	1,269	29.2
2.4b	181	--	--	--	--	--	181	4.2
2.5a	283	--	--	52	--	--	335	7.7
2.5b	2	--	--	--	2	--	4	0.1
2.6a	112	--	--	--	6	--	118	2.7
2.6b	--	--	--	35	5	--	40	0.9
Total	3,502	328	247	112	83	78	4,350	
Percent	80.5	7.5	5.7	2.6	1.9	1.8		

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

APPENDIX H: LADDERS BREEDING AREA SUMMARY

Table 27. Observed human activity and bald eagle behavior, Ladders BA, 2006.

Human Activity	N[1]	W	F	L	B	Total	Percent
Canoes/kayaks	3	79	--	--	18	100	60.6
Rafters	--	51	--	--	--	51	30.9
Small planes	1	3	--	--	--	4	2.4
Agency worker	--	1	2	1	--	4	2.4
Helicopters	--	3	--	--	--	3	1.8
Rancher	--	2	--	--	--	2	1.2
Ultra-light	--	1	--	--	--	1	0.6
Total	4	140	2	1	18	165	

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

Table 28. Observed forage events and success, Ladders BA, Arizona, 2006.

Sex	Fish		Birds		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	3	1-2	1	0-1	1	0-1	--	--	5	1-4
Female	1	1-0	1	0-1	1	0-1	3	1-2	6	2-4
Total	4	2-2	2	0-2	2	0-2	3	1-2	11	3-8

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

Table 29. Observed prey types delivered to the nest, Ladders BA, Arizona 2006.

Sex	Fish	Mammals	Birds	Reptiles	Unknown	Total	Percent
Male	22	4	2	2	5	35	77.8
Female	8	--	--	--	2	10	22.2
Total	30	4	2	2	7	45	
Percent	66.7	8.9	4.4	4.4	15.6		

Table 30. Observed prey items delivered to the nest, Ladders BA, Arizona, 2006.

Sex	Fish	Mammals	Total	Percent
	CP[1]	RSQ		
Male	6	1	7	70.0
Female	3	--	3	30.0
Total	9	1	10	
Percent	90.0	10.0		

[1]CP=carp, RSQ=rock squirrel.

Table 31. Bald eagle habitat analysis at the Ladders BA, Arizona 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
159.9	JN	Right	No	1	RB	UP
160.0	CT	Left	Yes	3	RB	UP
160.1	SJ	Right	Yes	1	RB	UP
160.3	JN	Right	No	1	PO	UP
160.5	JN	Right	No	1	PO	UP
161.2a	BA	Right	No	1	PO	UP
161.2b	CF	Right	No	2	PO	UP
161.2c	CF	Right	No	1	PO	UP
161.2d	CF	Right	Yes	3	PO	UP
161.2e	CF	Right	Yes	2	PO	UP
161.2f	CF	Right	Yes	1	PO	UP
161.2g	CT	Right	No	1	PO	UP
161.2h	JN	Right	No	1	PO	UP
161.2i	SJ	Right	No	2	PO	UP
161.3a	BA	Right	No	1	PO	UP
161.3b	CF	Right	No	1	PO	UP
161.3c	CF	Right	Yes	1	PO	UP
161.3d	CF	Right	Yes	2	PO	UP
161.3e	CT	Right	No	1	PO	UP
161.3f	JN	Right	No	1	PO	UP
161.4a	BO	Right	Yes	1	RB	UP
161.4b	CF	Right	Yes	1	RB	UP
161.4c	JN	Right	No	2	RB	UP
161.4d	SJ	Right	Yes	2	RB	UP
161.5a	CF	Right	Yes	2	PO	UP
161.5b	JN	Right	No	3	RB	UP
161.5c	JN	Right	No	1	RB	UP
161.5d	PS	Right	Partial	2	RB	UP
161.5e	RW	Center	No	0	RB	UP
161.5f	RW	Right	Yes	0	RB	UP
161.5g	RW	Right	No	0	RB	UP
161.5h	SJ	Right	Yes	2	RB	UP
161.5i	SJ	Right	No	3	RB	UP
161.5j	SO	Right	No	1	RB	UP
161.6a	CF	Right	Yes	3	RB	UP
161.6b	--	Right	No	2	RB	UP
161.6c	JN	Right	Partial	2	RB	UP
161.6d	JN	Right	Yes	2	RB	UP
161.6e	RW	Center	No	0	PO	UP
161.6f	SJ	Right	No	2	RB	UP
161.7a	CF	Right	No	2	RB	UP
161.7b	CF	Right	Yes	2	RB	UP
161.7c	JN	Right	Yes	2	RB	UP
161.7d	JN	Right	No	2	RB	UP
161.7e	JN	Right	Yes	3	RB	UP
161.7f	JN	Right	Partial	3	RB	UP
161.7g	JN	Right	No	3	RB	UP

[1]River kilometer (Hunt et. al. 1992).
[2]JN=juniper, CT=cliff top, SJ=juniper snag, BA=cut bank, CF=cliff ledge, BO=boulder, PS=pine/conifer, 2nd growth/10-20m, RW=rock in water, SO=shore, SC=snag, conifer, ST=snag top, PT=pinnacle top, ID=island.
[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, PO=pool.
[5]UP=desert upland.

Table 31. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
161.7h	JN	Right	Partial	2	RB	UP
161.7i	PS	Right	Yes	3	RB	UP
161.7j	SC	Right	No	3	RB	UP
161.7k	SJ	Right	No	2	RB	UP
161.7l	SJ	Right	Yes	2	RB	UP
161.7m	SJ	Right	No	3	RB	UP
161.7n	SJ	Right	Yes	3	RB	UP
161.7o	SO	Right	No	1	RB	UP
161.7p	SO	Right	Yes	0	RB	UP
161.8a	CT	Right	Yes	2	RB	UP
161.8b	JN	Right	Yes	2	RB	UP
161.8c	JN	Right	No	2	RB	UP
161.8d	JN	Right	Partial	2	RB	UP
161.8e	--	Right	Yes	2	RB	UP
161.8f	--	Right	Partial	2	RB	UP
161.8g	SC	Right	Yes	2	RB	UP
161.8h	SJ	Right	No	2	RB	UP
161.8i	SJ	Right	Yes	3	RB	UP
161.8j	SJ	Right	No	3	RB	UP
161.8k	SJ	Right	Partial	3	RB	UP
161.8l	SJ	Right	Yes	3	RB	UP
161.9a	BO	Right	Yes	1	RB	UP
161.9b	CF	Right	Yes	1	RB	UP
161.9c	CF	Right	No	1	RB	UP
161.9d	CT	Right	Yes	2	RB	UP
161.9e	CT	Right	Yes	1	RB	UP
161.9f	CT	Right	No	1	RB	UP
161.9g	JN	Right	No	2	RB	UP
161.9h	JN	Right	Partial	2	RB	UP
161.9i	JN	Right	Yes	2	RB	UP
161.9j	JN	Right	No	3	RB	UP
161.9k	JN	Right	Yes	1	RB	UP
161.9l	JN	Right	No	1	RB	UP
161.9m	RW	Center	No	0	RB	UP
161.9n	RW	Center	Yes	0	RB	UP
161.9o	RW	Center	No	1	RB	UP
161.9p	RW	Left	Yes	0	RB	UP
161.9q	SJ	Right	No	2	RB	UP
161.9r	SJ	Right	Yes	2	RB	UP
161.9s	SJ	Right	Yes	3	RB	UP
161.9t	SJ	Right	Partial	1	RB	UP
161.9u	SJ	Right	Partial	2	RB	UP
161.9v	SJ	Right	Yes	1	RB	UP
161.9w	SJ	Right	No	1	RB	UP
161.9x	SO	Right	No	0	RB	UP
161.9y	ST	Right	No	2	RB	UP
161.9z	ST	Right	Yes	2	RB	UP

[1]River kilometer (Hunt et. al. 1992).
[2]JN=juniper, CT=cliff top, SJ=juniper snag, BA=cut bank, CF=cliff ledge, BO=boulder, PS=pine/conifer, 2nd growth/10-20m, RW=rock in water, SO=shore, SC=snag, conifer, ST=snag top, PT=pinnacle top, ID=island.
[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, PO=pool.
[5]UP=desert upland.

Table 31. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
161.9aa	ST	Right	Yes	3	RB	UP
162.0a	CF	Right	No	0	RB	UP
162.0b	CF	Right	Partial	1	RB	UP
162.0c	--	Right	No	2	RB	UP
162.0d	CT	Right	No	2	RB	UP
162.0e	CT	Right	No	1	RB	UP
162.0f	JN	Right	No	3	RB	UP
162.0g	JN	Right	Yes	2	RB	UP
162.0h	JN	Right	No	2	RB	UP
162.0i	PT	Right	Partial	1	RB	UP
162.0j	RW	Center	Partial	0	RB	UP
162.0k	SJ	Right	No	2	RB	UP
162.0l	SJ	Right	Yes	2	RB	UP
162.0m	SJ	Right	Partial	2	RB	UP
162.1a	PT	Right	Partial	1	RB	UP
162.1b	RW	Center	No	0	RB	UP
162.1c	SJ	Right	No	2	RB	UP
162.2	JN	Left	Yes	1	RB	UP
162.3a	CT	Right	Yes	1	RB	UP
162.3b	CT	Right	No	1	PO	UP
162.3c	JN	Right	No	2	RB	UP
162.6	RW	Left	No	0	PO	UP
162.7a	CF	Left	Yes	2	RB	UP
162.7b	ID	Left	No	0	PO	UP
162.7c	PT	Left	No	1	PO	UP
162.8a	CF	Left	Yes	2	RB	UP
162.8b	--	Left	No	0	PO	UP
163.4	CF	Right	No	2	RB	UP
163.5a	CF	Right	No	1	PO	UP
163.5b	CT	Right	No	1	RB	UP

[1]River kilometer (Hunt et. al. 1992).
[2]JN=juniper, CT=cliff top, SJ=juniper snag, BA=cut bank, CF=cliff ledge, BO=boulder, PS=pine/conifer, 2nd growth/10-20m, RW=rock in water, SO=shore, SC=snag, conifer, ST=snag top, PT=pinnacle top, ID=island.
[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, PO=pool.
[5]UP=desert upland.

Table 32. Bald eagle habitat use at the Ladders BA, Arizona, 2006.

River km	PH[1,2]	PW	PU	PP	CL	DW	PD	ES	Total	Percent
160.3	20	--	--	--	--	--	--	--	20	0.1
161.2	560	1,001	--	--	--	8	--	--	1,569	9.1
161.3	492	400	112	--	70	--	--	--	1,074	6.2
161.4	63	85	72	16	--	--	--	--	236	1.4
161.5	195	--	136	69	--	34	--	23	457	2.6
161.6	253	--	50	19	--	17	--	--	339	2.0
161.7	939	566	309	262	--	--	34	--	2,110	12.2
161.8	1,614	881	343	154	109	28	--	--	3,129	18.1
161.9	1,606	2,224	889	482	144	65	19	--	5,429	31.4
162.0	1,164	517	68	308	--	--	42	--	2,099	12.1
162.1	--	91	3	6	--	--	--	--	100	0.6
162.2	43	--	--	--	--	--	--	--	43	0.2
162.3	84	--	2	--	--	--	--	--	86	0.5
162.7	4	133	3	--	--	--	--	--	140	0.8
162.8	--	330	--	--	--	--	--	--	330	1.9
163.5	120	--	33	--	--	--	--	--	153	0.9
Total	7,157	6,228	2,020	1,316	323	152	95	23	17,314	
Percent	41.3	36.0	11.7	7.6	1.9	0.9	0.5	0.1		

[1]Observation Time (minutes).
[2]PH=perched hunting, PW=perched watching, PU=perched unknown, PP=perched preening, CL=perched close to mate, DW=drinking water, PD=perched drying, ES=eating on shore.

APPENDIX I: LYNX BREEDING AREA SUMMARY

Table 33. Observed human activity and bald eagle behavior, Lynx BA, Arizona, 2006.				
Human Activity	None	Watched	Total	Percent
Small planes	5	2	7	28.0
Helicopters	--	6	6	24.0
Hikers	4	1	5	20.0
Canoes/kayaks	3	--	3	12.0
Boats	2	--	2	8.0
Fishermen	1	--	1	4.0
Rafters	1	--	1	4.0
Total	16	9	25	

Table 34. Observed forage events and success, Lynx BA, Arizona, 2006.								
Sex	Fish		Birds		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	1	0-1	--	--	--	--	1	0-1
Female	1	1-0	--	--	--	--	1	1-0
Unknown	1	0-1	1	0-1	1	0-1	3	0-3
Total	3	1-2	1	0-1	1	0-1	5	1-4

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

Table 35. Observed prey types delivered to the nest, Lynx BA, Arizona, 2006.							
Sex	Birds	Fish	Mammals	Carrion	Unknown	Total	Percent
Male	3	1	1	1	5	11	31.4
Female	3	4	4	1	8	20	57.1
Unknown	--	--	--	--	4	4	11.4
Total	6	5	5	2	17	35	
Percent	17.1	14.3	14.3	5.7	48.6		

Table 36. Bald eagle habitat analysis at the Lynx BA, Arizona, 2006.				
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]
Nest	PG	Right	Partial	6
Perch 1	PG	Right	No	2
Perch 2	PG	Right	No	7
Perch 3	PG	Right	No	7
Perch 4	PG	Right	No	6
HUA[4]	PS, PG	Right	Partial	1 thru 6
LUA[5]	PS	Left	No	1 thru 4

[1]Identified in ABENWP Lynx Lake Breeding Area Summary Report, 2006.
[2]PG=pine snag, PS=pine/conifer, 2nd growth/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]HUA=heavy habitat use area, multiple perch locations.
[5]LUA=light habitat use area, multiple perch locations.

Table 37. Bald eagle habitat use at the Lynx BA, Arizona, 2006.											
Perch Location	PW[1,2]	PH	PP	PV	PE	CL	PD	SS	NX	Total	Percent
Nest	361	--	12	8	133	--	--	--	834	1,348	14.6
Perch 1	2,678	99	55	8	--	43	6	--	--	2,889	31.2
Perch 2	2,173	12	54	--	--	--	--	--	--	2,239	24.2
Perch 3	500	--	--	--	--	--	--	--	--	500	5.4
Perch 4	127	--	--	--	--	--	--	--	--	127	1.4
HUA[3]	1,351	363	12	81	--	--	33	24	--	1,864	20.2
LUA[4]	22	240	--	1	--	13	6	--	--	282	3.0
Total	7,212	714	133	98	133	56	45	24	834	9,249	
Percent	78.0	7.7	1.4	1.1	1.4	0.6	0.5	0.3	9.0		

[1]Observation Time (minutes).
[2]PW=perched watching, PH=perched hunting, PP=perched preening, PV=perched vocalizing, PE=perched eating, CL=perched close to mate, PD=perched drying, SS=standing on shore, NX=nesting activity.
[3]HUA=heavy habitat use area, multiple perch locations.
[4]LUA=light habitat use area, multiple perch locations.

APPENDIX J: NEEDLE ROCK BREEDING AREA SUMMARY

Table 38. Observed human activity and bald eagle behavior, Needle Rock BA, Arizona, 2006.

Human Activity	N[1]	W	V	F	L	B	Total	Percent
Helicopters	10	3	--	--	1	--	14	30.4
Small planes	4	4	1	--	--	--	9	19.6
Gunshots	4	--	--	--	--	2	6	13.0
Motorized parachutes	--	3	--	--	--	--	3	6.5
Canoes/kayaks	2	--	--	--	--	--	2	4.3
Hikers	--	--	--	1	1	--	2	4.3
Researchers	--	1	--	1	--	--	2	4.3
Ultra-light	2	--	--	--	--	--	2	4.3
Agency workers	--	1	--	--	--	--	1	2.2
Ambulances	1	--	--	--	--	--	1	2.2
Campers	1	--	--	--	--	--	1	2.2
Fishermen	1	--	--	--	--	--	1	2.2
OHVs	1	--	--	--	--	--	1	2.2
Shooters	--	1	--	--	--	--	1	2.2
Total	26	13	1	2	2	2	46	

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

Table 39. Observed forage events and success, Needle Rock BA, Arizona, 2006.

Sex	Fish		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	1	1-0	--	--	--	--	1	1-0
Female	4	2-2	3	3-0	--	--	7	5-2
Unknown	1	1-0	--	--	2	2-0	3	3-0
Total	6	4-2	3	3-0	2	2-0	11	9-2

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

Table 40. Observed prey types delivered to the nest, Needle Rock BA, Arizona, 2006.

Sex	Fish	Mammals	Unknown	Total	Percent
Male	1	2	--	3	16.7
Female	7	4	--	11	61.1
Unknown	1	--	3	4	22.2
Total	9	6	3	18	
Percent	50.0	33.3	16.7		

Table 41. Bald eagle habitat analysis at the Needle Rock BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
25.3	MS	Left	No	1	RU	MB
25.5	CL	Left	Yes	2	RU	MB
25.6	MS	Left	No	1	RU	MB
25.7	SM	Left	No	3	RU	MB
25.8a	WO	Right	No	2	RU	WT
25.8b	MS	Left	No	1	RU	MB
25.9	NE	Left	Partial	3	RU	MB
26.0	WO	Left	No	1	RU	WT
26.1	CL	Left	Yes	1	RU	MB
26.2	WO	Left	No	1	RU	WT
26.3	WO	Left	No	1	RU	MB
26.4	RI	Left	Yes	8	--	UP
26.5a	WO	Left	Partial	1	RI	WT
26.5b	ST	Left	No	5	RU	MB
26.6	SM	Left	No	6	RU	UP
27.0	WO	Left	No	1	RB	WT
27.2	WO	Left	Partial	1	RU	WT
27.2	WO	Right	Partial	1	RB	WT
28.4	SG	Left	No	1	RU	MB
28.5	WO	Left	Yes	1	RU	WT
28.6	WO	Left	Partial	2	RI	MB
28.7	CL	Left	Yes	3	RU	MB
28.8	SM	Right	No	1	BW	MB
29.0	WO	Left	Partial	1	RU	WT
29.1	SH	Left	No	1	RU	MB
29.5	RI	Center	No	1	RU	MB

[1]River kilometer (Hunt et. al. 1992).
[2]MS=mesquite, CL=cottonwood large/20-30+m, SM=snag, mesquite, WO=willow, NE=nest, RI=ridge, ST=snag top, SG=snag soft, SH=snag hard.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run, RI=riffle, RB=river bend, BW=backwater.
[5]MB=mesquite bosque, WT=willow thicket, UP=desert upland.

Table 42. Bald eagle habitat use at the Needle Rock BA, Arizona, 2006.							
River km	PW[1,2]	PH	PP	PR	ES	Total	Percent
25.3	248	16	43	--	--	307	3.2
25.5	1,058	74	28	--	--	1,160	11.9
25.6	46	68	79	--	--	193	2.0
25.7	729	--	6	--	--	735	7.6
25.8	386	45	33	--	--	464	4.8
26.0	27	136	--	--	--	163	1.7
26.1	3,202	170	22	44	--	3,438	35.4
26.2	29	--	--	--	--	29	0.3
26.3	16	--	--	--	--	16	0.2
26.4	77	--	--	--	--	77	0.8
26.5	275	--	--	--	--	275	2.8
26.6	38	--	--	--	--	38	0.4
27.0	--	10	--	--	--	10	0.1
27.2	231	--	--	--	--	231	2.4
28.4	463	800	12	--	--	1,275	13.1
28.5	216	218	--	--	20	454	4.7
28.6	10	6	--	--	--	16	0.2
28.7	158	467	14	--	--	639	6.6
29.0	68	--	10	--	--	78	0.8
29.1	72	1	--	--	--	73	0.8
29.5	40	--	--	--	--	40	0.4
Total	7,389	2,011	247	44	20	9,711	
Percent	76.1	20.7	2.5	0.5	0.2		

[1]Observation Time (minutes).
[2]PW=perched watching, PH=perched hunting, PP=perched preening, PR=perched roosting, ES=eating on shore.

APPENDIX K: ORME BREEDING AREA SUMMARY

Table 43. Observed human activity and bald eagle behavior, Orme BA, Arizona 2006.

Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Helicopters	6	74	7	9	1	--	12	109	48.4
Apache helicopters	3	20	2	--	--	--	1	26	11.6
Drivers	1	12	1	1	--	1	2	18	8.0
Agency workers	--	14	1	2	--	1	--	18	8.0
Rafters	10	--	--	--	--	--	--	10	4.4
Small planes	2	5	--	--	--	--	--	7	3.1
Hikers	--	--	1	4	--	--	2	7	3.1
Ranchers	3	3	--	--	--	--	1	7	3.1
Tubers	--	5	--	1	--	--	--	6	2.7
Motorized parachutes	1	3	--	1	--	--	--	5	2.2
Researchers	--	1	--	1	--	--	1	3	1.3
Fishermen	--	1	--	1	--	--	--	2	0.9
Bikers	--	--	--	1	--	--	--	1	0.4
Canoes/kayaks	1	--	--	--	--	--	--	1	0.4
Photographers	--	1	--	--	--	--	--	1	0.4
Birders	--	--	--	1	--	--	--	1	0.4
Navy planes	1	--	--	--	--	--	--	1	0.4
Gunshots	1	--	--	--	--	--	--	1	0.4
Swimmers	--	1	--	--	--	--	--	1	0.4
Total	29	140	12	22	1	2	19	225	

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

Table 44. Observed forage event and success, Orme BA, Arizona, 2006.

Sex	Fish		Birds		Reptiles		Amphibians		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U	E	S-U
Male	10	9-1	9	1-8	1	1-0	1	1-0	5	4-1	26	16-10
Female	18	13-5	4	1-3	--	--	--	--	4	1-3	26	15-11
Total	28	22-6	13	2-11	1	1-0	1	1-0	9	5-4	52	31-22

[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, 2006.

Sex	Fish	Birds	Herps	Unknown	Total	Percent
Male	16	1	2	11	30	53.6
Female	19	1	1	5	26	46.4
Total	35	2	3	16	56	
Percent	62.5	3.6	5.4	28.6		

Table 46. Observed prey items delivered to the nest, Orme BA, Arizona, 2006.

Sex	Fish		Birds	Total	Percent
	Suckers	Carp	American wigeon		
Male	1	--	--	1	12.5
Female	5	1	1	7	87.5
Total	6	1	1	8	
Percent	75.0	12.5	12.5		

Table 47. Bald eagle habitat analysis at the Orme BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
0.3v[6]	SH	Right	No	5	RU	CW
0.4v	CL	Right	No	5	RU	CW
0.4v	SH	Right	No	5	RU	CW
0.4v	SM	Left	No	1	RU	MB
0.4v	MS	Left	Partial	1	BW	MB
0.4v	SO	Island	No	1	RU	CW
0.5v	SM	Left	No	1	RU	MB
0.5v	SB	Left	No	1	RU	MB
0.6v	CM	Right	No	1	RU	CW
0.6v	SS	Channel	No	1	RU	CW
0.6v	SH	Left	No	1	RI	MB
0.7v	SB	Left	No	1	RU	CW
0.7v	SM	Left	No	1	RU	MB
1.0v	--	Right	No	1	RU	CW
1.0v	BO	Right	No	1	RU	CW
1.0v	MS	Left	Yes	1	RU	MB
1.1v	BO	Right	No	1	RU	CW
1.1v	CM	Right	No	1	RU	CW
1.3v	SM	Left	No	1	RU	MB
1.6v	SH	Left	No	1	RU	CW
4.1s	CM	Right	No	1	RU	CW
4.6s	CM	Left	No	2	RU	CW
4.7s	ST	Left	No	3	RU	CW
4.7s	ST	Left	No	1	RU	CW
4.7s	SH	Left	Yes	2	RU	CW
4.8s	SH	Left	No	1	RU	CW
4.9s	SH	Left	No	3	RU	CW
4.9s	RW	Channel	No	1	RU	CW
4.9s	SG	Left	No	1	RU	CW
4.9s	SH	Left	No	1	RU	CW
5.0s	SH	Left	No	1	RU	CW
5.0s	CL	Right	Partial	3	RU	CW
5.0s	CS	Right	No	2	RU	CW
5.1s	CM	Right	Yes	2	RU	CW
5.1s	SH	Right	No	3	RU	CW
5.2s	SH	Right	No	5	RU	CW
6.1s	BO	Left	No	1	RU	UP
6.2s	CL	Right	Yes	2	RU	CW
7.9s	SG	Left	No	2	RU	CW
9.5s	CL	--	--	--	--	CW
9.9s	CL	Left	No	2	RU	CW
10.4s	SH	Left	No	2	RU	CW
10.6s	SG	Left	No	1	RU	CW
15.3s	CL	--	No	--	--	CW

[1]River kilometer (Hunt et. al. 1992).
[2]SH=hard snag, CL=cottonwood large/20-30+m, SM=mesquite snag, MS=mesquite, SO=shore, SB=sand bar, CM=cottonwood medium/10-20m, SS=snag shrub, BO=boulder, ST=snag top, RW=rock on water, SG=soft snag, CS=cottonwood small/ 0-10m.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run, BW=backwater, RI=riffle.
[5]CW=cottonwood grove, MB=mesquite bosque, UP=desert upland.
[6]v=Verde River, s=Salt River.

Table 48. Bald eagle habitat use at the Orme BA, Arizona, 2006.

River km	PH[1, 2]	PP	PD	SH	PK	ET	DW	ES	WB	PV	Total	Percent
0.3v	86	2	12	1	7	--	--	--	--	--	108	0.4
0.4v	13,793	2,309	193	11	21	31	26	2	49	40	16,475	65.7
0.5v	737	30	3	27	--	--	6	5	--	--	808	3.2
0.6v	2,015	18	62	12	15	--	11	8	--	1	2,142	8.5
0.7v	4	--	--	--	3	--	2	22	--	--	31	0.1
0.8v	381	7	--	27	26	3	1	--	--	--	445	1.8
0.9v	193	13	--	--	--	--	10	9	--	--	225	0.9
1.0v	1,329	42	49	6	--	31	3	10	--	1	1,471	5.9
1.1v	166	--	--	8	--	--	1	--	--	--	175	0.7
1.2v	--	--	--	1	13	--	--	--	--	--	14	0.1
1.3v	33	--	--	--	--	--	--	--	--	--	33	0.1
1.5v	36	--	--	--	--	10	--	--	--	--	46	0.2
1.6v	87	--	--	--	--	--	4	11	4	--	106	0.4
1.8v	241	--	--	--	--	--	--	--	--	--	241	1.0
2.0v	1	--	--	--	--	--	--	--	--	--	1	0.0
4.1s	5	--	--	6	--	--	--	--	--	--	11	0.0
4.6s	13	--	--	--	--	--	--	--	--	--	13	0.1
4.7s	189	--	--	--	--	--	--	--	--	--	189	0.8
4.8s	172	--	--	--	--	--	--	--	--	--	172	0.7
4.9s	661	--	17	--	--	--	3	--	--	--	681	2.7
5.0s	286	--	--	--	--	--	--	--	--	--	286	1.1
5.1s	747	3	--	--	--	--	1	--	--	5	756	3.0
5.2s	99	23	--	--	--	--	--	--	--	--	122	0.5
5.9s	19	--	--	--	--	--	--	--	--	--	19	0.1
6.1s	2	--	--	--	--	--	--	--	--	--	2	0.0
6.2s	36	5	--	--	--	9	--	--	--	--	50	0.2
6.8s	18	--	--	--	--	--	--	--	--	1	19	0.1
7.9s	2	--	--	--	--	--	--	--	--	--	2	0.0
9.5s	15	--	--	--	--	--	--	--	--	--	15	0.1
9.9s	2	--	--	--	--	--	--	--	--	--	2	0.0
10.2s	51	--	--	--	--	--	--	--	--	--	51	0.2
10.4s	238	--	--	--	--	--	--	--	--	--	238	0.9
10.6s	45	--	--	--	--	--	--	--	--	--	45	0.2
15.3s	94	--	--	--	--	--	--	--	--	--	94	0.4
20.Xs	6	--	--	--	--	--	--	--	--	--	6	0.0
Total	21,802	2,452	336	99	85	84	68	67	53	48	25,094	
Percent	86.9	9.8	1.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2		

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

APPENDIX L: PINTO BREEDING AREA SUMMARY

Table 49. Observed human activity and bald eagle behavior, Pinto BA, Arizona, 2006.				
Human Activity	None	Watched	Total	Percent
Fishermen	41	--	41	66.1
Boats	9	1	10	16.1
Gunshots	3	--	3	4.8
Campers	2	--	2	3.2
Helicopters	2	--	2	3.2
Agency Workers	2	--	2	3.2
Canoes/Kayaks	1	--	1	1.6
Jet Skis	1	--	1	1.6
Total	61	1	62	

Table 50. Observed forage events and success, Pinto BA, Arizona, 2006.				
Sex	Fish		Total	
	E[1]	S-U[2]	E	S-U
Male	2	2-0	2	2-0
Female	2	2-0	2	2-0
Unknown	2	1-1	2	1-1
Total	6	5-1	6	5-1

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

Table 51. Observed prey types delivered to the nest, Pinto BA, Arizona, 2006.					
Sex	Fish	Birds	Unknown	Total	Percent
Male	10	1	12	23	60.5
Female	8	--	7	15	39.5
Total	18	1	19	38	
Percent	47.3	2.6	50.0		

Table 52. Bald eagle habitat analysis at the Pinto BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
100.X	CL	Left	Yes	1	RC	TX
101.Xa	CM	Left	No	1	RC	TX
101.Xb	CL	Left	No	1	RC	TX
101.Xc	SH	Left	No	1	RC	TX
102.X	CL	Left	No	1	RC	TX
102.3a	NE	Left	No	3	RU	TX
102.3b	CM	Left	No	3	RU	TX
102.5	SP	Island	No	1	RU	CL
103.1	CF	Right	No	1	RU	CL
103.2	BO	Right	No	1	RU	CL
103.7	SB	Island	No	1	RB	TX
104.0	CL	Right	No	3	RU	CW
104.1a	CM	Right	No	1	BW	TX
104.1b	CM	Right	No	2	BW	TX
104.1c	SB	Island	No	1	RU	TX
104.1d	CS	Right	No	2	BW	TX
104.2a	CM	Right	No	1	BW	TX
104.2b	CM	Right	No	3	RU	CW
104.2c	CL	Right	No	1	BW	TX
104.2d	SO	Right	No	1	RU	TX
104.2e	LG	Island	No	1	RU	TX
104.3a	CM	Right	No	1	BW	TX
104.3b	CL	Right	No	2	BW	TX
104.3c	CS	Right	No	1	BW	TX
104.3d	SO	Right	No	1	RU	TX
104.4a	CM	Right	No	1	BW	TX
104.4b	SO	Right	No	1	BW	TX
104.5	SO	Right	No	1	PO	TX
104.6a	CM	Right	No	1	BW	TX
104.6b	CM	Right	No	2	BW	TX
104.6c	SO	Right	No	1	RU	TX
104.6d	SO	Left	No	1	RU	TX
104.7a	SO	Right	No	1	RU	TX
104.7b	SO	Left	No	1	RU	TX
104.7c	SB	Island	No	1	RU	TX
104.8	SB	Island	No	1	RU	TX
104.9a	SO	Left	No	1	RU	TX
104.9b	SB	Island	No	1	RU	TX
105.0a	CM	Right	No	1	BW	TX
105.0b	SO	Right	No	1	BW	TX
105.2	SO	Right	No	1	RU	TX
106.5	SG	Left	No	1	RU	TX

[1]River kilometer (Hunt et. al. 1992).
[2]CL=cottonwood large/20-30+m, CM=cottonwood medium/10-20m, SH=hard snag, NE=nest, SP=stump or fallen tree, CF=cliff ledge, BO=boulder, SB=sand bar, CS=cottonwood small/0-10m, SO=shore, LG=log, 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]RC=reservoir cove, RU=run, RB=river bend, BW=backwater, PO=pool.
[5]TX=tamarisk thicket, CL=cliffs, CW=cottonwood grove.

Table 53. Bald eagle habitat use at the Pinto BA, Arizona, 2006.

River km	PW[1,2]	CL	PP	NS	PV	PU	ET	PH	EN	Total	Percent
100.X	20	--	--	--	--	77	--	56	--	153	0.7
101.Xa	91	--	5	--	--	--	--	--	--	96	0.4
102.X	1,252	6	18	--	--	--	--	--	--	1,276	5.9
102.3a	--	--	--	342	--	--	--	--	13	355	1.6
102.3b	327	32	11	--	--	--	--	--	--	370	1.7
103.2	11	--	--	--	--	--	--	--	--	11	0.1
104.1a	27	--	50	--	--	--	--	--	--	77	0.4
104.1b	26	--	--	--	--	--	--	--	--	26	0.1
104.1d	19	--	8	--	--	--	--	--	--	27	0.1
104.2a	24	36	--	--	--	--	--	--	--	60	0.3
104.3a	8,165	1770	795	--	70	--	54	--	--	10,854	50.0
104.3c	4	--	--	--	--	--	10	--	--	14	0.1
104.4a	3,584	20	141	--	12	--	--	--	--	3,757	17.3
104.6a	4,303	203	106	--	7	--	7	--	--	4,626	21.3
Total	17,853	2,067	1,134	342	89	77	71	56	13	21,702	
Percent	82.3	9.5	5.2	1.6	0.4	0.4	0.3	0.3	0.1		

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

APPENDIX M: PLEASANT BREEDING AREA SUMMARY

Table 54. Observed human activity and bald eagle behavior, Pleasant BA, Arizona, 2006.

Human Activity	N[1]	W	F	B	Total	Percent
Boats	157	5	1	232	395	79.0
Small Planes	10	7	--	47	64	12.8
Jet Skis	6	--	--	11	17	3.4
Helicopters	3	3	--	4	10	2.0
Military Jets	2	1	--	4	7	1.4
Water Skiers	2	--	--	3	5	1.0
Ultra-lights	--	--	--	2	2	0.4
Total	180	16	1	303	500	

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

Table 55. Watercraft compliance at the southern closure boundary, Pleasant BA, Arizona, 2006.

Date	Boats at Closure	Boats in Closure	Jet Skis at Closure	Jet Skis in Closure	Total
2/10-2/19	14	6	--	--	20
2/24-3/5	252	9	16	1	278
3/10-3/19	106	8	--	--	114
Total	272	23	16	1	412
Percent	90.2%	5.6%	3.9%	.3%	

Table 56. Watercraft compliance: weekend vs. weekday, Pleasant BA, Arizona, 2006.

Date	Boats at Closure	Boats in Closure	Jet Skis at Closure	Jet Skis in Closure	Total	Percent
Weekend	261	13	16	1	291	70.6%
Weekday	111	10	--	--	121	39.4%
Total	372	23	16	1	412	

Table 57. Observed forage events and success, Pleasant BA, Arizona, 2006.

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

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

Table 58. Bald eagle habitat analysis at the Pleasant BA, Arizona, 2006.				
Perch Location[1]	Perch Type[2]	Side	Distance to H_2O[3]	H_2O Type[4]
68.8a	SO	Left	1	RC
68.8b	CT	Left	1	RC
68.9a	ST	Left	1	RC
68.9b	CT	Left	1	RC
68.9c	CF	Left	1	RC
69.0a	NE	Left	1	RC
69.0b	CF	Left	1	RC
69.0c	CT	Left	1	RC
69.1a	CF	Left	1	RC
69.1b	CT	Left	1	RC
69.2	CF	Left	1	RC
69.3	SO	Left	1	RC
69.4	SO	Left	1	RC

[1]River kilometer (Hunt et. al. 1992).
[2]SO=shore, CT=cliff top, ST=snag top, CF=cliff ledge, 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.

Table 59. Bald eagle habitat use at the Pleasant BA, Arizona, 2006.												
River km	PW[1,2]	CL	PH	PP	EC	CO	DW	BA	SS	PV	Total	Percent
68.8	871	428	25	67	--	12	1	--	10	2	1,416	28.2
68.9	1,892	206	190	152	4	3	--	--	--	--	2,447	48.8
69.0	40	4	22	--	8	--	--	--	--	--	74	1.5
69.1	849	27	55	20	28	3	--	--	--	3	985	19.6
69.2	53	--	--	--	--	--	--	--	--	--	53	1.1
69.3	--	--	--	--	--	--	9	--	--	--	9	0.2
69.4	13	--	--	--	--	--	4	13	--	--	30	0.6
Total	3,718	665	292	239	40	18	14	13	10	5	5,014	
Percent	74.2	13.3	5.8	4.8	0.8	0.4	0.3	0.3	0.2	0.1		

[1]Observation Time (minutes).
[2]PW=perched watching, CL=perched close to mate, PH=perched hunting, PP=perched preening, EC=eating on cliff, CO=copulating, DW=drinking water, BA=bathing, SS=standing on shore, PV=perched vocalizing.

APPENDIX N: SAN CARLOS BREEDING AREA SUMMARY

Table 60. Observed human activity and bald eagle behavior, San Carlos BA, Arizona, 2006.

Human Activity	N[1]	W	R	F	L	U	Total	Percent
Driver	44	9	--	--	1	--	54	36.2
Hiker	26	3	--	--	1	--	30	20.1
Horseback rider	12	1	--	--	--	1	14	9.4
Train	6	2	--	--	--	--	8	5.4
Power company	6	1	--	--	--	--	7	4.7
OHV	5	--	1	--	--	--	6	4.0
Agency worker	6	--	--	--	--	--	6	4.0
Gunshot	3	1	1	--	--	--	5	3.4
Jet	4	--	--	--	--	--	4	2.7
Helicopter	3	--	--	--	--	1	4	2.7
Researcher	1	--	--	2	--	--	3	2.0
Woodcutter	2	--	--	1	--	--	3	2.0
Bicycler	3	--	--	--	--	--	3	2.0
Small plane	2	--	--	--	--	--	2	1.3
Total	123	17	2	3	2	2	149	

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

Table 61. Observed forage events and success, San Carlos BA, Arizona, 2006.

Sex	Fish		Birds		Reptiles		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	1	1-0	1	0-1	1	1-0	3	2-1
Total	1	1-0	1	0-1	1	1-0	3	2-1

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

Table 62. Observed prey types delivered to the nest, San Carlos BA, Arizona, 2006.

Sex	Fish	Mammals	Reptiles	Birds	Unknown	Total	Percent
Male	16	3	2	1	26	48	71.6
Female	8	2	--	--	9	19	28.4
Total	24	5	2	1	35	67	
Percent	35.8	7.5	3.0	1.5	52.2		

Table 63. Observed prey items delivered to the nest, San Carlos BA, Arizona, 2006.

Sex	Fish					Birds	Mammals	Reptiles	Total	Percent
	CC[1]	SU	BC	CP	GF	AC	WC	GT		
Male	2	2	1	--	--	1	1	1	8	61.5
Female	3	--	--	1	1	--	--	--	5	38.5
Total	5	2	1	1	1	1	1	1	13	
Percent	38.5	15.4	7.7	7.7	7.7	7.7	7.7	7.7		

[1]CC=channel catfish, SU=sucker, BC=black crappie, CP=carp, GF=goldfish, AC=American coot, WC=western cottontail, GT=garter snake.

Table 64. Bald eagle habitat analysis at the San Carlos BA, Arizona, 2006.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
10.8	TP	Right	No	8	PN	FL
11.0a	CM	Right	Yes	1	RU	CW
11.0b	SH	Right	No	2	RU	CW
11.0c	CM	Right	Partial	1	RU	CW
11.0d	CL	Right	Yes	1	RU	CW
11.1	NE	Right	Partial	1	RU	CW
11.2	CL	Right	Partial	5	RU	CW

[1]River kilometer (Hunt et. al. 1992).
[2]TP=telephone pole, CM=cottonwood medium/10-20m, SH=hard snag, CL=cottonwood large/20-30+m, NE=nest tree.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]PN=pond, RU=run
[5]FL=farm land, CW=cottonwood grove.

Table 65. Bald eagle habitat use at the San Carlos BA, Arizona, 2006.									
River km	PW[1,2]	PP	CL	PR	PH	PV	PX	Total	Percent
10.8	--	--	--	--	17	--	--	17	0.3
11.0a	2,251	253	--	59	18	1	--	2,582	40.8
11.0b	40	--	--	--	--	--	1	41	0.6
11.0c	26	27	--	--	--	--	--	53	0.8
11.0d	5	2	--	--	--	--	--	7	0.1
11.1	3,081	151	273	9	--	5	--	3,519	55.7
11.2	91	8	--	--	--	3	1	103	1.6
Total	5,494	441	273	68	35	9	2	6,322	
Percent	86.9	7.0	4.3	1.1	0.6	0.1	<0.1		

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

APPENDIX O: SUICIDE BREEDING AREA SUMMARY

Table 66. Observed human activity and bald eagle behavior, Suicide BA, Arizona, 2006.

Human Activity	N[1]	W	R	F	B	U	Total	Percent
Vehicles	1,596	1,029	--	--	92	--	2,717	68.5
Boats	166	729	--	--	53	--	948	23.9
Jet Skis	--	82	--	--	7	--	89	2.2
Pedestrians	17	32	--	--	1	--	50	1.3
Military Jets	37	5	--	--	3	--	45	1.1
Small Planes	27	9	--	--	2	--	38	1.0
Fisherman	12	25	--	--	--	--	37	0.9
Agency Workers	9	3	3	--	--	--	15	0.4
Helicopters	3	5	--	--	2	2	12	0.3
Gunshots	8	1	--	1	1	--	11	0.3
Military Planes	--	4	--	--	--	1	5	0.1
Total	1,875	1,924	3	1	161	3	3,967	

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

Table 67. Observed forage events and success, Suicide BA, Arizona, 2006.

Sex	Fish		Mammals		Carrion		Birds		Reptiles		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U	E	S-U
Unknown	70	63-7	15	12-3	6	6-0	1	1-0	1	1-0	93	83-10
Total	70	63-7	15	12-3	6	6-0	1	1-0	1	1-0	93	83-10

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

Table 68. Observed prey types delivered to the nest, Suicide BA, Arizona, 2006.

Sex	Fish	Mammals	Carrion	Birds	Reptiles	Total	Percent
Male	30	9	4	--	1	44	53.0
Female	33	3	2	1	--	39	47.0
Total	63	12	6	1	1	83	
Percent	75.9	14.5	7.2	1.2	1.2		

Table 69. Observed prey items delivered to the nest, Suicide BA, Arizona, 2006.

Sex	Fish				Total	Percent
	BC[1]	LB	CP	CC		
Male	12	11	4	3	30	47.6
Female	13	14	6	--	33	52.4
Total	25	25	10	3	63	
Percent	39.7	39.7	15.9	4.8		

[1]BC=black crappie, LB=largemouth bass, CP=carp, CC=channel catfish.

Table 70. Bald eagle habitat analysis at the Suicide BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]
0.3	CF	Left	No	4
0.4	CF	Left	No	5
0.4	CF	Left	No	6
0.5	BO	Left	Partial	3
0.5	PT	Left	Partial	7
0.5	CT	Left	No	7
0.5	CF	Left	Partial	7
0.5	CT	Left	No	8
0.5	BO	Left	No	6
0.5	AG	Left	Partial	5
0.5	CF	Left	No	6
0.6	CF	Left	Partial	6
0.6	CF	Left	Partial	7
0.6	SG	Left	Partial	6
0.6	PT	Left	Partial	6
0.6	PT	Left	Partial	6
0.6	SH	Left	Partial	5
0.6	CT	Left	No	8
0.6	AG	Left	Partial	6
0.6	SH	Left	Partial	6
0.6	CF	Left	Partial	3
0.6	AG	Left	Partial	6
0.6	CF	Left	Partial	6
0.6	SG	Left	Partial	6
0.6	CT	Left	No	7
0.6	CF	Left	Partial	6
0.6	PF	Left	No	4
0.6	SO	Left	No	1
0.6	PF	Left	No	5
0.7	PT	Left	No	5
0.7	CT	Left	No	6
0.7	CT	Left	No	6
0.7	CT	Left	No	6
0.7	CF	Left	No	5
0.7	CT	Left	No	6
0.7	PF	Left	Partial	4
0.7	CT	Left	No	6
0.8	BO	Left	No	5
0.8	PT	Left	No	5
0.8	CF	Left	Partial	4
0.9	CT	Left	No	4
0.9	BO	Left	No	3
1	CF	Left	No	4
1	PF	Left	No	2
1.3	SO	Left	No	1
1.3	SO	Left	No	1
1.4	SO	Left	No	1
2	SG	Right	No	2
32.2	SO	R	N	1

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff face, BO=boulder, PT=pinnacle top, CT=cliff top, AG=agave, SG=soft snag, SH=hard snag, PF=pinnacle ledge, 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.

Table 71. Bald eagle habitat use at the Suicide BA, Arizona, 2006.										
Lake km	PW[1,2]	CL	PR	PP	PV	EC	PH	PK	Total	Percent
0.4-0.5	20	--	--	--	--	--	--	--	20	0.1
0.5-0.6	4,811	547	-	394	301	47	--	17	6,117	39.0
0.6-0.7	2,234	635	1,514	339	3	77	--	31	4,833	30.8
0.7-0.8	3,607	423	--	480	9	3	--	22	4,544	29.0
0.8-0.9	9	--	--	2	1	--	--	7	19	0.1
1.0-1.1		--	--	--	--	--	31	--	31	0.2
1.1-1.2	14	--	--	4	1	--	47	--	66	0.4
2-2.1	12	--	--	--	--	--	18	--	30	0.2
32.2	--	--	--	--	--	--	--	13	13	0.1
Total	10,707	1,605	1,514	1,219	315	127	96	95	15,678	
Percent	68.3	10.2	9.7	7.8	2.0	0.8	0.6	0.6		

[1]Observation Time (minutes).
[2]PW=perched watching, CL=perched close to mate, PR=perched roosting, PP=perched preening, PV=perched vocalizing, EC=eating on cliff, PH=perched hunting, PK=perched with prey.

APPENDIX P: TONTO BREEDING AREA SUMMARY

Table 72. Observed human activity and bald eagle behavior, Tonto BA, Arizona, 2006.

Human Activity	N[1]	W	R	F	X	Total	Percent
Boat	24	2	1	--	1	28	43.8
Helicopter	5	1	--	1	--	7	10.9
Motorized Parachute	--	1	--	--	6	7	10.9
Canoes/Kayaks	4	1	--	--	--	5	7.8
Small Planes	4	--	--	--	--	4	6.3
Hikers	2	--	--	--	--	2	3.1
Researchers	2	--	--	--	--	2	3.1
Agency Workers	2	--	--	--	--	2	3.1
Jets	1	1	--	--	--	2	3.1
Drivers	1	--	--	--	--	1	1.6
Fishermen	1	--	--	--	--	1	1.6
Horseback Riders	1	--	--	--	--	1	1.6
Sonic Booms	1	--	--	--	--	1	1.6
Jet Skis	--	1	--	--	--	1	1.6
Total	48	7	1	1	7	64	

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

Table 73. Observed forage events and success, Tonto BA, Arizona, 2006.

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	14-2	2	0-2	2	2-0	2	1-1	22	17-5
Female	3	3-0	2	1-1	--	--	--	--	5	4-1
Both	3	2-1	--	--	--	--	--	--	3	2-1
Total	22	19-3	4	1-3	2	2-0	2	1-1	30	23-7

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

Table 74. Observed prey typed delivered to the nest, Tonto BA, Arizona, 2006.

Sex	Fish	Birds	Mammals	Unknown	Total	Percent
Male	59	4	3	2	68	66.7
Female	24	2	1	7	34	33.3
Total	83	6	4	9	102	
Percent	81.4	5.9	3.9	8.8		

Table 75. Observed prey items delivered to the nest, Tonto BA, Arizona, 2006.

Sex	Fish						Birds		Total	Percent
	BC[1]	CP	LB	CC	SB	SP	AC	GB		
Male	14	7	8	2	2	1	3	1	38	82.6
Female	1	4	2	--	--	--	1	--	8	17.4
Total	15	11	10	2	2	1	4	1	46	
Percent	32.6	23.9	21.7	4.3	4.3	2.2	8.7	2.2		

[1]BC=black crappie, CP=carp, LB=largemouth bass, CC=channel catfish, SB=smallmouth bass, SP=small panfish, AC=American coot, GB=great blue heron.

Table 76. Bald eagle habitat analysis at the Tonto BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
9.5	RI	Left	No	6	RC	UP
10.5	PT	Left	No	4	RC	UP
13.8	CT	Right	Yes	5	--	UP
15.2a	LG	Right	No	1	IF	WT
15.2b	SG	Right	No	1	IF	WT
15.3	SG	Right	Partial	1	IF	WT
15.4	LG	Right	No	1	IF	WT
15.7	SH	Right	No	1	IF	TX
15.8	SG	Right	Partial	1-4	IF	TX
15.9	SG	Right	No	3-4	IF	CW
16.0	SG	Right	No	1	IF	CW
16.1a	SH	Right	Partial	1-2	IF	TX
16.1b	SO	Right	No	1	IF	TX
16.2	BA	Left	Yes	1	IF	UP
16.3	SG	Right	Partial	1	IF	TX
16.4a	SO or LG	Center	No	1	IF	TX
16.4b	SH	Right	No	2	IF	TX
16.5a	LG	Left	No	1	BW	TX
16.5b	SH	Right	Partial	5	IF	TX
16.5c	--	Right	Yes	1	IF	TX
16.5d	SO	Left	No	1	BW	TX
16.6	SO	Right	No	1	IF	TX
16.7a	SG	Left	Partial	5-6	IF	CW
16.7b	CM	Left	No	5-6	IF	CW
16.7c	SO	Center	No	1	IF	TX
16.7d	SG	Right	No	4	IF	WT
16.8a	SG	Left	Partial	1	PW	CW
16.8b	SO	Right	No	1	IF	TX
16.9	CM	Left	Yes	1	PW	CW
17.0	MS	Left	No	6	IF	MB
17.1	SG	Left	Partial	1	PW	CW
17.9	SH	Left	No	3	PO	TX
19.0	SH	Right	No	1	IF	TX

[1]River kilometer (Hunt et. al. 1992).
[2]RI=ridge, PT=pinnacle top, CT=cliff top, LG=log, SG=soft snag, SH=hard snag, SO=shore, BA=cut bank, CM=m, CM=cottonwood medium/10-20m, MS=mesquite.
[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, IF=inflow to reservoir, BW=backwater, PW=pocket water, PO=pool.
[5]UP=desert upland, WT=willow thicket, TX=tamarisk thicket, CW=cottonwood grove, MB=mesquite bosque.

Table 77. Bald eagle habitat use at the Tonto BA, Arizona, 2006.

River km	PR[1,2]	PW	CL	PP	DW	SS	SH	PU	ET	PH	Total	Percent
10.5	--	24	--	--	--	--	--	26	--	--	50	0.6
13.8	--	59	--	--	--	--	--	17	--	--	76	0.9
15.2	--	--	--	--	--	--	--	3	--	18	21	0.2
15.8	--	97	--	47	--	--	--	--	9	--	153	1.8
15.9	--	--	--	15	--	--	--	--	--	--	15	0.2
16	--	14	--	0	--	--	--	--	--	--	14	0.2
16.1	12	96	--	4	--	1	--	1	--	2	116	1.4
16.2	17	83	--	--	--	--	--	--	--	--	100	1.2
16.3	--	32	--	9	--	--	--	--	6	--	47	0.5
16.4	--	6	--	40	4	2	--	1	5	--	58	0.7
16.5	89	68	6	25	76	2	--	--	2	--	268	3.1
16.6	--	12	--	--	9	5	--	--	2	--	28	0.3
16.7	1,562	227	--	378	391	217	109	42	--	--	2,926	34.1
16.8	--	10	--	35	--	--	--	--	--	--	45	0.5
16.9	2,390	1,097	967	128	--	--	--	--	--	--	4,582	53.4
17.1	26	46	--	8	--	--	--	--	--	--	80	0.9
17.9	--	--	--	--	--	--	--	5	--	--	5	0.1
Total	4,096	1,871	973	689	480	227	109	95	24	20	8,584	
Percent	47.7	21.8	11.3	8.0	5.6	2.6	1.3	1.1	0.3	0.2		

[1]Observation Time (minutes).
[2]PR=perched roosting, PW=perched watching, CL=perched close to mate, PP=perched preening, DW=drinking water, SS=standing on shore, SH=standing in water, PU=perched unknown, ET=eating in tree, PH=perched hunting.

APPENDIX Q: TOWER BREEDING AREA SUMMARY

Table 78. Observed human activity and bald eagle behavior, Tower BA, Arizona, 2006.

Human Activity	N[1]	W	R	F	B	U	X	Total	Percent
Train	13	98	--	8	7	21	1	148	46.7
Maintenance Car	15	30	--	1	8	18	--	72	22.7
Driver	19	--	--	--	4	1	1	25	7.9
Researcher	1	4	3	--	3	3	2	16	5.0
Small Plane	6	4	--	--	1	4	--	15	4.7
Helicopter	4	6	--	1	--	3	--	14	4.4
Gunshots	3	--	--	--	--	9	--	12	3.8
OHV	4	--	--	--	--	1	--	5	1.6
Camper	3	--	--	--	--	--	--	3	0.9
Agency Worker	1	--	--	--	1	--	--	2	0.6
Hiker	--	1	--	--	--	1	--	2	0.6
Canoe	1	--	--	--	--	--	--	1	0.3
Horseback Rider	1	--	--	--	--	--	--	1	0.3
Birder	1	--	--	--	--	--	--	1	0.3
Total	72	143	3	10	24	61	4	317	

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

Table 79. Observed forage events and success, Tower BA, Arizona, 2006.

Sex	Fish		Total	
	E[1]	S-U[2]	E	S-U
Male	2	0-2	2	0-2
Female	2	1-1	2	1-1
Unknown	2	0-2	2	0-2
Total	6	1-5	6	1-5

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

Table 80. Observed prey types delivered to the nest, Tower BA, Arizona, 2006.

Sex	Fish	Birds	Mammals	Unknown	Total	Percent
Male	7	1	--	4	12	35.3
Female	8	3	2	7	20	58.8
Unknown	1	--	--	1	2	5.9
Total	16	4	2	12	34	
Percent	47.1	11.8	5.9	35.3		

Table 81. Observed prey items delivered to the nest, Tower BA, Arizona, 2006.

Sex	Fish		Mammals	Total	Percent
	CC[1]	CP	RS		
Male	1	--	--	1	25.0
Female	--	1	2	3	75.0
Total	1	1	2	4	
Percent	25.0	25.0	50.0		

[1]CC=channel catfish, CP=carp, RS=rabbit species.

Table 82. Bald eagle habitat analysis at the Tower BA, Arizona, 2006.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
237.0	BA	Left	No	1	PO	CL
237.1a	SG	Left	No	1	PO	CL
247.1b	--	Left	No	2	RI	CL
247.2a	CF, CT	Left	No	1	PO	CL
247.2b	SJ	Left	No	1	PO	CL
247.2c	SJ	Right	No	2	PO	CL
247.3a	CF	Right	No	2	PO	CL
247.3b	CF	Left	No	1	PO	CL
247.3c	CT, SS	Right	No	1	PO	CL
247.3d	SJ	Right	No	2	PO	CL
247.4a	CF	Both	No	1	PO	CL
247.4b	CF	Right	No	2	PO	CL
247.4c	CT	Left	No	1	PO	CL
247.4d	SJ	Right	Yes	1	PO	CL
247.4e	SJ, SS	Left	No	2	PO	CL
247.5a	CF	Right	Yes	1	PO	CL
247.5b	CF	Left	Partial	1	PO	CL
247.5c	CF	Left	No	2	PO	CL
247.5d	CT	Both	No	1	PO	CL
247.5e	JN	Right	No	1	PO	CL
247.5f	SJ	Right	No	2	PO	CL
247.6a	CF	Right	No	2	PO	CL
247.6b	SJ	Right	Partial	1	PO	CL
247.6c	SO	Left	Yes	1	PO	CL
247.7a	CF	Right	Partial	1	PO	CL
247.7b	CF	Left	Yes	1	PO	CL
247.7c	CT, SH	Right	No	1	PO	CL
247.8a	BO	Left	No	2	RI	UP
247.8b	CF	Both	Partial	1	RI	CL
247.8c	CF	Left	No	2	RI	CL
247.8d	CT	Both	No	1	RI	CL
247.8e	SJ	Right	No	1	RI	CL
247.8f	SO	Left	No	1	RI	CL
247.9a	CF	Both	No	1	RI	CL
247.9b	CF	Left	No	2	RI	CL
247.9c	CT	Both	No	1	RI	CL
247.9d	--	Left	Yes	1	RI	MB
247.9e	SH	Right	No	1	RI	MB
248.0a	CF	Left	Partial	1	PO	CL
248.0b	CT	Both	No	1	PO	CL
248.0c	SJ	Right	No	1	PO	CL
248.0d	--	Right	No	3	PO	UP
248.1a	CF	Both	No	1	PO	CL
248.1b	CT	Both	No	1	PO	CL
248.1c	SJ	Right	No	1	PO	CL
248.1d	SJ	Right	Partial	1	PO	MB
248.2a	CF	Right	Yes	1	PO	CL
248.2b	CF	Left	Partial	1	PO	CL

[1]River kilometer (Hunt et. al. 1992).
[2]BA=cut bank, SG=soft snag, CF=cliff ledge, CT=cliff top, SJ=juniper snag, SS=shrub snag, JN=juniper, SO=shore, SH=hard snag, BO=boulder, ON=old nest, MS=mesquite, WO=willow, TP=telephone pole.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]PO=pool, RI=riffle, RU=run.
[5]CL=cliffs, UP=desert upland, MB=mesquite bosque, TA=talus slope, WT=willow thicket, RB=river bend.

Table 82. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
248.2c	CT	Both	No	1	PO	CL
248.2d	JN	Right	No	1	PO	CL
248.3a	CF, JN, SJ	Right	No	1	PO	CL
248.3b	CF	Left	Partial	1	PO	CL
248.3c	CT	Both	No	1	PO	CL
248.3d	ON	Right	Yes	1	PO	CL
248.4a	BO	Left	No	1	RU	TA
248.4b	CF	Left	No	1	RU	CL
248.4c	CF	Right	Partial	1	RU	CL
248.4d	CT	Both	No	1	RU	CL
248.4e	MS	Right	No	1	RU	CL
248.4f	SJ	Right	No	2	RU	UP
248.5a	CF, CT, SS	Right	No	1	RI	CL
248.5b	CF	Left	Yes	1	RI	CL
248.5c	SH, WO	Left	Yes	1	RI	WT
248.5d	SO	Left	Yes	1	RI	RB
248.5e	TP	Right	No	2	RI	UP
248.6a	BO	Left	Yes	1	RU	TA
248.6b	CF	Left	Yes	1	RU	CL
248.6c	CT	Left	No	1	RU	CL
248.7a	BO	Left	Yes	1	RI	TA
248.7b	CF	Right	No	1	RI	CL
248.8	CF, SJ	Left	No	1	PO	CL
250.4	BA	Right	No	1	RI	UP
250.8	UP	Left	No	1	PO	CL

[1]River kilometer (Hunt et. al. 1992).
[2]BA=cut bank, SG=soft snag, CF=cliff ledge, CT=cliff top, SJ=juniper snag, SS=shrub snag, JN=juniper, SO=shore, SH=hard snag, BO=boulder, ON=old nest, MS=mesquite, WO=willow, TP=telephone pole.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]PO=pool, RI=riffle, RU=run.
[5]CL=cliffs, UP=desert upland, MB=mesquite bosque, TA=talus slope, WT=willow thicket, RB=river bend.

Table 83. Bald eagle habitat use at the Tower BA, Arizona, 2006.											
River km	PW[1,2]	PU	PH	PV	PD	ES	PR	CL	PK	Total	Percent
247.1	48	136	28	--	--	--	--	--	--	212	1.9
247.2	49	186	146	--	--	--	--	--	--	381	3.4
247.3	328	548	82	--	--	--	--	--	--	958	8.6
247.4	34	139	12	--	--	--	--	--	--	185	1.7
247.5	82	35	273	--	--	--	--	21	--	411	3.7
247.6	183	8	--	--	--	2	--	--	--	193	1.7
247.7	254	11	45	--	3	--	--	--	--	313	2.8
247.8	274	13	184	--	48	34	--	--	--	553	5.0
247.9	115	61	47	--	--	--	34	--	71	328	3.0
248.0	1,172	11	38	3	80	--	23	--	--	1,327	11.9
248.1	1,836	139	164	--	7	--	27	9	--	2,182	19.6
248.2	259	14	18	--	--	--	--	--	--	291	2.6
248.3	401	42	4	5	--	--	14	--	--	466	4.2
248.4	1,103	186	252	423	--	--	--	63	--	2,027	18.2
248.5	858	20	93	73	--	67	--	--	2	1,113	10.0
248.6	7	35	2	--	--	--	--	--	--	44	0.4
248.7	10	--	--	--	--	--	--	--	--	10	0.1
248.8	74	--	8	5	--	--	--	--	--	87	0.8
250.4	30	--	--	--	--	--	--	--	--	30	0.3
Total	7,117	1,584	1,396	509	138	103	98	93	73	11,111	
Percent	64.1	14.3	12.6	4.6	1.2	0.9	0.9	0.8	0.7		

[1]Observation Time (minutes).
[2]PW=perched watching, PU=perched unknown, PH=perched hunting, PV= perched vocalizing, PD=perched drying, ES=eating on shore, PR=perched roosting, CL=perched close to mate, PK=perched with prey.