ARIZONA BALD EAGLE MANAGEMENT PROGRAM
2004 SUMMARY REPORT

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This report, in part, summarizes the results of monitoring by the Arizona Bald Eagle Nestwatch Program using the breeding area (BA) reports submitted by contractors in 2004. Those include: Steve Alsup and Lindsay Reynolds, Bartlett BA; Jean Carpenter and Ernie O'Toole, Box Bar BA; Sara Kennedy and Lyndsay Helleckson, Coolidge BA; Joe Peddie, Cresent BA; Suzanne Ehret and Robert Klotz, Ladders BA; Joe Peddie, Michele Young, Jean Carpenter, Luna BA; Belita Marine and Brian Gerber, Orme BA; Marie-France Julien and Melanie Pilon, Pinto BA; Adriane Albertowicz and Aran Meyer, Pleasant BA; Samantha Burrell and Carl Bullock, San Carlos BA; Jennifer Ottinger and Marion Finucane, Tonto BA; Chris Harrison and Joanie Smith, Tower BA.

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ARIZONA BALD EAGLE MANAGEMENT PROGRAM 2004 SUMMARY REPORT

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INTRODUCTION

In 1978, the U.S. Fish and Wildlife Service (USFWS) listed the bald eagle (*Haliaeetus leucocephalus*) as endangered under the Endangered Species Act (ESA) as amended (1973) in 43 states (including Arizona), and threatened in five others (USFWS 1982). In Alaska, the USFWS did not list the species and it does not occur in Hawaii. The USFWS downlisted the bald eagle to threatened in 1995 (USFWS 1995), and has proposed to delist in the future (USFWS 1999). Until delisting, the bald eagle remains protected under the ESA. Thereafter, the Airborne Hunting Act, the Bald and Golden Eagle Protection Act, the Lacey Act, the Migratory Bird Treaty Act, and Arizona Revised Statute Title 17 will protect the species.

To enhance coordination, increase communication, and provide oversight for Arizona bald eagle management, land and wildlife management agencies formed the Southwestern Bald Eagle Management Committee (SWBEMC) in 1984. The members include: Arizona Game and Fish Department (AGFD), Arizona Public Service (APS), Arizona State Parks Department, Army Corps of Engineers, Fort McDowell Yavapai Nation, Geo-Marine (U.S. Air Combat Command), Maricopa County Parks and Recreation Department (MCPRD), Salt River Pima-Maricopa Indian Community (SRPMIC), Salt River Project (SRP), San Carlos Apache Tribe (SCAT), Tonto Apache Tribe, U.S. Bureau of Indian Affairs, U.S. Bureau of Land Management, U.S. Bureau of Reclamation (USBR), U.S. Department of Defense (Luke Air Force Base), U.S. Forest Service (USFS), USFWS, U.S. National Park Service, and White Mountain Apache Tribe.

In the past, the Arizona Bald Eagle Management Program annually provided three separate technical reports summarizing Arizona Bald Eagle Winter Count, Arizona Bald Eagle Nest Survey, and the Arizona Bald Eagle Nestwatch Program (ABENWP). This year, we have compiled all of this information into one report.

STUDY AREA

Statewide monitoring and surveys were conducted within five 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 of Arizona's bald eagle breeding habitat exists between 329 and 1719 meters (1080 and 5640 ft) elevation in central Arizona (Fig. 1). These breeding areas (BAs) occur within riparian areas of the Upper and Lower Sonoran Life Zones and transition areas (Brown 1994). Plant species vary in each of the five biotic communities. Characteristic species of the Great Basin Conifer Woodland are juniper (*Juniperus spp.*) and pinyon (*Pinus spp.*). Interior Chaparral is represented by agave (*Agave spp.*), crucifixion thorn (*Canotia holocantha*), evergreen oaks (*Quercus spp.*), manzanita

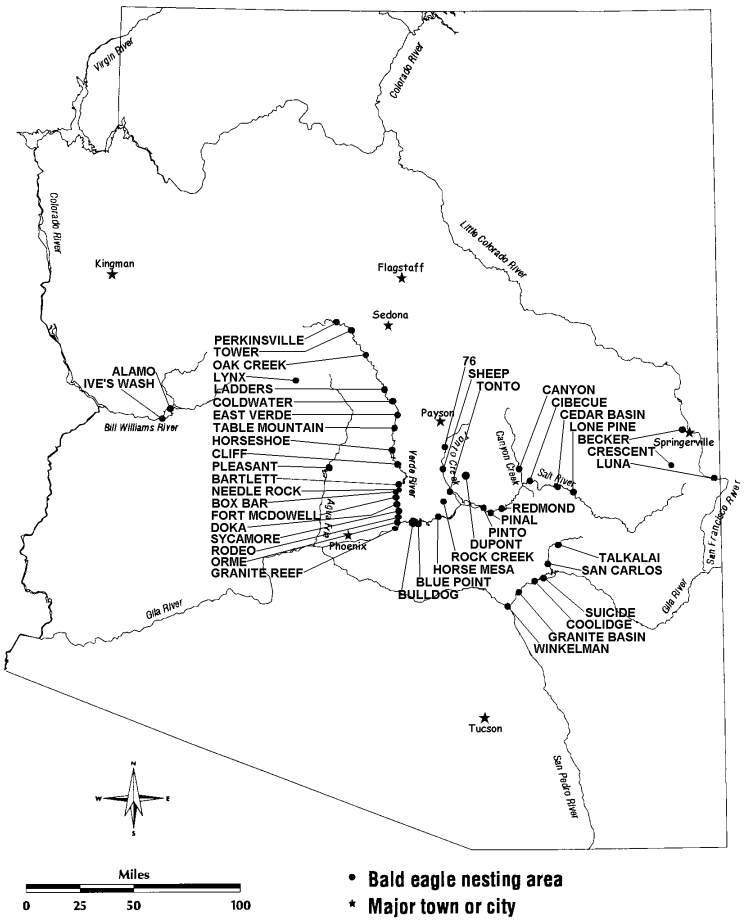

Figure 1. Location of known bald eagle BAs in Arizona, 2004.

(*Arctostaphylos spp*.), and skunkbush sumac *(Rhus trilobata*). Typical species of the Plains and Great Basin Grasslands include bluestem grasses (*Andropogon spp*.), teddy bear cholla (*Opuntia bigelovii*) and prickly pear cacti (*Opuntia spp.*), grama grasses (*Bouteloua spp*.), and sagebrush (*Artemisia spp*.). Species often found in the Rocky Mountain and Madrean Montane Conifer Forests are firs (*Abies* and *Pseudotsuga spp*.), Fremont cottonwood (*Populus fremontii*), oaks (*Quercus spp.*), pines (*Pinus spp*.) and spruces (*Picea spp*.). Common species in the Sonoran Desert-Arizona Upland Subdivision are barrel cacti (*Ferocactus spp*.), blue palo verde (*Cercidium floridum*), creosote bush (*Larrea tridentate*), foothill palo verde (*Cercidium microphyllum*), mesquite (*Prosopis spp*.), saguaro (*Carnegiea gigantea*), Goodding willow (*Salix gooddingii*), Arizona sycamore (*Platanus wrightii*), and introduced salt cedar (*Tamarix spp*.).

The Becker BA is within a Plains and Great Basin Grassland biotic community (Brown 1994). An isolated patch of cottonwoods along the eastern shore of Becker Lake creates local nesting habitat similar to the riparian areas of the Upper and Lower Sonoran Life Zones.

Crescent, Dupont, Luna, Lynx, and Rock Creek BAs are in Montane-Conifer Forest (Brown 1994). Representative vegetation includes; blue spruce (*Picea pungens*), Engelmann spruce (*Picea engelmannii*) white fir (*Abies concolor*), Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), quaking aspen (*Populus tremuloides*), Gambel oak (*Quercus gambelii*), and common juniper (*Juniperus communis*). Riparian vegetation includes narrowleaf cottonwood (*Populus angustifolia*), thinleaf alder (*Alnus tenuifolia*), Bebb's willow (*Salix bebbiana*) and coyote willow (*Salix exigua*). Dupont, Lynx, and Rock Creek BAs are located in isolated patches of ponderosa pine surrounded by Interior Chaparral, which consists mainly of pinyon-juniper woodland, shrub live oak (*Quercus turbinalla*), pointed and pringle manzanita (*Arctostaphylos pungens* and *pringlei*).

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, the identification of the bald eagle's winter distribution in Arizona was a goal in the 1982 Southwest Bald Eagle Recovery Plan (USFWS 1982). The knowledge of wintering bald eagle habitat use allows for the consideration and implementation of management to protect important wintering areas. Although the USFWS has proposed to delist the species, the importance of the national winter count remains. Through each state's consistent efforts, the winter count will continue to provide post-delisting data on national population fluctuations.

The National Wildlife Federation (NWF) initiated and organized the national bald eagle winter count from 1979-1991. Arizona contributed this information from the 1970's to the early 1980's (for example Todd 1981). However, in 1986 they changed survey protocol to only count areas of high bald eagle concentrations (routes with more than 15 bald eagles observed in two or more years). Due to Arizona's lack of "concentrations," 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 (for example Brown and Stevens 1992).

Arizona's statewide winter counts resumed in 1992, using a combination of terrestrial (foot, boat, snowmobile, vehicle) and aircraft surveys (for example Driscoll and others 2004). In 1995, AGFD and the NWF established 115 standardized routes for Arizona's bald eagle winter count. The U.S. Geological Survey Biological Resources Division, Snake River Field Station (USGS), now coordinates the national winter count effort.

METHODS

We continued to use, and strive to complete, the established 115 standardized survey routes for the 2004 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 6 to 12, 2004, which included weekdays for agency personnel and a weekend for volunteers. The short survey period minimizes the chance for any large-scale bald eagle movements between survey routes and related duplicate counts.

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

We classified the bald eagle sightings into adult, subadult, and unknown age classes. We advised the volunteers to be aware of the various near-adult plumages as they may be easily mistaken for full adult bald eagles. We also recorded sightings of golden eagles (*Aguila chrysaetos)* during the

survey, but did not report them in this document. We broke the data into two sections for comparison: 1) the terrestrial survey by county, and 2) the helicopter survey (Appendix A).

RESULTS AND DISCUSSION

The 2004 Arizona bald eagle winter count tallied 369 bald eagles (Table 1). We documented 243 adults (65.9%), 113 subadults (30.6%), and 13 unknown eagles (3.5%). The highest number of bald eagles occurred on the lower Black River (n=67). An additional 46 eagles were counted on non-standardized routes (Appendix A).

Table 1. Summary of the Arizona bald eagle winter count 2004 .

County	Routes	Minutes	Adult	Subadult	Unknown	Total	Total/minute
Verde River drainage	3	273	24	12	0	36	0.1319
Salt River drainage	11	251	98	38	0	136	0.5418
Gila River drainage	7	166	18	9	0	27	0.1627
Various helicopter	4	8	1	2	0	3	0.3750
Apache	17	706	9	5	4	18	0.0255
Cochise	2	183	1	1	0	2	0.0109
Coconino	29	4,137	45	20	6	71	0.0172
Graham	1	270	6	3	0	9	0.0333
Greenlee	1	50	0	0	0	0	0
Maricopa	Not Surveyed						
Mohave	4	1,458	11	3	0	14	0.0096
Navajo	19	819	24	17	2	43	0.0525
Pima	1	60	0	0	0	0	0
Pinal	1	40	0	0	0	0	0
Santa Cruz	4	240	0	0	0	0	0
Yavapai	6	1,926	6	3	1	10	0.0052
Yuma and LaPaz	Not Surveyed						
Totals	110	10,587	243	113	13	369	0.0349

Of the 115 standardized routes, Arizona completed 110 (95.7%). Surveyors spent a total of 10,587 minutes (176.5 hours) searching. The greatest survey effort was in Coconino County, where volunteers searched for 4,137 minutes (68.9 hours). The most efficient method of counting was by helicopter. We counted 202 bald eagles in 698 minutes (11.6 hours). This represented 0.2894 bald eagles observed per minute. The most efficient volunteer ground effort (in counties with more than one survey route) occurred in Navajo County where they observed 0.0525 bald eagles per minute.

The 369 bald eagles counted in the 2004 Arizona winter count was above the average 327 bald eagles counted annually since the survey routes were standardized in 1995 (Table 2). Including this year, Arizona counts an average of 332 bald eagles during the winter. In addition, we completed 110 (95.7%) of the 115 standardized routes. This matches the 2000 and 2003 surveys for the most routes completed.

In 2004, the percentage of adults (65.9%), subadults (30.6%), and unknown bald eagles (3.5%) counted was relatively similar to the national average of 67% adults from 1986-2000 (Steenhof and others 2002). Statewide winter counts from 1981 to 1985 and 1992 to 2003 averaged 64% adults (n=2951), 33% subadults (n=1534), and 2% unknown (n=115).

Arizona's extended drought has dried many high country lakes, smaller cattle tanks, and has lowered most of the larger reservoirs. Mild weather conditions during the 2003-2004 winter allowed existing waters to remain clear of ice, and the lack of precipitation minimized turbidity in the

flowing river systems. Even though open water was limited in certain areas, we believe the mild weather dispersed the bald eagles statewide. The only unexpected concentrations include 15 eagles at Rainbow Lake and 11 eagles at Showlow Lake. Historic record highs for these two survey sites were nine and five, respectively.

Table 2. Summary of Arizona bald eagle winter counts 1981-1985, 1992-2004.

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
Totals	115,575	0.0430	3194 (64.3%)	1647 (33.1%)	128 (2.6%)	4969

[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.

MANAGEMENT RECOMMENDATIONS

1. Continue to conduct the annual winter count with the 115 standardized routes.
2. Continue to encourage consistency by winter count surveyors to follow established routes and methods for long-term analysis potential.
3. Continue updating the Nongame Branch bald eagle winter count database with core information from the standardized survey forms.
4. Compile spatial data from winter count survey maps to document the location and abundance of wintering eagles, spatially identify important habitat use areas, and develop statewide maps for distribution to cooperating agencies.
5. Continue to document the location and cause of wintering bald eagle mortalities in Arizona, and follow up with appropriate management.

ARIZONA BALD EAGLE NEST SURVEY

INTRODUCTION

The bald eagle nest survey enhances our understanding of breeding bald eagle ecology in Arizona. Discovery of new BAs and alternate nests, coupled with the knowledge of current and historical BAs, allows for an accurate description of the distribution, status, and annual

productivity of Arizona's breeding population. Timely discovery of BAs also identifies sensitive areas requiring proactive management from potentially adverse impacts.

In 1972, concern about the bald eagle population's decline nationwide prompted surveys for the species throughout Arizona (Rubink and Podborny 1976). These annual surveys have continued to the present, excluding 1976 and 1977 (for example Canaca and others 2004). The AGFD administered and performed the 2004 nest survey, in cooperation with the SWBEMC.

METHODS

Habitat quality, the presence of nests, previous bald eagle sightings, and spacing prioritized survey areas. We monitored breeding activity at current and historical BAs, and nest sites discovered between 1992 and 2004 (for example Canaca and others 2004). We also investigated reports of bald eagles and nests by other agencies, biologists, and the public. A one to three person team conducted surveys between January and June 2004. 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 different breeding stages (that is incubation, nestling, fledgling).

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 (1998) to relocate historical BAs, and find alternate nests in existing BAs. Numbers assigned to new nests were consecutive with the last number assigned within that BA. Nest numbers assigned before this document are found in previous Arizona bald eagle nest survey reports (for example Canaca and others 2004).

Determination of breeding status followed operational definitions derived from Postupalsky (1974, 1983) and Steenhof and Kochert (1982) (Appendix B). "Tall" and "short," "large" and "small" are terms used in this report to describe heights of cliffs, and the size of trees and nests. "Tall" and "large" refer to substrates suitable for breeding bald eagles as compared to current Arizona bald eagle nests and locations. The terms "small" and "short" refer to structures of inadequate height and size.

RESULTS

We examined all known BAs (n=46) for breeding activity (Fig. 1). Of 40 occupied BAs, 39 pairs attempted to breed, and 27 pairs successfully produced 42 fledglings (Table 3, Appendix C). Significant findings of the 2004 nest survey include seven new alternate bald eagle nests and ten fallen nests.

Table 3. Summary of Arizona bald eagle productivity 2004.

Number of BAs	46	Number of Active BAs	39
Number of Occupied BAs	40	Number of Failed Breeding Attempts	12
Number of Eggs	59	Number of Successful Breeding Attempts	27
Nest Success = 27/40	0.68	Number of Young Hatched	50
Mean Brood Size = 42/27	1.56	Number of Young Fledged	42
		Productivity = 0.68 x 1.56	1.05

Results of the individual flights are located in Appendix D. Areas worthy of further discussion (bald eagle observations, fallen nests, new nests, potential nest sites) are described here. Nest locations are sensitive data, considered confidential by AGFD, and omitted from this report. Management agencies requiring specific locations should contact the AGFD Heritage Data Management System at (602) 789-3612.

New Locations Surveyed (Table 4)

Black River. – With suitable habitat on the lower Black River, we monitored this watershed for evidence of new BAs. Although two adult bald eagles were observed in March, no breeding activity was documented.

Burnt Point. - Over the past few years, we have received multiple reports of bald eagles: foraging on the Payson golf course, near Cold Springs, along the upper East Verde, and have recovered a dead adult bald eagle north of Payson. Those reports continued in 2004 with the sighting of a potential nest and adult bald eagles on the Mogollon Rim cliffs of Burnt Point, northeast of Payson. We surveyed the area in March and found several small nests, but no bald eagles.

Del Rio Ponds. - Isolated stands of cottonwood trees adjacent to the Del Rio ponds (south of Sullivan Lake in the Chino Valley) seem to attract wintering bald eagles. We surveyed in January, February, and March but found no nests or breeding activity.

Salt/Gila river confluence. - We received multiple reports of nesting bald eagles east of the confluence of the Salt and Gila rivers, West of Phoenix. A ground visit on January 14 and two helicopter surveys in February and March rendered no new nests, although one sub-adult bald eagle and four ospreys (*Pandion haliaetus*) were observed. Nesting substrate, open water, and foraging potential were available but sporadic. Many trees were small and water was often intermittent with dense overgrowth. However, waterfowl and fish concentrations seem to be sufficient to support a breeding pair.

Salt River/Tempe Town Lake. - During the winter, consultants with the Federal Aviation Administration reported sightings of bald eagles foraging on Tempe Town Lake, and possibly occupying a nest upstream near the Highway 101/202 interchange. Surveys in March and May yielded a red-tailed hawk (*Buteo jamaciensis*) nest, but no bald eagles were found.

Willow Springs Lake. – With the expansion of bald eagles in the White Mountains, we continue to survey the Mogollon Rim Lakes for bald eagle nests. In April, we found an osprey incubating in a new nest (#1) below the Willow Springs Lake dam and two osprey using the lake. In May, one adult bald eagle was observed at the SW end of the lake. No bald eagle nests or breeding activity was observed.

Table 4. 2004 Arizona bald eagle nest survey summary, new locations.

Location	Date	Survey Method	Results
Aqua Fria River	2/2, 3/12	Helicopter	No new nests or bald eagles.
Bear Canyon Lake	4/21, 5/4	Helicopter	No new nests or bald eagles. 4/21 - Two ospreys in area.
Big Lake	5/4	Helicopter	No new nests or bald eagles.
Black River	3/11	Helicopter	Two adults in area.
Blue Ridge Reservoir	4/21	Helicopter	No new nests or bald eagles.
Burnt Point	3/12	Helicopter	No new nests or bald eagles.

Table 4. continued.

Location	Date	Survey Method	Results
Del Rio Ponds	1/5, 2/2, 3/12	Helicopter	No new nests. 1/5 - Two adults and two sub adults in area. 2/2 - One adult and five subadults in area.
East Clear Creek	5/4	Helicopter	No new nests or bald eagles.
Gleason Flat	1/30, 3/11, 3/31	Helicopter	No new nests or bald eagles.
Goldwater Lake	2/2, 3/12	Helicopter	No new nests or bald eagles.
Hawley Lake	5/4	Helicopter	No new nests or bald eagles.
Horseshoe Cienega Lake	5/4	Helicopter	No new nests or bald eagles.
Lee Valley Reservoir	5/4	Helicopter	No new nests or bald eagles.
Pacheta Lake	5/4	Helicopter	No new nests or bald eagles.
Pecks Lake	1/5	Helicopter	No new nests or bald eagles.
Railroad Bridge	4/21, 5/3	Helicopter	No new nests or bald eagles.
Reservation Lake	5/4	Helicopter	No new nests or bald eagles.
Roosevelt Lake	1/6, 5/4, 6/6	Helicopter	No new nests. 1/6 - Eleven adults and ten subadults in area. 5/4 - One adult at each of the two major inflows. 6/6 - Four adults and three subadults on lake.
Salt/Gila Rivers	1/14, 2/2, 3/12	Ground Helicopter	No new nests. 2/2 - One subadult in area. 3/12 - Four ospreys in area.
Salt River/Tempe Town Lake	3/12, 5/3	Helicopter	No new nests or bald eagles. 3/12 - Red-tailed hawk nest.
Sunrise Lake	5/4	Helicopter	No new nests or bald eagles.
Willow Springs Lake	4/21, 5/4	Helicopter	4/21 - One osprey incubating in new nest #1 below dam. Two ospreys on lake. 5/4 - One adult perched on the SW end of lake.
West Clear Creek	1/5	Helicopter	No new nests. One adult in area.

Historical BAs (Table 5)

Bronco, Eagle, LF, Muldoon, Lost Mule (Natanes), Red Hill, Seven Mile, Sullivan, and Willow. – The Bronco, Eagle, LF, Muldoon, Lost Mule (Natanes), Red Hill, Seven Mile, Sullivan, and Willow historical BAs were documented by Hunt (1992). After researching the history of these BAs and applying our definitions, we found no evidence that bald eagles used or occupied these nests. Therefore, we have removed these BAs from their historical designation and placed them under Survey Sites with Existing Large Nests. Arizona now has 13 historical BAs.

Camp Verde. - Camp Verde BA has remained unoccupied after the only known nest was lost in the floods of 1993. We designated this BA as historical in 2004 after being unoccupied for ten consecutive years. No new nests or bald eagles were observed when we surveyed in February and March.

Table 5. 2004 Arizona bald eagle nest survey summary, historical BAs.

Location	Date	Survey Method	Results
Ash	1/6	Helicopter	No new nests. One adult in area.
Camp Verde	2/2, 3/12	Helicopter	No new nests or bald eagles.
Chino	3/12	Helicopter	No new nests or bald eagles.
Devil's Post	3/12	Helicopter	All known nests empty. One adult in area.
Mule Hoof	1/7, 1/30, 3/11, 5/4	Helicopter	All known nests empty. No bald eagles.

Survey Sites with Existing Large Nests (Table 6)
Chevelon. - The April and May flights in Chevelon Canyon were limited by high winds, however the existing nest was not observed on either and is presumed fallen. No new nests or bald eagles were observed.

Muldoon. - Bald eagles have been consistently observed in the Muldoon area on the January, February, and March flights since 2000. We again surveyed this area during these flights in 2004. Since all known nests were empty and no new nests have been found, we assume the bald eagles observed are wintering and using the unoccupied habitat of the upper Verde River.

Mogollon Rim Lakes. - Despite reports of bald eagle activity near the Mogollon Rim lakes, no new nests or breeding activity was documented in April and May. Ospreys with active nests at Knoll, Willow Springs (see New Locations Surveyed), and Woods Canyon lakes suggest there is a sufficient prey base for bald eagles to occupy these in the future.

Table 6. 2004 Arizona bald eagle nest survey summary, nest sites.

Location	Date	Survey Method	Results
Chevelon	4/21, 5/4	Helicopter	No new nests or bald eagles. 5/4 – Nest #1 fell.
Eagle	1/8	Helicopter	No new nests. One adult in area.
Granite	1/5, 2/2, 3/12	Helicopter	All known nests empty. No bald eagles.
Hell Point	1/5, 2/2, 3/12	Helicopter	All known nests empty. 1/5 – One adult in area.
Knoll Lake	4/21, 5/4	Helicopter	No new nests or bald eagles. 4/21 – One osprey incubating in nest #1.
LF	1/5, 3/12	Helicopter	No new nests. 1/5 – Two adults in area.
Muldoon	1/5, 2/2, 3/12	Helicopter	All known nests empty. 1/5 – Three subadults in area. 2/2 – One adult in area. 3/12 – One adult in area.
Sullivan Lake	1/5, 2/2, 3/12	Helicopter	No new nests or bald eagles.
Willow	1/8	Helicopter	No new nests or bald eagles.
Woods Canyon	4/21, 5/4	Helicopter	No new nests or bald eagles. 4/21 - One osprey incubating. Two ospreys on lake.

Breeding Areas (Table 7)
Canyon. - Canyon nest #8 fell before January, and nest #5 had fallen by March. All known nests were empty and no bald eagles were observed when surveyed on five flights.

Cedar Basin. - In March, we located a new sycamore tree nest (#8) 13 km upstream from nest #3.

Cibecue. - In March, a golden eagle was incubating in nest #6. In May, an addled egg was observed in nest #2 suggesting the pair laid eggs and failed, although no bald eagles were observed on the four previous flights.

Cliff. - A single adult was observed in January and March. No new nests were found.

Coldwater. - Nest #1 fell before January, and nest #3 fell before the February.

Granite Reef. - In January, we found two adults in a new cottonwood tree nest (#4) downstream of nest #2.

Lone Pine. – In January, one adult was found standing in a new sycamore tree nest (#5) upstream from nest #2.

Lynx. – After loosing nest #1 on April 1, 2003, we surveyed the lake by helicopter from January to March 2004. In March, we found an adult incubating in a new ponderosa pine tree nest (#2) approximately 0.5 km from the lake.

Pinto. - In January, we found an adult standing in a new cottonwood tree nest (#6). The new nest is located on Meddler Point, upstream of Campaign Bay.

Rodeo. - Nest #1 fell before January.

San Carlos. - Nest #2 fell before January.

76. - In January, we found the supporting branch for nest #3 had broken and two adults in the area. In February, we found a new nest #4 in the same tree as nest #3, and one adult in the area.

Sheep. - In January, we found the supporting branch for nest #3 broke. In February, we found one adult incubating in a new cottonwood tree nest #4.

Winkelman. - Nest #2 fell before January.

Table 7. 2004 Arizona bald eagle nest survey summary, breeding areas.

Location	Date	Survey Method	Results
Canyon	1/6, 1/30, 3/11, 3/31, 5/4	Helicopter	1/6 – Nest #8 fell. 3/11 – Nest #5 fell. All known nests empty. No bald eagles.
Cedar Basin	1/7, 1/30, 3/11, 5/4	Helicopter	1/7 – Two adults upstream. 1/30 – Two adults upstream. 3/11 – New nest #8.
Cibecue	1/7, 1/30, 3/11, 5/4	Helicopter	3/11 – Golden eagle incubating in nest #6. 5/4 – Addle egg in nest #2.
Cliff	1/5, 2/2, 3/12, 5/3	Helicopter	1/5 – One adult in area. 3/11 – One adult downstream of nest area.
Coldwater	1/5, 2/2, 3/12, 5/3, 6/6	Helicopter	1/5 – Nest #1 fell. 2/2 - Nest #3 fell.
Dupont	1/30, 3/11	Helicopter	All known nests empty. No bald eagles.
Granite Basin	1/6, 1/30, 3/11, 3/31	Helicopter	All known nests empty. No bald eagles.
Granite Reef	1/6, 1/30	Helicopter	1/6 – Two adults standing in new nest #4.
Lone Pine	1/7, 1/30, 3/11, 5/4, 6/6	Helicopter	1/7 – Two adults and two subadults in area. 1/30 – One adult standing in new nest #5.
Lynx	2/2, 3/12, 5/3, 6/6	Helicopter	2/2 – One adult and three subadults in area. 3/12 – One adult incubating in new nest #2.
Pinto	1/6, 1/30	Helicopter	1/6 – One adult standing in new nest #6. 1/30 – Two adults standing in nest #6.
Rodeo	1/5	Helicopter	Nest #1 fell.
San Carlos	1/6	Helicopter	1/6 – Nest #2 fell.
76	1/6, 1/30, 3/31, 5/4	Helicopter	1/6 – Nest #3 supporting branch fell. Two adults in area 1/30 – Found new nest #4. One adult in area.

Table 7. continued.

Location	Date	Survey Method	Results
Sheep	1/6, 1/30, 3/31, 5/4, 6/6	Helicopter	1/6 – Nest #3 supporting branch fell. 1/30 – One adult incubating in new nest #4.
Winkelman	1/6, 1/30, 3/11	Helicopter	1/6 – Nest #2 fell. No new nests or bald eagles.

Overview

Significant findings of the 2004 Arizona Bald Eagle Nest Survey include the discovery of seven new alternate nests and ten nests that had fallen. The Camp Verde BA was designated historical after being unoccupied for ten consecutive years. The Bronco, Eagle, LF, Muldoon, Lost Mule (Natanes), Red Hill, Seven Mile, Sullivan, and Willow BAs were reclassified as Nest Sites upon review of historical literature and the applications of our definitions.

Nest surveys in the White Mountains and Mogollon Rim area will require more attention as the population grows. In the White Mountains, bald eagle breeding activity has expanded to include the Crescent Lake BA which successfully produced young this year. Considering some of the Luna Lake fledglings are of breeding age, the Crescent BA is now productive, and the bald eagle's high natal area fidelity, the White Mountains may become increasingly important for high elevation breeding bald eagles. The Mogollon Rim has suitable nesting substrate and hatchery-stocked lakes to support breeding pairs as well. The level of bald eagle reports and a May sighting of an adult at Willow Springs Lake indicate their breeding distribution may be expanding.

The continued creation and loss of alternate nests, coupled with the expansion and distribution of Arizona bald eagles, further demonstrates the necessity and importance of ORA flights. These flights allow for consistent monitoring of population numbers, distribution, and their reproductive success in the rugged terrain of Arizona. Without the aid of these flights, we would not be able 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. This suggests that the current distribution of our population may extend into Sonora, Mexico. Identifying breeding bald eagles, through banding, visual identification and transmitters would clarify the extent of which our population reaches into Sonora, and would help to accurately describe our survivorship estimates.
3. Surveyors should continue to use the nest survey, ORA, and winter count flights, in concert with follow-up ground surveys to inspect areas. From the air, surveyors can easily cover large sections of bald eagle habitat. Follow-up ground surveys thoroughly investigate an area.
4. Examine the following areas for breeding bald eagles and/or nests:
   - Agua Fria River drainage – Up and downstream from Lake Pleasant.
   - Big Sandy River drainage - Upper Trout Creek.
   - Bill Williams River drainage - Bill Williams National Wildlife Refuge

- Black River drainage - Little and Big Bonito creeks to the confluence of the Black River, Paucity Creek, Pacheta Creek, Reservation Creek, osprey nesting areas on East and West Fork and main stem of the Black River.
- Central and Eastern Mountain Lakes – Bear Canyon, Black Canyon, Blue Ridge, Casadore Springs, Chevelon Canyon, Cholla, Christmas Tree, Doney Park, Dry, George's Basin, Knoll, Nash Creek, Phillips Park Tank, Paucity Lake, Point of Pines, Roger's, Tonto, Willow Springs.
- Colorado River drainage - Lake Mead (Grand Wash), Gene Wash Reservoir, Nankoweap Creek, Lee's Ferry.
- Little Colorado River drainage – Forest Service Road 113 to Lyman Lake.
- 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 - Blue Point BA to Orme BA, Gun/Tonto creek confluence, Mormon Flat Dam, Redmond BA to Canyon BA, Cibecue BA to Cedar Basin BA, Tanks Canyon.
- White Mountain Lakes – Big Lake, Canero Lake, Lee's Valley Lake, Nelson Reservoir, Nutrioso, Sierara Blanca Lake.
- White River – Whiteriver to confluence with Black and Salt rivers.

ARIZONA BALD EAGLE NESTWATCH PROGRAM

INTRODUCTION

In 1978, USFS biologists and two Maricopa Audubon Society volunteers began to monitor bald eagles near Bartlett Reservoir to understand the effects of recreation. This monitoring effort eventually expanded to other BAs, and developed into the ABENWP. In 1984, 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 needs of Arizona's breeding bald eagles, the ABENWP operates with three 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 management agencies make better bald eagle management decisions, nestwatchers collect basic demographic information and behavioral responses to human activities. Possibly the most tangible benefit of the ABENWP is determining when the bald eagles are in life threatening situations. Daily monitoring allows biologists to intervene in these situations, and eliminate/reduce the threat.

In this report, we summarize significant discoveries at each monitored BA in 2004. 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, Pleasant, and Tower), those without (Coolidge, Crescent, Orme, Pinto, San Carlos, and Tonto), and those monitored for opportunistic information (Granite Reef and Needle Rock). In the fall of 2003, we advertised the ABENWP contract positions through the American Ornithologists Union Newsletter, American Birding Associations Job Listing, AGFD Internet site, SWBEMC internet site, Society for Conservation 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 two orientation meetings, and several question and answer sessions for the selected ABENWP contractors. The first two meetings offered an introduction to the program, background and the ABENWP's role in bald eagle management, and an explanation of data forms and emergency protocols. After the orientation meetings, the contractors chose a partner and BA, and were taken into the field. The question and answer sessions occurred after the first ten-day work period, and before every other ten-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 6, 2004, and continued until nestlings fledged. Teams of two nestwatchers maintained a ten days on/four days off schedule. During each ten-day work period, weekend observations were conducted from dawn-to-dusk to cover times of high recreation use, and document the resulting habitat use of the breeding pair. Monday through Thursday observations were a minimum of eight hours with emphasis on identifying territory boundaries, home range, and overall habitat use of the breeding pair.

Nestwatchers recorded bald eagle behavior and recreation use data from assigned observation points (OP's) within the BA. We selected OP's to provide optimal viewing while minimizing the impact to the breeding bald eagles. Alternate OP's were identified when the breeding pair utilized areas out of the primary OP's view. Nestwatchers were provided spotting scopes, Motorola radios, cellular telephones, and/or USFS radios for viewing and communication needs. We supplied BA maps with river kilometer designations, and a guide to commonly taken fish species. They recorded all bald eagle behavioral data on supplied field forms. Nestwatchers provided their own transportation, gas, 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 seven categories: none, watched, restless, flushed, left area, bird not in area, and unknown. If the bald eagles performed their normal activities without acknowledging the human activity, nestwatchers recorded a "none" response. "Watched" was a bald eagle looking in the direction of the human activity without displaying any other observable reaction. If the bald eagle vocalized and/or moved noticeably without leaving the nest or perch, nestwatchers recorded "restless." If a bald eagle left its location quickly in response to a human activity, nestwatchers recorded a "flushed" response. "Left area" was recorded when a bald eagle became intolerant and flew 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 and Box Bar BAs, nestwatchers recorded human activity different 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 BA 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 behaviors at the nest.

Management considerations included in this report are taken directly from the individual BA reports and therefore are not the opinions of the authors or AGFD. We have included them as informational material for land and wildlife management agencies reviewing this report, and for further discussion at SWBEMC meetings.

RESULTS AND DISCUSSION

The ABENWP monitored 14 BAs in 2004. Those include: Bartlett, Box Bar, Coolidge, Crescent, Granite Reef, Ladders, Luna, Needle Rock, Orme, Pinto, Pleasant, San Carlos, Tonto, and Tower. The final status of monitored BAs was three failed, 11 successful, and 17 young fledged (Appendix C).

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

Bartlett Breeding Area

Observation Period. – February 6 to June 2. Total monitoring 87 days/898 hours.

Eagle Identification. – The male is unbanded in adult plumage. The female is blue visual identification (VID) banded on her left leg, USFWS banded on the right leg, and in adult plumage. She is possibly the 1995 Tonto nestling identified previously as the Bartlett male.

Management Activities. – 1) The USFS reinstated the seasonal BA closure. 2) The male and female nestlings were VID banded "17/C" and "17/D" at 4.5 weeks of age, respectively.

Human Activity. – Nestwatchers recorded 306 human activities (Appendix E). Aircraft (small planes, helicopters, and jets) represented 90.5% of reported activity, watercraft 5.2% (canoe/kayak, rafter, and boaters), and terrestrial activity 4.2% of three different types. Eight activities elicited 12 significant responses from the breeding pair. The bald eagles were restless to three off-highway vehicles (OHVs), and one small plane and helicopter each. The breeding pair flushed in response to one small plane, helicopter, canoe/kayak, rafter, boater, and researcher each, and left the area in response to one boater while docking on shore.

Food Habits. – Nestwatchers observed 32 forage attempts. The male was successful in 43.7% (n=7) and the female in 62.5% (n=10). Fish accounted for 90.6% of the attempts, 3.1% mammals, and 6.2% unknown items. The breeding pair delivered 79 items to the nest. The male delivered 87.3% and the female 12.7%. The most common prey type was fish (81.0%), although birds (6.3%), mammals (5.1%), and unknown prey (7.6%) were taken. No prey items were identified to species.

Habitat Use. – The Bartlett nestwatchers identified 84 perch locations along the Verde River and four perch locations on Bartlett Lake. River perches spanned 5.5 km ranging from river kilometer (rk) 31.6 to 37.1 and lake perches spanned 7.3 km ranging from lake kilometer (lk) 42.3 to 49.6. The pair spent 75.2% of their time within the immediate nesting area between rk 34.6 and 34.9, 14.8% at rk 34.4, and 10% at the remaining perch locations. No boat was available to follow, locate, and document the pair's use of Bartlett Lake, therefore information on lake habitat use is limited.

Box Bar Breeding Area
Observation Period. – February 6 to April 25. Total monitoring 50 days/498 hours.

Eagle Identification. – The male is blue VID banded "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).

Management Activities. – 1) The USFS reinstated the seasonal BA closure. 2) The owners of Rio Verde Ranch allowed ABENWP to camp and monitor from their lawn. 3) ABENWP contractors were active in educating the public visiting the Rio Verde Ranch and the campground at the end of USFS road 161. 4) The two male nestlings were VID banded "16/C" and "16/D at 5.5 weeks of age and fitted with satellite transmitters at nine weeks of age.

Human Activity. – Nestwatchers recorded 71 human activities within the closure (Appendix F). Aircraft activity (helicopters, small planes, and motor para-gliders) represented 56.3%, terrestrial activity represented 42.3% of seven different types, and watercraft 1.4%. Three activities elicited three significant responses from the breeding pair. The bald eagles were restless to one gunshot, and flushed in response to one ATV and hiker each.

Food Habits. – Nestwatchers observed three forage attempts. The male made one unsuccessful attempt for a fish and the female successfully caught two suckers on two attempts. The breeding pair delivered 91 items to the nest. The male delivered 58.2% (n=53) and the female 41.8% (n=38). The common prey types were fish (34.1%), mammals (19.8%), and unknown items (39.6%). No prey were identified to species.

Habitat Use. – The Box Bar nestwatchers identified 11 habitat use areas that spanned a 2.8 km stretch of the Verde River ranging from rk 23.1 to 25.9. The pair spent 42.0% of their time at rk 23.1, 35.1% at rk 25.0, 9.4% at rk 23.9, and 13.5% at the remaining perch locations.

Coolidge Breeding Area

Observation Period. – February 7 to May 2. Total monitoring 96 days/777 hours.

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

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) The one male nestling was VID banded "17/V" at 5.5 weeks of age.

Interventions. – On June 16, ABENWP contractors observed the 11.5 week old nestling motionless in the nest. AGFD biologists recovered the nestling on June 17. Heat stress was the likely cause of death.

Human Activity. – Nestwatchers recorded 48 human activities (Appendix G). Terrestrial activities of six types accounted for 62.6% and aircraft (small planes, jets, and helicopters) for 37.4%. Two activities elicited two significant responses from the breeding pair. The bald eagles left the area in response to one jet and helicopter each.

Food Habits. – Nestwatchers observed 26 forage attempts. The male was successful in 50.0% (n=5), the female in 68.8% (n=11). Of these attempts, fish accounted for 61.5%, mammals 15.4%, birds 11.5%, amphibians 3.8%, and unknown 7.7%. The breeding pair delivered 19 prey items to the nest. The male delivered 47.4%, and the female 52.6%. The common prey type was fish (89.4%), although amphibians and mammals were also taken (5.3% each). Of the nine items that could be identified to species, six were carp (*Cyprinus carpio*), two were catfish (*Ictalurus punctatus*), and one was a sucker (*Catostomus spp.*).

Habitat Use. – The Coolidge nestwatchers identified 136 separate perch locations along the Gila River. River perches spanned a total of 3.8 km ranging from rk 23.9 to 27.7. The breeding pair spent 58.0% of the time directly in the nest area, 15.9% at rk 24.8, and 26.1% at the remaining perch locations.

Crescent Breeding Area

Observation Period. – March 10 to June 3. Total monitoring 45 days/263 hours.

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

Management Activities. – 1) ABENWP contractors were active in educating the visiting public and talked to fisherman at Crescent Lake.

Human Activity. – Nestwatchers recorded 528 human activities (Appendix H). Terrestrial activities represented 90.5% of four different types, 7.6% watercraft (boats, canoe/kayaks, and float tube), and aircraft (small planes) 1.9%. Fishermen accounted for 98.3% (n=470) of the terrestrial activities. Two activities elicited 11 significant responses from the breeding pair. The bald eagles flushed in response to two fishermen and hikers each, and left the area in response to seven fishermen.

Food Habits. - Nestwatchers observed 60 forage attempts. The male was successful in 76.3% (n=29) forage attempts, the female in 86.4% (n=19). Of these attempts, 90.0% were for fish, 6.7% carrion, and 3.3% reptiles. The breeding pair delivered 34 prey items to the nest. The male delivered

61.8%, and the female 38.2%. Of prey items, the most common prey type was fish (79.4%), although carrion (11.8%), reptiles (5.9%), and mammals (2.9%) were also delivered. Of the three items that could be identified to species, two were Garter Snakes (*Thamnophis spp.*) and one was a muskrat (*Ondatra zibethicus*).

Habitat Use. – The Crescent nestwatchers identified 12 separate perch locations around the lake. Perches spanned a total of 0.8 km ranging from lk 1.9 to 2.7. The pair spent 62.4% of their time at the nest (lk 2.2), 14.9% at lk 2.4, and 22.7% at the remaining ten perch locations.

Ladders Breeding Area

Observation Period. – February 6 to June 25. Total monitoring 104 days/878 hours.

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

Management Activities. – 1) The USFS reinstated a seasonal breeding area closure surrounding the nest area. 2) The USFS posted closure signs at the upstream and downstream access points to the Verde River. 3) The USFS provided contractors with a camping trailer. 4) Two male nestling were VID banded "17/R" and "17/S" at six weeks of age.

Interventions. – On May 6 during a banding trip, the nestlings were both were underdeveloped. The older nestling 17/S was underdeveloped by one week and the younger 17/R by two weeks. On May 16, the nestling banded 17/R died at 7.5 weeks of age in the nest with no obvious injuries. A combination of heat stress, competition with the larger sibling, and a Mexican Chicken Bug (MCB) infestation was the likely cause of death.

Human Activity. – Nestwatchers recorded 261 human activities (Appendix I). Aircraft (small planes, helicopters, and motorized parachute) represented 41.4%, watercraft (canoe/kayak, boater, and float tube) 39.0%, and terrestrial activities of seven different types 19.6%. Three activities elicited nine significant responses from the breeding pair. The bald eagles were restless in response to two helicopters, and one canoe/kayak and agency worker each. The pair flushed to two canoe/kayaks and agency workers each, and the breeding pair left the area in response to one canoe/kayak.

Food Habits. – Nestwatchers observed 38 forage attempts. The male was successful in 54.8% (n=17) and the female in 42.9% (n=3). Of these attempts, 71.0% were for fish, 7.9% birds, 5.3% mammals and reptiles each, and 10.5% unknown. The breeding pair delivered 86 prey items to the nest. The male delivered 73.3% and the female 26.7%. The common prey types consisted of fish (87.2%), and unknown (7.0%). Of the 35 items that could be identified to species, 80% were sucker, 14.3% carp (*Cyprinus carpio*), 2.9% channel catfish, and 2.8% Sonoran mudturtle (*Kinosternon sonoriense*).

Habitat Use. – The Ladders nestwatchers identified 159 perch locations along the Verde River. River perches spanned a total of 6.4 km ranging from rk 157.7 to 164.1. The pair spent 65.7% of the observed time near the nest (rk 162.9), and 34.3% at the remaining perch locations.

Luna Breeding Area

Observation Period. – February 6 to June 6. Total monitoring 93 days/877 hours.

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

Management Activities. – 1) The USFS reinstated the seasonal BA closure. 2) Nestwatchers were stationed at the boat ramp to talk to fisherman launching boats. 3) The USFS housed the nestwatchers in a trailer. 4) The two male nestlings were VID banded "16/H" and "16/K" at 5.5 weeks of age.

Human Activity. – Nestwatchers recorded 864 human activities (Appendix J). Terrestrial activities represented 61.5% of eight different types, watercraft (boats, canoe/kayaks, and float tube) 36.9%, and aircraft (jets and planes) 1.6%. Eight activities elicited 44 significant responses from the breeding pair. The bald eagles were restless in response to five picnickers and two jets. The breeding pair left the area in response to 18 canoe/kayaks, eight fishermen, five construction events, three agency workers, two snowmobiles, and one float tube.

Food Habits. – Nestwatchers observed 152 forage attempts. The male was successful in 49.0% (n=50) forage attempts, the female in 56.0% (n=28). Of these attempts, 59.2% were for birds, 27.6% fish, and 13.2% unknown. The breeding pair delivered 98 prey items to the nest. The male delivered 60.2%, the female 29.6%, and an unknown adult 10.2%. Of these prey items, fish accounted for 38.8%, birds 37.8%, carrion 14.3%, mammals 3.1%, and unknown 6.1%. Of the 64 items that could be identified to species, 59.4% were rainbow trout (*Oncorhynchus mykiss*) and 40.6% American coots (*Fulica americana*).

Habitat Use. – The Luna nestwatchers identified 16 separate perch locations around the lake. Perches spanned a total of 4.8 km ranging from lk 0.3 to 5.1. The pair spent 43.3% of their time at the nest (lk 2.3), 39.0% at lk 2.5, and 17.7% spent at the remaining 14 perch locations.

Orme Breeding Area

Observation Period. – February 7 to May 16. Total monitoring 80 days/620 hours.

Eagle Identification. – The male and female are unbanded and in adult plumage. The Orme male is in a polygynous relationship with the female from the Rodeo BA.

Management Activities. – 1) The SRPMIC continues to restrict non-tribal member use of the river area. 2) The SRPMIC Police visited the ABENWP contractors on a daily basis and patrolled the nesting area during times of elevated recreation use. 3) Two male nestlings were banded "16/M" and "16/N" at 5.5 weeks of age and one (16/N) was fitted with a satellite transmitter at nine weeks of age.

Human Activity. – Nestwatchers recorded 252 human activities (Appendix K). Aircraft (planes, jets, ultra-lights, and helicopters) represented 57.5%, terrestrial activity 40.5% of 13 different types, and watercraft (rafters and canoe/kayaks) 2.0%. Nine activities elicited 15 significant responses by the breeding pair. The bald eagles were restless to one vehicle and flushed in response to four drivers, two canoes/kayaks, one helicopter, small plane, swimmer, birder, and agency worker each. The breeding pair left the area in response to one helicopter, agency worker, and rafter each.

Food Habits. – Nestwatchers observed 34 forage attempts. The male was successful in 66.7% (n=4) attempts, the female in 59.3% (n=16), and an unknown adult in 100% (n=1). The most common forage item was fish 58.8%, although birds 2.9%, and unknown prey types 38.2% were also hunted.

The breeding pair delivered 53 prey items to the nest. The male delivered 28.3%, and the female 71.7%. Fish composed 60.4% of those items, 1.9% birds, and 37.7% unknown. No prey items were identified to species.

Habitat Use. – The Orme nestwatchers identified ten separate perch locations along the Verde and Salt Rivers. River perches spanned a total of 10.5 km ranging from rk 0.3 to 4.2 on the Verde River and rk 4.4 to 10.8 on the Salt River. The pair spent 93.5% of the time within the immediate nesting area between rk 0.3 to 0.4 (Verde River) and rk 5.2 to 5.3 (Salt River), and 6.5% spent at the remaining five perch locations.

Pinto Breeding Area
Observation Period. – February 10 to May 21. Total monitoring 67 days/592 hours.

Eagle Identification. – The male is blue VID band "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 Closure limited recreational activities on the west side of the Salt River.

Human Activity. – Nestwatchers recorded 16 human activities (Appendix L). Terrestrial activity of three different types and watercraft (rafter, canoe) accounted for 37.5% each, and aircraft (helicopters) 25%. Two activities elicited a significant response from the breeding pair. The breeding pair flushed in response to one helicopter and driver each.

Food Habits. – No forage attempts or prey deliveries were observed.

Habitat Use. – The Pinto nestwatchers identified 17 separate perch locations along the Salt River. River perches spanned a total of 3.9 km ranging from rk 101.6 to 105.5 on the Salt River. The breeding pair spent 91.7% of the time at three perch locations within the nest area (rk 104.3), and 8.3% at the remaining perch locations.

Pleasant Breeding Area
Observation Period. – February 7 to May 12. Total monitoring 66 days/609 hours.

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

Management Activities. – 1) MCPRD reinstated the seasonal closure around the active nest. 2) MCPRD marked closure boundaries with buoys and signs. 3) Nestwatchers were stationed at the southern closure boundary to educate recreationists on the closure and bald eagles. 4) The female nestling was VID banded "16/U" at six weeks of age.

Human Activity. – Nestwatchers recorded 115 human activities (Appendix M). Aircraft (small planes, helicopters, jets, and ultra-lights) represented 46.1%, watercraft (boats, skiers, and jet skis) 36.5%, and terrestrial activities (OHV and fishermen) 17.4%. Four activities elicited eight significant responses by the breeding pair. The bald eagles flushed to three boats, two helicopters, two jet skis, and one fisherman. Of the 1,482 watercraft that approached the southern buoy line, only 57 (3.8%) did not comply (agency boats omitted). Boats represented 94.7% of those non-

complying, and 5.3% jet skis. However, within the type of watercraft, only 4.2% of the boats and 2.1% of the jet skis did not comply with the closure. In addition, 78.9% of the violations occurred on a weekend.

Food Habits. – Nestwatchers observed 12 forage attempts. The male (n=6) and female (n=3) were successful in all forage attempts, an unknown adult was successful in 50.0% (n=1), however tandem hunting (n=1) proved unsuccessful. Seventy-five percent of the attempts were for fish, 16.7% birds, and 8.3% reptiles. The breeding pair delivered 58 prey items to the nest. The male delivered 44.8%, the female 31.0%, and an unknown adult 24.1%. Prey items were comprised of 22.4% fish, 3.4% birds, 1.7% reptiles, and 72.4% unknown. Two prey items were identified to species with one smallmouth (*Micropterus dolomieui*) and largemouth bass (*Micropterus salmoides*) each.

Habitat Use. – The Pleasant nestwatchers identified 17 separate perch locations on the Agua Fria arm of Lake Pleasant. Perches spanned a total of 0.6 km ranging from rk 68.7 to 69.3. The breeding pair spent 63.6% of the time at the nest (rk 60.9), 21.2% at rk 68.9b, and 15.1% spent at the remaining 15 perch locations.

San Carlos Breeding Area
Observation Period. – February 6 to May 9. Total monitoring 70 days/701 hours.

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

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.

Human Activity. – Nestwatchers recorded 491 human activities (Appendix N). Terrestrial activity of 19 types accounted for 97.6% and aircraft (small planes, jets, helicopter, and ultra lights) 2.4%. Eight activities elicited 15 significant responses from the breeding pair. The bald eagles were restless to four jets, and one driver, OHV, woodcutter, ultra light, and helicopter each. The breeding pair flushed in response to four hikers, and one researcher, and left the area in response to one hiker.

Food Habits. – Nestwatchers observed eight forage attempts. The male was successful in 80.0% (n=4), and the female and an unknown adult in all attempts (n=2 and n=1 respectively). Successful foraging attempts consisted of 37.5% fish and mammals each, and 25% carrion. The breeding pair delivered 56 prey items to the nest. The male delivered 66.1%, the female 26.8%, and an unknown adult 7.1%. Of the delivered items, 51.8% were fish, 16.1% birds, 3.6% carrion, and 28.6% unknown. Of the 12 items that could be identified to species, 25.0% were suckers and American coots each, 16.7% black crappie (*Pomoxis nigromaculatus*) and carp each, and 8.3% largemouth bass and goldfish (*Carassius auratus*) each.

Habitat Use. – The San Carlos nestwatchers identified 15 separate perch locations along the San Carlos River and four along San Carlos Reservoir. River perches spanned a total of 5.0 km ranging from rk 9.5 to 14.5 and lake perches spanned 8.0 km ranging from lk 12.0 to 20.0. The breeding pair spent 93.2% of the time directly in the nest area and 6.8% at the remaining 14 perch locations.

Tonto Breeding Area
Observation Period. – February 7 to May 23. Total monitoring 73 days/633 hours.

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

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.

Human Activity. – Nestwatchers recorded 39 human activities (Appendix O). Aircraft (small planes and helicopters) accounted for 53.8%, and terrestrial activity 46.2% of six different types. One activity elicited two significant responses from the breeding pair. The breeding pair flushed and left the area in response to one agency worker each.

Food Habits. – The nestwatchers observed opportunistic pirating by both breeding adults, but these events were not part of established patterns. Similar to previous years, they regularly observed the adults returning from the vicinity of Roosevelt Lake with prey items. The breeding adults delivered 106 prey items to the nest. The male delivered 50.9%, and the female 49.1%. Of these items, 69.8% were fish, 4.7% mammals, 2.8% birds, 0.9% carrion and reptiles each, and 20.8% unknown. No prey items were identified to species.

Habitat Use. – The Tonto nestwatchers identified 14 separate perch locations along the Tonto Creek. River perches spanned 1.2 km ranging from rk 16.1 to 17.3. The breeding pair spent 97.2% of the observed time within the nest tree (rk 16.7) and 2.8% spent at the remaining 13 perch locations.

Tower Breeding Area
Observation Period. – February 6 to May 5. Total monitoring 65 days/630 hours.

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

Management Activities. – 1) The USFS reinstated a seasonal breeding area closure surrounding the nest area. 2) The USFS posted closure signs at the upstream and downstream access points to the Verde River. 3) The USFS provided contractors with a camping trailer. 4) The female nestling was VID banded "17/E" at six weeks of age.

Interventions. – On May 5, the nestling pre-fledged at nine weeks of age. The nestling was found dead directly below the nest with no obvious injuries. The nest harbored a MCB infestation that likely caused the death of the 2003 nestlings. The combination of heat stress and a MCB infestation is the likely cause of this years failure.

Human Activity. – Nestwatchers recorded 108 human activities (Appendix P). Terrestrial activities of 12 different types represented 62.0%, aircraft (small planes and helicopters) 34.3%, and watercraft (canoe/kayak and rafters) 3.7%. Six activities elicited 15 significant responses from the breeding pair. The bald eagles flushed to eight trains, three rafters, and one researcher, small plane, and OHV each, and left the area in response to one shooter.

Food Habits. – Nestwatchers observed seven forage attempts. The male was successful in 33.3% (n=1) and the female in 50.0% (n=2). Fish accounted for 57.1% of the attempts and unknown 42.9%. The breeding pair delivered 26 prey items to the nest. The male delivered 34.6%, the female 57.7%, and an unknown adult 7.7%. Fish comprised 69.2% of those items, 7.7% birds, 3.8% mammals, and 19.2% unknown. No prey items were identified to species.

Habitat Use. – The Tower nestwatchers identified 50 perch locations along the Verde River. River perches spanned a total of 15.2 km ranging from rk 236.5 to 251.7. The pair spent 67.0% of the observed time near the nest (rk 248.2), 17.5% at rk 248.1, and 15.5% at the remaining 48 perch locations.

OTHER INTERVENTIONS

Granite Reef Breeding Area

On February 11, we responded to a report of an injured adult bald eagle at the Granite Reef nest. The injured adult was retrieved and taken to Liberty Wildlife Rehabilitation Center where it was euthanized. On February 12, the female began to abandon the nesting attempt. We retrieved and placed the eggs in an incubator at Liberty Wildlife Rehabilitation Center. On March 6, the two eggs hatched, however, one nestling died two days later. On April 12, the surviving nestling was banded "16/W" and successfully fostered into the active Horseshoe BA nest. On May 10, we deployed a solar-powered satellite transmitter on the fosterling, and it later fledged.

MANAGEMENT CONSIDERATIONS

Bartlett Breeding Area

1. Check cable barrier and signs at the beginning of each breeding season.
2. Provide brochures to nearby airports.
3. Update public use maps to include current roads and breeding area closures.
4. Monitor the pollution in Bartlett Reservoir.
5. Continue efforts to deploy breeding adults with transmitters.

Box Bar Breeding Area

1. Increase presence of Law Enforcement personnel during weekends.

Coolidge Breeding Area

1. Investigate techniques for increasing shade at the nest.
2. Maintain steady water releases from the dam until nestlings fledged.

Crescent Breeding Area

1. Place a closure around BA.
2. Implement the Monofilament Recovery Program at Crescent Lake and Big Lake.

Ladders Breeding Area

1. Place an educational sign with a photo and a map of the closure boundary at Beasley Flat informing boaters and recreating public about bald eagle natural history.

Luna Breeding Area

1. Post bald eagle closure information at the campground kiosk.
2. Establish an island within the closure for waterfowl breeding habitat.
3. Additional trash receptacles throughout parking and camping areas.

Orme Breeding Area
1. Cooperation with FMYN should be sought.
2. If complete closure of the Orme BA was desired by SRPMIC, a locked chain between two poles would prevent vehicle access on roads entering the closure.
3. Provide additional trashcans at the confluence area where recreation pressure is high.
4. Permanently close the road that runs directly behind the Orme nest.
5. Tonto National forest should inform its guests of area boundaries.
6. Organize river clean-ups.

Pinto Breeding Area
1. Replace and update existing signs at the entrance to FR 333.
2. Access to FR 333 should be blocked by a gate during breeding season.

Pleasant Breeding Area
1. Have park employees distribute written and/or oral information about the Agua Fria closure to visitors.
2. Provide better markings delineating closure on jeep/ATV trail and more buoys at the southern end of the closure.
3. Printing information about the closure in the newspaper (sports section).
4. Inform the airport south of Carefree Highway and the Air Force Base that there is a 2,000 ft advisory above the BA.
5. More law enforcement at the closure on the weekends.

San Carlos Breeding Area
1. Create a management scheme where regeneration can sustain both the habitat and woodcutting.
2. Only call law enforcement when serious threat to the breeding attempt or nestwatchers is imminent.

Tonto Breeding Area
1. Monitor effects of Bermuda flats campground and boat density on eagle foraging sites.

Tower Breeding Area
1. Replace lock on the green gate that closes the jeep trail at the Sycamore canyon parking lot.
2. Post closure sign on FR9507 in a place where turning around is possible or install a gate.
3. Extend closure.

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APPENDIX A: 2004 ARIZONA BALD EAGLE WINTER COUNT RESULTS

Table 8. 2004 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	20	2	0	0	0
2	Little Colorado River (LCR)	20	1	0	0	0
3	S. Fork LCR – Campground	23	0	0	0	0
4	Casa Malapais – LCR	20	2	2	0	3
5	Greer Lakes (River, Bunch, and Tunnel Reservoirs)	22	0	0	0	0
6	Sponseller Lake	15	0	0	0	0
7	Mexican Hay Lake	60	0	0	0	0
8	White Mountain Hereford Ranch (Trinity, Glen Livet, McKay reservoirs)	45	1	0	0	0
9	The Ranch Lake	25	0	0	0	0
10	Ortega Lake	25	0	0	0	0
11	Concho Lake	30	1	1	0	0
12	Luna Lake	53	0	0	0	0
13	Nelson Reservoir	55	0	0	0	0
14	Nutrioso Reservoir	36	1	1	0	0
15	Tenney Pond	20	0	0	0	0
16	San Francisco River (Alpine RD to New Mexico)	24	1	1	0	1
17	Campbell Blue Creek	213	0	0	0	
Total		**706**	**9**	**5**	**0**	**4**
Cochise County						
18	Parker Canyon Lake	90	1	1	0	0
19	Willcox Playa	Not Surveyed				
20	Sulphur Springs Valley – Whitewater Draw	93	0	0	0	0
Total		**183**	**1**	**1**	**0**	**0**
Coconino County						
21	Long Lake Complex	340	5	4	3	0
22	Stoneman Lake	265	0	2	0	0
23	FH3	145	1	0	0	0
24	I-17, Sedona to Flagstaff	175	2	1	0	0
25	Bellemont	342	0	1	0	0
26	Townsend/Winona A/B	390	1	1	0	0
27	HWY 89 North/Sunset Crater – Wupatki	375	1	0	0	0
28	FH3 Lakes (Mary, Mormon, Marshall, Prime)	577	5	2	0	0
29	Continental Country Club Lakes	170	0	0	0	0
30	Chevelon Canyon Lake	145	4	2	1	1
31	Holden Lake	15	0	0	0	0
32	Spring Valley Wash	180	2	0	0	0
33	Red Lake Valley	120	1	0	0	0
34	Kaibab Lake	58	1	0	0	0
35	Pittman Valley	40	3	1	0	0
36	Davenport Lake	15	3	0	0	0
37	Scholz Lake	40	4	1	0	0
38	Cataract Lake	15	2	0	0	0

Table 8. continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Coconino County (continued)						
39	Willow Springs Lake	105	1	0	0	0
40	West Chevelon Canyon	65	1	0	0	0
41	Willow Creek	50	0	0	0	0
42	White Horse Lake – Pomeroy Tanks	30	1	1	0	0
43	JD Dam Lake	45	2	3	0	1
44	Barney Flat Wetland	15	0	0	0	0
45	Steel/Stone Road	90	0	0	0	0
46	Pine Flat	40	1	0	0	0
47	Boggy Tank	60	1	0	0	0
48	Blue Stem Wash-Babbitt property	185	0	0	0	0
49	Glen Canyon Nat'l Rec Area (Lee's Ferry)	45	3	1	0	0
50	Colorado River, Lee's Ferry to Little Colorado River	Not Surveyed				
Total		**4,137**	**45**	**20**	**4**	**2**
Grahm County						
51	Point of Pines Lake Area	270	6	3	0	0
Greenlee County						
52	Greys Peak	50	0	0	0	0
Maricopa County						
53	Painted Rock Reservoir	Not Surveyed				
Mohave County						
54	Lake Mohave	330	2	1	0	0
55	Havasu National Wildlife Refuge, Topock Marsh	198	0	0	0	0
56	Lake Mead, Temple Bar	900	7	1	0	0
57	Alamo Lake	30	2	1	0	0
Total		**1,458**	**11**	**3**	**0**	**0**
Navajo County						
58	Lake of the Woods	25	0	0	0	0
59	Rainbow Lake	60	5	10	0	0
60	Little Mormon Lake	16	0	0	0	0
61	Whipple Lake	34	0	0	0	0
62	Long Lake	41	0	0	1	0
63	Lone Pine Lake	60	0	1	0	0
64	Schoens Reservoir	60	0	0	0	0
65	White Mountain Lake	47	0	0	0	0
66	Dry Lake	65	0	0	0	0
67	Jacques Marsh	65	4	2	0	1
68	Scott's Reservoir	25	0	0	0	0
69	Showlow Lake	81	8	3	0	0
70	Pintail Lake	15	1	0	0	0
71	Telephone Lake	15	1	1	0	0
72	Fool Hollow Lake	150	5	0	0	0
73	Fred's Lake	10	0	0	0	0
74	Edeler's Lake	15	0	0	0	0
75	Cottonwood Wash/Clay Springs	27	0	0	0	0
76	White Lake	8	0	0	0	0
Total		**819**	**24**	**17**	**1**	**1**
Pima County						
77	Arivaca Lake	60	0	0	0	0

Table 8. continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Pinal County						
78	Picacho Reservoir	40	0	0	0	0
Santa Cruz County						
79	Bog Hole	60	0	0	0	0
80	Patagonia Lake	90	0	0	0	0
81	San Raphael Valley	60	0	0	0	0
82	Pena Blanca Lake	30	0	0	0	0
Total		**340**	**0**	**0**	**0**	**0**
Yavapai County						
83	Wet Beaver Creek	465	2	0	0	1
84	Oak Creek	480	1	0	0	0
85	Willow Lake	250	1	0	0	0
86	Lynx Lake	251	1	0	0	0
87	Watson Lake	240	0	0	0	0
88	Goldwater Lake	240	1	3	0	0
Total		**1,926**	**6**	**3**	**0**	**1**
Yuma and LaPaz Counties						
89	Imperial National Wildlife Refuge Cibola/Martinez Lake – Colorado River	Not Surveyed				

Table 9. 2004 Arizona bald eagle winter count helicopter survey results.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
90	Verde River	228	21	11	0	0
91	Lower East Verde River	17	2	1	0	0
92	Lower West Clear Creek	28	1	0	0	0
93	Lower Salt River	25	21	12	0	0
94	Upper Salt River	62	7	2	0	0
95	Lower Tonto Creek	27	3	0	0	0
96	Lower Cherry Creek	2	0	0	0	0
97	Lower Canyon Creek	7	0	0	0	0
98	Lower Cibecue Creek	11	0	0	0	0
99	Lower Carrizo Creek	3	0	0	0	0
100	White River	16	1	1	0	0
101	North Fork White River	30	10	2	0	0
102	Lower Black River	45	47	20	0	0
103	Big and Little Bonito Creeks	23	9	1	0	0
104	San Carlos River (Talkalai Lake)	17	1	0	0	0
105	San Carlos Reservoir	13	1	5	0	0
106	Upper and Lower Gila River	34	5	0	0	0
107	Eagle Creek	37	8	3	0	0
108	Bonita Creek	16	0	0	0	0
109	Lower San Francisco River	36	2	1	0	0
110	Blue River	13	1	0	0	0
111	Sunrise Lake	3	1	0	0	0
112	Big Lake	2	0	0	0	0
113	Lee Valley Reservoir	1	0	0	0	0
114	Crescent Lake	2	0	2	0	0
115	Lake Pleasant	Not Surveyed				
Totals		698	141	61	0	0

Table 10. 2004 Arizona bald eagle winter count non-standardized route results.

Route Name	County	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Camp Clover	Coconino/Yavapai	130	3	2	0	1
Camp Navajo	Coconino	215	2	0	0	0
FR 35 & 27	Coconino/Yavapai	360	0	0	0	0
Garland Prairie	Coconino	150	2	1	0	1
HWY 64	Coconino	15	1	0	0	0
HWY 64 East	Coconino	30	1	0	0	0
HWY 87 South	Coconino	150	0	0	0	0
HWY 87 North	Coconino	70	1	0	0	0
HWY 180	Coconino	210	1	2	0	0
Johnson Canyon	Coconino	30	3	0	0	0
Kachina Sewage Treatment Plant	Coconino	30	0	0	0	0
Loop Road	Coconino	300	2	1	0	0
Moqui Road #328	Coconino	50	0	0	0	0
O'Dell	Coconino	58	3	2	0	0
Partridge Creek	Coconino	300	2	1	0	0
Upper Basin – FR 307	Coconino	120	0	0	0	0
Lake Mohave	Mojave	--	8	4	0	0
Mortenson Wash	Navajo	120	2	0	0	0
Camp Verde	Yavapai	35	0	0	0	0
Totals		2373	31	13	0	2

APPENDIX B: RAPTOR REPRODUCTIVE STATUS CRITERIA

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

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

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

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

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

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

Failed BA/Nest: An occupied nest from which no young fledged due to any cause.

Historical BA: A BA that has remained unoccupied for ten consecutive years. Given that some records of breeding occupancy are sparse in the literature before 1973, this term also applies to any BA recorded not showing signs of occupancy since.

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: 2004 ARIZONA BALD EAGLE PRODUCTIVITY

Table 11. 2004 Arizona bald eagle productivity.

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Alamo	F	4	1/4-2/2	1+	Failed 2/2-26.			
Bartlett*	S	1	2/2-2/5	2+	3/2	2	2	6/2-6/7
Becker	U							
Blue Point	S	10	<4/6	2+	<4/6	2	2	4/21-5/4
Box Bar*	S	3	<1/5	2+	2/2-2/6	2	2	4/16
Bulldog	S	1	<1/6	2+	1/30-3/8	2	2	5/4-6/7
Canyon	U							
Cedar Basin	O	5						
Cibecue	F	2	<5/4	1	Found one egg in nest on 5/4.			
Cliff	U							
Coldwater	S	3	2/2-3/12	1+	3/12-4/6	1	1	>6/7
Coolidge*	F	4	2/16-2/20	1+	3/28	1	Failed 6/17.	
	One nestling died at 11.5 weeks of age.							
Crescent*	S	1	3/24-4/6	1+	4/22-5/6	1	1	7/25
Doka	S	2	<1/2	2+	1/5-2/2	2	2	3/31-4/21
Dupont	U							
East Verde	S	6	2/2-3/12	2+	3/12-4/6	2	1	5/4-6/7
	One nestling last observed on 5/4 at 7.5 weeks of age.							
Fort McDowell	S	16	1/5-2/2	2+	2/2-3/12	1	1	5/3-6/7
Granite Basin	U							
Granite Reef*	F	4	1/30-2/2	2	Failed 2/12.			
	Nest abandoned 2/12. Two eggs taken to rehab. Fostered 4/12 into Horseshoe.							
Horse Mesa	F	4	1/6-1/30	1+	Failed 2/2-3/2.			
Horseshoe	S	11	1/5-2/2	1+	2/2-3/12	1	2	5/3-6/7
Ive's Wash	S	3	1/4-2/2	3	2/18-2/25	3	3	>5/3
Ladders*	S	3	2/16-2/20	2+	3/26, 3/28	2	1	6/24
	One nestling died 5/16 at five weeks of age from emaciation related to MCB infestation.							
Lone Pine	S	5	1/30-3/11	2	3/11-5/4	1	1	>6/7
Luna*	S	1	<2/6	2+	3/5-3/19	2	2	5/26, 5/31
Lynx	S	2	<3/12	1+	<3/12	1	1	5/3-6/7
Needle Rock*	S	2	1/5-2/2	1+	3/8-3/12	1	1	5/3-6/7
Oak Creek	F	1	1/5-2/2	1+	2/11-3/12	1	Failed 3/12-4/6.	
	Last observed brooding on 3/12.							
Orme*	S	6	1/6-1/30	2+	2/25	2	2	5/16, 5/19
Perkinsville	F	4	1/5-2/2	1+	2/19-3/12	1	Failed 5/29	
	Nestling taken to rehab on 5/29 for broken wing. Died 6/9.							
Pinal	S	2	1/6-1/30	1+	3/11-3/17	1	1	5/4-6/7
Pinto*	S	6	1/30-2/6	2+	2/29	2	2	5/23-6/7
Pleasant*	S	3	<2/2	1+	2/27	1	1	5/14-5/30
Redmond	S	5	1/30-3/11	2	3/11-3/16	1	1	5/4-6/7
Rock Creek	F	1	1/30-3/11	1+	Failed 3/31.			
Rodeo	S	2	1/5-2/2	2+	2/2-3/12	2	1	5/3-6/7
	One nestling disappeared 3/31-5/3 at 3.5 to 9.5 weeks of age							
San Carlos*	S	3	1/6-1/30	1+	2/21	1	1	5/11-5/16
76	F	4	2/23-3/11	1+	Failed 3/11-3/18.			
Sheep	F	4	1/6-1/30	1+	2/25-3/11	1	Failed 5/4-6/7.	
	Nestling disappeared 5/4-6/7 at seven to 11.5 weeks of age.							
Suicide	S	1	1/6-1/30	3	2/9-3/2	3	3	>5/7
Sycamore	S	4	<1/2	2+	1/5-2/2	2	2	3/31-4/21

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

* 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
Table Mountain	F	4	2/2-3/12	1+	3/12-4/6	1	Failed 5/3-6/7.	
	One nestling disappeared 5/3-6/7 at three to eight weeks of age.							
Talkalai	S	7	2/6-2/8	1+	3/11-4/13	1	1	>6/1
Tonto*	S	2	1/6-1/30	2+	2/22	2	2	5/16, 5/22
Tower*	F	8	1/2-1/25	1+	3/1-3/4	1	Failed 5/5.	
	One nestling died 5/5 at nine weeks of age related to MCB infestation.							
Winkelman	U							

[1] Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.
* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

APPENDIX D: 2004 NEST SURVEY RESULTS

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

Location	Time	Comments
January 5, 2004		
Orme	0823	All known nests empty. No bald eagles.
Rodeo	0827	Nest #1 fell. One adult in area.
Sycamore	0832	One adult incubating in nest #4. Second adult in area.
Doka	0838	One adult incubating in nest #2. Second adult in area.
Fort McDowell	0840	Two adults standing in nest #16.
Box Bar	0842	One adult incubating in nest #3.
Needle Rock	0844	All known nests empty. One adult in area.
Bartlett	0849	All known nests empty. No bald eagles.
Cliff	0930	All known nests empty. One adult in area.
Horseshoe	1003	All known nests empty. One adult in area.
Table Mountain	1024	One adult standing in nest #4.
LF nest site	1054	Two adults in area.
East Verde	1102	All known nests empty. No bald eagles.
Coldwater	1113	Nest #1 fell. All known nests empty. No bald eagles.
Ladders	1324	All known nests empty. No bald eagles.
West Clear Creek	1334	No new nests. One adult in area.
Oak Creek	1434	All known nests empty. One adult in area.
Pecks Lake	1452	No new nests or bald eagles.
Tower	1503	All known nests empty. No bald eagles.
Perkinsville	1515	All known nests empty. No bald eagles.
Hell Point nest site	1531	One adult in area.
Muldoon nest site	1536	Three subadults in area.
Granite nest site	1541	All known nests empty. No bald eagles.
Sullivan Lake nest site	1544	No new nests or bald eagles.
Del Rio Ponds	1548	Two adults and two sub adults in area.
January 6, 2004		
Granite Reef	0755	Two adults in new nest #4
Orme	0757	All known nests empty. No bald eagles.
Bull Dog	0807	One adult incubating in nest #1.
Blue Point	0810	All known nests empty. No bald eagles.
Horse Mesa	0835	All known nests empty. No bald eagles.
Tonto	0848	All known nests empty. One adult in area.
Sheep	0918	Nest #3 branch broke. All known nests empty. No bald eagles.
76	0927	Nest #3 branch broke. Two adults in area.
Roosevelt Lake	0973	No new nests. Eleven adults and ten subadults in area.
Pinto	1137	One adult standing in new nest #6.
Pinal	1147	All known nests empty. One adult in area.
Redmond	1203	One adult standing in nest #5. Second adult in area.
Canyon	1230	Nest #8 gone. All known nests empty. No bald eagles.
Ash historical BA	1249	No new nests. One adult in area.
Talkalai	1317	No new nests or bald eagles.
San Carlos	1334	Nest #2 fell. All known nests empty. One adult in area.
Suicide	1350	All known nests empty. Two adults in area.
Coolidge	1400	All known nests empty. Two adults in area.
Granite Basin	1436	All known nests empty. No bald eagles.
Winkelman	1444	Nest #2 fell. All known nests empty. No bald eagles.
January 7, 2004		
Cibecue	1028	All known nests empty. No bald eagles.
Mule Hoof historical BA	1042	All known nests empty. No bald eagles.
Cedar Basin	1055	All known nests empty. Two adults upstream.

Table 12. continued.

Location	Time	Comments
January 7, 2004 continued		
Lone Pine	1113	All known nests empty. Two adults and two subadults in area.
Crescent	1223	All known nests empty. Two subadults in area.
January 8, 2004		
Willow nest site	1007	No new nests or bald eagles.
Eagle nest site	1039	No new nests. One adult in area.
January 30, 2004		
Granite Reef	0834	One adult in nest #4.
Orme	0835	One adult incubating in nest #6.
Bull Dog	0841	One adult incubating in nest #1.
Blue Point	0844	All known nests empty. No bald eagles.
Horse Mesa	0900	One adult incubating in nest #4.
Rock Creek	0905	All known nests empty. No bald eagles.
Tonto	0908	One adult incubating nest #2.
Sheep	0915	One adult incubating in new nest #4.
76	0925	New nest #4 in former nest #3 tree. One adult in area.
Dupont	0943	All known nests empty. No bald eagles.
Pinto	0955	Two adults standing in nest #6.
Pinal	0959	One adult incubating in nest #6.
Redmond	1003	All known nests empty. No bald eagles.
Gleason Flat	1014	No new nests or bald eagles.
Canyon	1020	All known nests empty. No bald eagles.
Cibecue	1142	All known nests empty. No bald eagles.
Mule Hoof historical BA	1150	All known nests empty. No bald eagles.
Cedar Basin	1207	All known nests empty. Two adults upstream.
Lone Pine	1220	One adult standing in new nest #5.
Talkalai	1440	One adult standing in refurbished nest #7. Second adult in area.
San Carlos	1420	One adult incubating in nest #3.
Suicide	1430	One adult incubating in nest #1.
Coolidge	1435	All known nests empty. No bald eagles.
Granite Basin	1505	All known nests empty. No bald eagles.
Winkelman	1526	No new nests or bald eagles.
February 2, 2004		
Granite Reef	0739	One adult incubating in nest #4. Second adult in area.
Orme	0741	One adult incubating in nest #6.
Rodeo	0744	One adult incubating in nest #2. Second adult in area.
Sycamore	0748	One adult incubating in nest #2. Second adult in area.
Doka	0752	One adult brooding one one-week old nestling in nest. Second adult in area.
Fort McDowell	0755	One adult incubating in nest #16.
Box Bar	0759	One adult incubating in nest #3.
Needle Rock	0800	One adult incubating in nest #2.
Bartlett	0805	All known nests empty. No bald eagles.
Cliff	0824	All known nests empty. No bald eagles.
Horseshoe	0845	One adult incubating in nest #11.
Table Mountain	0858	All known nests empty. No bald eagles.
East Verde	1004	One adult standing in nest #6. Second adult in area.
Coldwater	1014	Nest #3 fell. All known nests empty. No bald eagles.
Ladders	1025	All known nests empty. One adult and two subadults in area.
Camp Verde historical BA	1035	No new nests or bald eagles.
Oak Creek	1052	One adult incubating in nest #1.
Tower	1117	One adult incubating in nest #8
Perkinsville	1126	One adult incubating in nest #4.
Hell Point nest site	1132	No new nests or bald eagles.

Table 12. continued.

Location	Time	Comments
February 2, 2004 continued		
Muldoon nest site	1142	All known nests empty. One adult in area.
Granite nest site	1148	All known nests empty. No bald eagles.
Sullivan Lake nest site	1151	No new nests or bald eagles.
Del Rio Ponds	1156	One adult and five subadults in area.
Lynx	1335	One adult and three subadults in area.
Goldwater Lake	1341	One adult in area.
Alamo	1421	One adult incubating in nest #4.
Ive's Wash	1427	One adult incubating in nest #3.
Pleasant	1548	One adult incubating in nest #3.
Salt/Gila Rivers	1610	One subadult in area.
March 11, 2004		
Granite Reef	0734	All known nests empty. Two adults in area.
Bull Dog	0741	One adult brooding in nest #1.
Blue Point	0744	All known nests empty. No bald eagles.
Horse Mesa	0812	Nest empty, confirmed failed.
Rock Creek	0815	One adult incubating in nest #2.
Sheep	0830	One adult incubating in nest #4. Second adult in area.
76	0837	One adult incubating in nest #4. Second adult in area.
Dupont	0849	All known nests empty. No bald eagles.
Pinto	0900	One adult incubating in nest #6. Second adult in area.
Pinal	0904	One adult brooding one 1.5-week old nestling in nest.
Redmond	0908	One adult incubating in nest #5.
Gleason Flat	0913	No new nests or bald eagles.
Canyon	0930	All known nests empty. No bald eagles. Nest #5 fell.
Cibecue	1115	All known nests empty. No bald eagles. Golden eagle incubating in nest #6.
Mule Hoof historical BA	1125	All known nests empty. No bald eagles.
Cedar Basin	1200	New nest #8. One adult in area.
Lone Pine	1210	One adult incubating in nest #5. Second adult in area.
Black River	1214	Two adults in area
Talkalai	1413	One adult incubating/brooding in nest #7.
San Carlos	1424	One adult brooding.
Suicide	1428	Two 1.5-week old nestlings in nests and one adult in nest.
Coolidge	1430	One adult incubating. Second adult in area.
Granite Basin	1458	All known nests empty. No bald eagles.
Winkelman	1500	No new nests or bald eagles.
March 12, 2004		
Salt River/Tempe Town Lake	0725	Red-tailed hawk nest
Rodeo	0740	One adult sitting low on nest on nest #2.
Sycamore	0746	Two seven-week old nestlings in nest.
Doka	0750	Two seven-week old nestlings in nest. One adult in area.
Fort McDowell	0754	One adult standing in nest. One three-week old nestling in nest. One egg.
Needle Rock	0800	One adult feeding, one one-week old nestling in nest.
Bartlett	0804	One adult brooding.
Cliff	0830	One adult downstream of nest area.
Horseshoe	0842	One adult incubating/brooding in nest #11.
Table Mountain	0848	One adult incubating in nest #4.
East Verde	0900	One adult standing in nest #6 with possible egg. Second adult in area.
Coldwater	0908	One adult incubating in nest #4.
LF nest site	0925	No new nests or bald eagles.
Burnt Point	0952	No new nests or bald eagles.

Table 12. continued.

Location	Time	Comments
March 12, 2004 continued		
Camp Verde historical BA	1058	No new nests or bald eagles.
Oak Creek	1110	One adult incubating/brooding in nest #1.
Perkinsville	1133	One adult standing in nest with one one-week old nestling in nest.
Hell Point nest site	1142	All known nests empty. No bald eagles.
Muldoon nest site	1147	All known nests empty. One adult in area.
Granite nest site	1150	All known nests empty. No bald eagles.
Sullivan Lake nest site	1155	No new nests or bald eagles.
Del Rio Ponds	1200	No new nests or bald eagles.
Lynx	1212	One adult incubating in new nest #2.
Goldwater Lake	1217	No new nests or bald eagles.
Devil's Post historical BA	1400	All known nests empty. One adult in area.
Chino historical BA	1425	No new nests or bald eagles.
Alamo	1430	All known nests empty. One adult on lake.
Ive's Wash	1437	One adult shading two+ two-week old nestlings in nest.
Agua Fria River	1553	No new nests or bald eagles.
Salt/Gila Rivers	1620	No new nests or bald eagles. Four ospreys in area.
March 31, 2004		
Pleasant	0643	One five-week old nestling in nest.
Horseshoe	0700	One adult standing on nest with a three-week old nestling in nest.
76	0720	All known nests empty. No bald eagles.
Sheep	0730	One adult incubating. Second adult in area.
Tonto	0734	One adult on nest with two 4.5-week old nestlings in nest. Second adult in area.
Rock Creek	0740	All known nests empty. No bald eagles. Failed.
Pinto	0750	One adult on nest with two three-week old nestlings in nest. Second adult in area.
Pinal	0754	One adult incubating/brooding.
Redmond	0800	One adult on nest with one three-week old nestling in nest. Second adult in area.
Gleason Flat	0809	No new nests or bald eagles.
Canyon	0818	All known nests empty. No bald eagles.
Suicide	1129	One adult on nest with three 3.5-week old nestlings in nest. Second adult in area.
Coolidge	1132	One adult brooding. Second adult in area.
Granite Basin	1140	All known nests empty. No bald eagles.
Bull Dog	1220	One adult on nest with two four-week old nestlings in nest.
Orme	1225	One adult on nest with one four-week old nestling in nest.
Rodeo	1227	One adult on nest with two three-week old nestlings in nest.
Sycamore	1230	Two 11-week old nestlings in nest.
Doka	1232	Two 11-week old nestlings in nest.
Fort McDowell	1235	One adult on nest with one five-week old nestling in nest.
Box Bar	1237	One adult on nest with two nine-week old nestlings in nest.
Needle Rock	1238	One adult on nest with one three-week old nestling in nest. Second adult in area.
April 6, 2004		
Ive's Wash	0900	Banded three four-week old nestlings in nest. Two adults in area.
Alamo	1159	All known nests empty. Two adults in area.
Perkinsville	1445	One adult with one 3.5-week old nestling in nest.
Oak Creek	1500	All known nests empty. No bald eagles. Failed.
Coldwater	1514	One adult brooding.
East Verde	1522	Two 3.5-week old nestlings in nest. Two adults in area.
Table Mountain	1528	Two adults brooding.
Horseshoe	1538	One adult with one three-week old nestling in nest.
Cliff	1544	All known nests empty. No bald eagles.

Table 12. continued.

Location	Time	Comments
April 6, 2004		
Blue Point	1615	Two six-week old nestlings in nest. Two adults in area.
April 21, 2004		
Horseshoe	0732	Two seven-week old nestlings in nest.
Table Mountain	0736	One adult on nest with one one-week old nestling in nest.
East Verde	0747	Banded two five-week old nestlings in nest. Two adults in area.
Coldwater	1117	One adult brooding one three-week old nestling in nest.
Railroad bridge	1135	No new nests or bald eagles.
Oak Creek	1150	All known nests empty. No bald eagles.
Blue Ridge Reservoir	1326	No new nests or bald eagles.
Knoll Lake nest site	1341	One osprey incubating. Two other empty osprey nests observed.
Bear Canyon	1348	Two ospreys in area.
Woods Canyon nest site	1353	One osprey incubating. Two ospreys on lake.
Willow Springs Lake	1400	One osprey incubating in nest below dam. Two ospreys on lake.
Chevelon nest site	1405	High survey. No new nests or bald eagles.
Blue Point	1448	Two eight-week old nestlings in nest.
Doka	1455	Two fledglings and one adult in area.
Fort McDowell	1457	One eight-week old nestling in nest. One adult in area.
May 3, 2004		
Ive's Wash	0755	One adult on nest with three 8.5-week old nestlings in nest.
Lynx	0849	One eight-week old nestling in nest. Two adults on lake.
Perkinsville	1000	One eight-week old nestling in nest.
Tower	1010	One 8.5-week old nestling in nest.
Railroad bridge	1015	No new nests or bald eagles.
Oak Creek	1030	All known nests empty. No bald eagles.
Ladders	1055	One adult on nest with one 4.5-week old nestling in nest. Second adult in area.
Coldwater	1100	One five-week old nestling in nest. One adult in area.
East Verde	1107	One adult on nest shading two 7.5-week old nestlings in nest. Second adult in area.
Table Mountain	1245	One adult on nest Shading one three-week old nestling in nest.
Horseshoe	1250	One adult on nest with two 8.5-week old nestlings in nest. Second adult in area.
Cliff	1257	All known nests empty. No bald eagles.
Needle Rock	1313	One eight-week old nestling in nest. One adult in area.
Box Bar	1315	Two adults on nest with two 13-week old nestlings in nest.
Fort McDowell	1316	One 11-week-old nestling in nest. One adult in area.
Rodeo	1320	One eight-week old nestling in nest. One adult in area
Orme	1329	Two nine-week old nestlings in nest.
Salt River/Tempe Town Lake	1345	No new nests or bald eagles.
May 4, 2004		
Box Bar	0645	Two fledglings in area.
Bull Dog	0658	Two nine-week old nestlings in nest
Blue Point	0700	Two ten-week old nestlings in nest.
Horse Mesa	0715	All known nests empty. No bald eagles.
Tonto	0722	Two 9.5-week old nestlings in nest.
Sheep	0727	One 6+week old nestling in nest. One adult in area.
76	0733	All known nests empty. No bald eagles.
Roosevelt Lake	0745	One adult at each of the two major inflows.
Pinto	0800	One adult on nest with two eight-week old nestlings in nest. Second adult in area.
Pinal	0804	One 6+week old nestling in nest. One adult in area.
Redmond	0807	One eight-week old nestling in nest. One adult in area.

Table 12. continued.

Location	Time	Comments
May 4, 2004 continued		
Canyon	0820	All known nests empty. No bald eagles.
Cibecue	0950	Addle egg in nest #2. No bald eagles.
Mule Hoof historical BA	1000	All known nests empty. No bald eagles.
Cedar Basin	1019	All known nests empty. No bald eagles.
Lone Pine	1020	One adult shading one four-week-old nestling in nest. Second adult in area.
Pacheta Lake	1052	No new nests or bald eagles.
Reservation Lake	1100	No new nests or bald eagles.
Big Lake	1105	No new nests or bald eagles.
Crescent Lake	1107	One adult incubating in nest #1. Second adult in area.
Lee Valley Reservoir	1113	No new nests or bald eagles.
Sunrise Lake	1116	No new nests or bald eagles.
Horseshoe Cienega Lake	1120	No new nests or bald eagles.
Hawley Lake	1124	No new nests or bald eagles.
Chevelon nest site	1250	No new nests or bald eagles. Potential nest fell.
Willow Springs Lake	1315	One adult perched on the SW end of lake.
Woods Canyon nest site	1320	No new nests or bald eagles.
Bear Canyon Lake	1325	No new nests or bald eagles.
Knoll Lake nest site	1330	No new nests or bald eagles.
East Clear Creek	1345	No new nests or bald eagles.
June 6, 2004		
Rodeo	0630	One adult in area. Nest #2 partially fallen.
Needle Rock	0643	All known nests empty. No bald eagles.
Bartlett	0648	One adult in area.
Horseshoe	0700	All known nests empty. One adult in area.
Table Mountain	0720	All known nests empty. No bald eagles. Failed.
East Verde	0730	One adult in area.
Coldwater	0736	One eight-week old nestling in nest.
Ladders	0740	One nine-week old nestling in nest. One adult in area.
Lynx	0806	All known nests empty. No bald eagles.
Sheep	1045	One adult in area.
Tonto	1053	One adult and fledgling in nest tree.
Roosevelt Lake	1105	Four adults and three subadults on lake.
Pinto	1112	One 13-week old nestling in nest. One adult and fledgling in area.
Pinal	1118	One adult and fledgling in area.
Redmond	1129	All known nests empty. One adult in area.
Lone Pine	1151	One nine-week old nestling in nest. One adult in area.

APPENDIX E: BARTLETT BREEDING AREA SUMMARY

Table 13. Observed human activity and bald eagle behavior, Bartlett BA, Arizona, 2004.

Human Activity	N[1]	W	R	F	L	U	Total	Percent
Small plane	150	50	1	1	--	9	211	69.0
Helicopter	25	36	1	1	--	1	64	20.9
OHV	4	4	3	--	--	--	11	3.6
Canoe/kayak	1	4	--	1	--	2	8	2.6
Rafter	1	1	--	1	--	1	4	1.3
Boater	--	2	--	1	--	--	3	1.0
Jet	1	1	--	--	--	--	2	0.7
Researcher	--	--	--	1	--	--	1	0.3
Agency worker	--	1	--	--	--	--	1	0.3
Docking boat	--	--	--	--	1	--	1	0.3
Total	182	99	5	6	1	13	306	

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

Table 14. Observed forage event and success, Bartlett BA, Arizona, 2004.

Sex	Fish		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	14	6-8	1	1-0	1	0-1	16	7-9
Female	15	10-5	--	--	1	0-1	16	10-6
Total	29	16-13	1	1-0	2	0-2	32	17-15

[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, 2004.

Sex	Fish	Bird	Mammal	Unknown	Total	Percent
Male	56	5	2	6	69	87.3
Female	8	--	2	--	10	12.7
Total	64	5	4	6	79	
Percent	81.0	6.3	5.1	7.6		

Table 16. Bald Eagle Habitat Analysis at the Bartlett BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
31.6a	BO	Left	No	1	RU	UP
31.6b	BO	Left	No	1	RU	UP
33.6	BA	Left	Partial	1	RU	UP
33.8	SH	Right	No	3	PO	MB
34.0	BA	Left	No	1	PO	UP
34.1a	CL	Left	Partial	1	PO	MB
34.1b	SO	Right	Yes	1	RU	WT
34.2a	CM	Left	No	1	PO	MB
34.2b	SB	Island	No	1	PO	WT

[1]River/lake kilometers (Hunt and others 1992).
[2]BO=boulder, BA=cut bank, SH=shrub, CL=cottonwood large/20-30+m, SO=shore, CM=cottonwood medium/10-20m, SB=sandbar.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run, PO =pool.
[5]UP=desert upland, MB=mesquite bosque, WT=willow thicket, CW=cottonwood grove, TA=talus, GB=gravel bar.

Table 16. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
34.2c	SM	Left	No	1	PO	MB
34.2d	CM	Right	Partial	1	PO	CW
34.2e	SB	Island	Partial	1	PO	WT
34.2f	ST	Right	Partial	3	PO	MB
34.3a	CF	Right	Partial	1	RU	CL
34.3b	CF	Right	Partial	1	RU	CL
34.3c	CF	Right	Partial	1	RU	CL
34.3d	CF	Right	Partial	1	RU	CL
34.3e	CF	Right	Partial	1	RU	TA
34.3f	BO	Island	Partial	1	RU	WT
34.3g	SS	Right	No	1	RU	TA
34.3h	SM	Left	No	3	RU	MB
34.3i	SO	Right	No	1	RU	GB
34.4a	CF	Right	Partial	1	RU	CL
34.4b	CF	Right	Partial	1	RU	CL
34.4c	CF	Right	Partial	1	RU	CL
34.4d	CF	Right	Partial	1	RU	CL
34.4e	CF	Right	Partial	1	RU	CL
34.4f	CF	Right	Partial	1	RU	CL
34.4g	CF	Right	Partial	1	RU	CL
34.4h	CT	Right	Partial	1	RU	CL
34.4i	CF	Right	Partial	1	RU	CL
34.4j	CF	Right	Partial	1	RU	CL
34.4k	CF	Right	Partial	1	RU	CL
34.4l	CF	Right	Partial	1	RU	CL
34.5a	CF	Right	Partial	1	PO	CL
34.5b	CT	Right	Partial	1	PO	CL
34.5c	GB	Island	Partial	1	RI	WT
34.5d	CF	Right	Partial	1	RU	CL
34.5e	GR	Channel	Partial	1	BW	WT
34.5f	CF	Right	Partial	1	RU	CL
34.6a	CF	Right	Partial	1	PO	CL
34.6b	CF	Right	Partial	1	PO	CL
34.6c	CT	Right	Partial	1	PO	CL
34.6d	CF	Right	Partial	1	RI	CL
34.6e	CF	Right	Partial	1	PO	CL
34.6f	CF	Right	Partial	1	RU	CL
34.6g	CF	Right	Partial	1	RI	CL
34.7a	CF	Right	Partial	1	RU	CL
34.7b	CF	Right	Partial	1	RU	CL
34.8a	NE	Right	Partial	1	RU	CL
34.8b	CF	Right	Partial	1	RU	CL
34.8c	PT	Right	Partial	1	RU	CL
34.8d	CF	Right	Partial	1	RU	CL

[1]River/lake kilometers (Hunt and others 1992).
[2]SM=snag, CM=cottonwood medium/10-20m, SB=sandbar, mesquite, ST=snag top, CF=cliff ledge, BO=boulder, SS=soft snag, SO=shore, CT=cliff top, GB=gravel bar, GR=ground, NE=nest, PT=pinnacle top.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]PO=pool, RU=run, RI=riffle, BW=backwater.
[5]MB=mesquite bosque, CW=cottonwood grove, WT=willow thicket, CL=cliffs, TA=talus, GB=gravel bar.

Table 16. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
34.8e	SP	Right	No	3	RU	UP
34.8f	CF	Right	Partial	1	RU	CL
34.8g	CF	Right	Partial	1	RU	CL
34.8h	CT	Right	Partial	1	RU	CL
34.8i	CT	Right	Partial	1	RU	CL
34.8j	CT	Right	No	1	RU	UP
34.8k	CF	Right	Partial	1	RU	CL
34.8l	CF	Right	Partial	1	RU	CL
34.8m	CF	Right	Partial	1	PO	CL
34.8n	CF	Right	Partial	1	PO	CL
34.8o	CF	Right	Partial	1	PO	TA
34.8p	CF	Right	Partial	1	RU	CL
34.9a	CT	Right	Partial	1	RU	CL
34.9b	ST	Right	No	3	RU	UP
34.9c	CF	Right	Partial	1	RU	CL
34.9d	SS	Right	No	1	RU	UP
34.9e	CT	Right	Partial	1	RU	CL
34.9f	CT	Right	Partial	1	RU	CL
34.9g	PV	Right	Partial	1	RU	UP
34.9h	SO	Island	Partial	1	PO	WT
34.9i	CF	Right	Partial	1	RU	CL
35.0a	SS	Right	No	1	RI	UP
35.0b	CF	Right	Partial	1	RI	CL
35.0c	PT	Right	Partial	1	RI	CL
35.0d	CF	Right	Partial	1	RU	CL
35.2	CF	Right	Partial	8	RI	CL
35.4a	SM	Right	Partial	1	PO	MB
35.4b	SO	Left	Partial	1	PO	WT
36.0	BO	Left	No	1	RU	UP
36.5	CL	Right	Partial	1	RU	MB
37.1	CF	Left	Partial	6	RU	CL
42.3	BO	Left	No	3	RS	UP
43.9	SM	Left	No	1	RS	UP
49.2	BO	Left	Partial	1	RS	CL
49.6	BO	Left	Partial	1	RS	CL

[1]River/lake kilometers (Hunt and others 1992).
[2]SP=stump or fallen tree, CF=cliff ledge, CT=cliff top, ST=snag top, SS=soft snag, PV=palo verde, SO=shore, PT=pinnacle top, SM=snag, mesquite, BO=boulder, CL=cottonwood large/20-30m.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run, PO =pool, RI=riffle, RS=reservoir.
[5]UP=desert upland, CL=cliffs, TA=talus, WT=willow thicket, MB=mesquite bosque.

Table 17. Bald Eagle Habitat Use at the Bartlett BA, Arizona, 2004.

River km	NX[1, 2]	PP	PH	PW	PX	EX	SX	GN	WB	Total	Percent
31.6	--	--	--	6	--	--	2	--	--	8	--
33.6	--	--	--	6	--	--	--	--	--	6	--
33.8	--	--	--	104	2	--	--	--	--	106	0.2
34.0	--	--	6	4	1	--	--	--	--	11	--
34.1	--	--	--	1	1	--	--	1	--	3	--
34.2	--	114	76	770	425	157	494	16	3	2,055	3.4
34.3	--	119	44	391	54	18	38	1	--	665	1.1
34.4	--	184	110	8,617	48	20	--	--	--	8,979	14.8
34.5	--	50	61	1,686	17	52	302	1	--	2,169	3.6
34.6	--	220	72	2,722	410	36	--	--	--	3,460	5.7
34.7	--	21	3	1,613	9	5	--	--	--	1,651	2.7
34.8 (nest)	35,706	--	--	--	--	--	--	--	3	35,709	58.9
34.8b	--	22	43	3,001	159	12	2	7	1	3,247	5.4
34.9	--	164	168	1,206	5	--	--	--	--	1,543	2.5
35.0	--	42	--	529	4	--	--	--	--	575	0.9
35.2	--	--	--	2	--	--	--	--	--	2	--
35.4	--	28	--	39	3	--	--	7	--	77	0.1
36.0	--	--	--	137	1	--	--	--	--	138	0.2
36.5	--	--	--	39	--	--	--	--	--	39	0.1
37.1	--	--	--	78	65	--	--	--	--	143	0.2
42.3	--	--	--	64	--	--	--	--	--	64	0.1
43.9	--	--	--	3	--	--	--	--	--	3	--
49.2	--	--	--	6	--	--	--	--	--	6	--
49.6	--	--	--	8	--	--	--	--	--	8	--
Total	35,706	964	583	21,032	1,204	300	838	33	7	60,667	
Percent	58.9	1.6	1.0	34.7	2.0	0.5	1.4	0.1	--		

[1]Observation Time (minutes).
[2]NX=nesting activities, PP=perched preening, PH=perched hunting, PW=perched watching, PX=perched various, EX=eating various, SX=shore various, GN=gathering nest material, WB=undetermined behavior.

APPENDIX F: BOX BAR BREEDING AREA SUMMARY

Table 18. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2004.

Human Activity	N[1]	W	R	F	B	U	Total	Percent
Helicopters	2	16	--	--	4	--	22	31.0
Small planes	1	15	--	--	--	--	16	22.5
ATV's	1	6	--	1	2	--	10	14.1
Hikers	--	5	--	1	--	--	6	8.5
Gunfire	--	--	1	--	--	4	5	7.0
Fisherman	3	--	--	--	--	--	3	4.2
4 X 4 vehicles	--	3	--	--	--	--	3	4.2
Picnickers	2	--	--	--	--	--	2	2.8
Motor para-glider	--	2	--	--	--	--	2	2.8
Shooter	--	1	--	--	--	--	1	1.4
Boater	1	--	--	--	--	--	1	1.4
Total	10	48	1	2	6	4	71	

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

Table 19. Observed prey types delivered to the nest, Box Bar BA, Arizona, 2004.

Sex	Fish	Mammals	Birds	Reptiles	Unknown	Total	Percent
Male	19	8	2	3	21	53	58.2
Female	12	10	1	--	15	38	41.8
Total	31	18	3	3	36	91	
Percent	34.1	19.8	3.3	3.3	39.6		

Table 20. Bald eagle habitat analysis at the Box Bar BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]
23.1	SS, GR, PV	Left	No	3	PO
23.9	CT, CF	Left	No	--	RI
24.3	SM, MS	Right	Partial	--	RU
24.4-24.6	SM, MS, BA	Right	Partial	4	RI, RU
24.9 (nest)	CL	Left	Partial	7	--
25.0a	SH	Left	No	7	--
25.0b	CL, MS	Right	Partial	0-6	RU
25.0-25.4	CL, CM	Right	Partial	0-4	RI, RU
25.1	SH	Left	No	5	RU
25.8	SH	Left	No	7	RI
25.9	CL	Right	Partial	5	RI

[1]River Kilometer (Hunt and others 1992).
[2]SS=snag shrub, GR=ground, PV=palo verde, CT=cliff top, CF=cliff ledge, SM=snag mesquite, MS=mesquite, BA=cut bank, CL=cottonwood large/20-30m, SH=hard snag, CM=cottonwood medium/10-20m.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400.
[4]PO=pool, RI=riffle, RU=run.

Table 21. Bald eagle habitat use at the Box Bar BA, Arizona, 2004.

River km	PH[1, 2]	PW	PP	ET	PK	CL	PD	VX	Total	Percent
23.1	2,128	1	46	--	--	--	--	1	2,176	42.0
23.9	484	--	2	--	--	--	--	--	486	9.4
24.3	93	9	-	--	--	--	--	--	102	2.0
24.4-24.6	79	2	--	5	15	6	--	--	107	2.1
25.0a	572	992	96	110	13	13	17	10	1,823	35.1
25.0b	142	--	--	--	--	--	--	1	143	2.8
25.1	18	--	4	18	--	--	--	--	40	0.8
25.8	79	8	--	11	--	--	--	--	98	1.9
25.9	138	61	2	--	9	--	--	2	212	4.1
Total	3,733	1,073	150	144	37	19	17	14	5,187	
Percent	72.0	20.7	2.9	2.8	0.7	0.4	0.3	0.3		

[1]Observation Time (minutes).
[2]PH=perched hunting, PW=perched watching, PP=perched preening, ET=eating in tree, PK=perched with prey, CL=perched close to mate, PD=perched drying, VX=various activities.

APPENDIX G: COOLIDGE BREEDING AREA SUMMARY

Table 22. Observed human activity and bald eagle behavior, Coolidge BA, Arizona, 2004.

Human Activity	None	Watched	Left Area	Not in Area	Unknown	Total	Percent
Driver	10	7	--	4	1	22	45.8
Jet	1	6	1	--	--	8	16.6
Helicopter	--	6	1	--	1	8	16.6
Agency Worker	2	--	--	---	--	2	4.2
Fisherman	1	--	--	1	--	2	4.2
Small Plane	--	2	--	--	--	2	4.2
Woodcutter	--	--	--	1	1	2	4.2
Hunter	1	--	--	--	--	1	2.1
Rancher	1	--	--	--	--	1	2.1
Total	16	21	2	6	3	48	

Table 23. Observed forage event and success, Coolidge BA, Arizona, 2004.

Sex	Fish		Mammals		Birds		Amphibians		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U	E	S-U
Male	7	4-3	--	--	2	0-2	1	1-0	--	--	10	5-5
Female	9	7-2	4	3-1	1	0-1	--	--	2	1-1	16	11-5
Total	16	11-5	4	3-1	3	0-3	1	1-0	2	1-1	26	16-10

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

Table 24. Observed prey types delivered to the nest, Coolidge BA, Arizona, 2004.

Sex	Fish	Amphibians	Mammals	Total	Percent
Male	7	1	1	9	47.4
Female	10	--	--	10	52.6
Total	17	1	1	19	
Percent	89.4	5.3	5.3		

Table 25. Observed prey items delivered to the nest, Coolidge BA, Arizona, 2004.

Sex	Fish			Total	Percent
	Carp	Catfish	Sucker		
Male	3	1	1	5	55.6
Female	3	1	--	4	44.4
Total	6	2	1	9	
Percent	66.7	22.2	11.1		

Table 26. Bald eagle habitat analysis at the Coolidge BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
23.9	ST	Right	No	1	--	UP
24.3a	SH	Left	No	1	RI	UP
24.3b	SH	Left	Partial	1	RI	CW
24.3c	ST	Left	No	1	--	CW
24.3d	ST	Left	Partial	1	--	CW
24.4a	SH	Left	Partial	1	RI	UP
24.4b	ST	Left	Partial	1	RI	UP
24.4c	ST	Right	Partial	1	RU	CW
24.4d	ST	Right	Partial	1	RI	UP
24.4e	SP	Left	Partial	1	RU	MB
24.5a	BO	Left	No	1	RU	UP
24.5b	BO	Right	No	1	RI	UP
24.5c	CL	Left	No	1	RI	CW
24.5d	DM	Right	No	1	RI	UP
24.5e	SO	Right	No	1	RI	--
24.5f	ST	Left	Partial	1	RI	CW
24.5g	ST	Right	No	1	RI	CW
24.5h	ST	Right	No	1	RI	UP
24.6a	BO	Right	Partial	1	RI	--
24.6b	CL	Left	No	1	RB	CW
24.6c	BA	Left	No	2	RI	UP
24.6d	DS	Right	No	1	BW	--
24.6e	SH	Left	Partial	1	RI	CW
24.6f	SO	Left	Partial	1	RI	CW
24.6g	SS	Left	Partial	1	RI	CW
24.6h	ST	Left	No	1	RB	CW
24.6i	ST	Left	Partial	1	RI	CW
24.7a	BO	Channel	No	1	RU	CW
24.7b	BO	Channel	Partial	1	RI	--
24.7c	BO	Right	Partial	1	RI	--
24.7d	BO	Right	Partial	1	RU	--
24.7e	CM	Right	Partial	1	RI	CW
24.7f	CL	Left	Partial	1	PO	CW
24.7g	CL	Left	No	1	RI	CW
24.7h	SS	Left	Partial	1	RI	CW
24.7i	SS	Right	Partial	1	RI	CW
24.7j	ST	Channel	No	1	RI	--
24.7k	ST	Left	No	1	RB	CW
24.7l	ST	Left	No	2	RI	CW
24.7m	SG	Left	Partial	1	RI	CW
24.7n	SP	Channel	No	1	PO	CW
24.7o	SP	Left	No	1	PO	--
24.7p	SP	Right	Partial	1	RI	CW
24.8a	BO	Channel	Partial	1	RU	CW
24.8b	BO	Right	Partial	1	RU	CW
24.8c	DS	Right	No	1	BW	CW
24.8d	SH	Left	Partial	1	RI	CW

[1]River kilometer (Hunt and others 1992).
[2]ST=snag top, SH=hard snag, SP=stump or fallen tree, BO=boulder, CL=cottonwood large/20-30+m, DM=deciduous medium/5-10m, SO=shore, BA=cut bank, DS=deciduous small/0-5m, SS=snag shrub, CM=cottonwood medium/10-20m, 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]RI=riffle, RU=run, RB=river bend, BW=backwater, PO=pool.
[5]UP=desert upland, CW=cottonwood grove, MB=mesquite bosque.

Table 26. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
24.8e	SB	Right	No	1	RI	CL
24.8f	SS	Left	Partial	1	RI	CW
24.8g	SS	Left	Partial	1	RU	CW
24.8h	ST	Channel	No	1	RI	--
24.8i	ST	Channel	Partial	1	RU	--
24.8j	ST	Left	Partial	1	RB	CW
24.8k	ST	Left	Partial	1	RI	CW
24.8l	ST	Left	Partial	1	RU	CW
24.8m	ST	Channel	Partial	1	RU	CW
24.8n	ST	Left	Partial	1	RI	CW
24.8o	ST	Left	Partial	1	RU	CW
24.8p	SP	Channel	No	1	RU	CW
24.9a	BO	Channel	No	1	RI	--
24.9b	BO	Right	No	1	RU	--
24.9c	CL	Left	Partial	3	RU	CW
24.9d	CL	Left	Partial	4	RU	CW
24.9e	BA	Left	No	2	--	UP
24.9f	SO	Left	Partial	1	RU	CW
24.9g	SO	Left	Partial	1	RB	UP
24.9h	SO	Left	No	1	RU	UP
24.9i	SO	Right	No	1	RI	--
24.9j	SO	Right	Partial	1	RU	UP
24.9k	ST	Right	Partial	3	RU	CW
24.9l	ST	Left	No	1	RB	CW
24.9m	SP	Channel	Partial	1	RU	--
25.0a (nest)	NE	Left	Partial	1	RI	CW
25.0b	BO	Right	No	1	PO	SO
25.0c	BO	Right	No	2	PO	SO
25.0d	CM	Left	Partial	1	RI	CW
25.0e	CM	Left	Partial	2	RI	CW
25.0f	CM	Right	Partial	1	RI	CW
25.0g	CM	Right	Partial	3	--	CW
25.0h	CL	Left	Partial	1	RI	CW
25.0i	CL	Left	Partial	2	RI	CW
25.0j	CL	Left	Partial	4	RI	CW
25.0k	CL	Left	No	1	RU	CW
25.0l	SO	Right	No	1	RI	TA
25.0m	SO	Right	No	1	BW	SO
25.0n	SO	Right	No	1	RU	SO
25.0o	SO	Right	No	1	RU	--
25.0p	SG	Right	No	1	RU	SO
25.0q	SG	Right	No	1	RU	TA
25.0r	SP	Channel	No	1	RU	CW
25.0s	SP	Right	No	1	PO	SO
25.0t	SP	Right	No	1	RU	SO
25.1a	BO	Right	Partial	1	RB	UP
25.1b	CF	Left	Partial	1	RB	UP

[1]River kilometer (Hunt and others 1992).
[2]SB=sand bar, SS=snag shrub, ST=snag top, SP=stump or fallen tree, BO=boulder, CL=cottonwood large/20-30+m, BA=cut bank, SO=shore, NE=nest, CM=cottonwood medium/10-20m, SG=soft snag, CF=cliff ledge.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RI=riffle, RU=run, RB=river bend, PO=pool, BW=backwater.
[5]CL=cliffs, CW=cottonwood grove, UP=desert upland, SO=shore, TA=talus.

Table 26. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
25.1c	CF	Right	Partial	1	PO	UP
25.1d	CF	Right	Partial	1	RB	UP
25.1e	CF	Right	Partial	3	RB	UP
25.1f	CM	Right	Partial	3	RB	CW
25.1g	CL	Left	Partial	1	RB	CW
25.1h	CL	Left	Partial	1	RI	CW
25.1i	CL	Left	No	1	RU	CW
25.1j	CL	Right	Partial	1	RB	UP
25.1k	CL	Right	No	2	RB	UP
25.1l	ST	Left	Partial	1	RB	CW
25.1m	ST	Left	Partial	1	RI	CW
25.1n	SP	Channel	Partial	1	RB	--
25.1o	SP	Right	Partial	1	RI	CW
25.1p	SP	Right	Partial	2	--	CW
25.2a	CS	Left	Partial	3	--	CW
25.2b	CM	Left	Partial	2	RI	CW
25.2c	CM	Left	Partial	1	RU	CW
25.2d	CL	Left	Partial	1	RI	CW
25.2e	CL	Left	Partial	4	RI	CW
25.2f	CL	Left	Partial	4	RU	CW
25.2g	CL	Left	Partial	5	RU	CW
25.2h	CL	Left	Partial	3	--	CW
25.2i	CL	Left	No	4	--	CW
25.2j	SO	Right	No	1	RI	CW
25.3a	SG	Left	No	5	PO	CW
25.3b	CM	Left	Partial	4	PO	CW
25.3c	CL	Left	No	4	PO	CW
25.3d	CL	Left	Partial	2	RI	CW
25.3e	CL	Left	Partial	2	RU	CW
25.3f	CL	Left	No	3	--	CW
25.3g	SS	Left	No	4	--	CW
25.3h	ST	Left	No	5	--	CW
25.3i	SS	Left	Partial	3	--	CW
25.4	SS	Left	Partial	4	RU	CW
25.6a	CL	Left	Partial	1	PO	MB
25.6b	CL	Left	Yes	1	RB	MB
26.3a	FP	Left	No	6	--	UP
26.3b	SO	Left	No	6	--	UP
26.6	ST	Left	No	1	--	CW
27.0	ST	Left	Partial	1	RI	MB
27.6	PT	Right	No	2	RI	UP
27.7	PT	Right	No	1	RI	UP

[1]River kilometer (Hunt and others 1992).
[2]CF=cliff ledge, CM=cottonwood medium/10-20m, CL=cottonwood large/20-30+m, ST=snag top, SP=stump or fallen tree, CS=cottonwood small/0-10m, SO=shore, SG=soft snag, SS=snag shrub, FP=fence post, PT=pinnacle top.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]PO=pool, RB=river bend, RI=riffle, RU=run.
[5]UP=desert upland, CW=cottonwood grove, MB=mesquite bosque.

Table 27. Bald eagle habitat use at the Coolidge BA, Arizona, 2004.

River km	NX[1, 2]	PP	PH	PX	DW	EX	SX	BA	WB	Total	Percent
23.9	--	2	22	--	--	--	--	--	--	24	--
24.3	--	--	62	--	--	--	--	--	--	62	0.1
24.4	--	13	51	--	--	--	--	--	--	64	0.1
24.5	--	40	90	53	1	43	1	--	--	228	0.4
24.6	--	83	681	4	5	11	10	--	--	794	1.3
24.7	--	35	368	109	46	53	53	9	--	673	1.1
24.8	--	440	8,786	124	72	45	33	3	2	9,505	15.9
24.9	--	1	41	142	63	--	43	11	--	301	0.5
25.0(nest)	34,634	36	49	69	--	--	--	--	14	34,802	58.0
25.0b	--	224	4,179	230	54	--	9	7	1	4,704	7.8
25.1	--	290	5,143	448	13	4	--	--	1	5,899	9.8
25.2	--	144	769	169	--	8	--	--	2	1,092	1.8
25.3	--	51	666	554	--	12	--	--	--	1,283	2.1
25.4	--	57	45	1	--	--	--	--	--	103	0.2
25.6	--	--	57	2	--	--	--	--	--	59	0.1
26.3	--	--	--	8	--	12	--	--	8	28	0.1
26.7	--	--	14	2	--	--	--	--	--	16	--
27.0	--	--	24	--	--	--	--	--	--	24	--
27.6	--	4	316	2	--	--	--	--	--	322	0.5
Total	34,634	1,420	21,363	1,917	254	188	149	30	28	59,983	
Percent	57.7	2.4	35.6	3.2	0.4	0.3	0.2	0.1	--		

[1]Observation Time (minutes).

[2]NX=nesting activities, PP=perched preening, PH=perched hunting/perched watching, PX=perched various DW=drinking water, EX=eating on shore/eating in tree, SX=standing on shore/standing in water, BA=bathing, WB=undetermined behavior,.

APPENDIX H: CRESCENT BREEDING AREA SUMMARY

Table 28. Observed human activity and bald eagle behavior, Crescent BA, Arizona, 2004.						
Human Activity	None	Watched	Flushed	Left Area	Total	Percent
Fisherman	461	--	2	7	470	89.0
Boats	24	--	--	--	24	4.6
Float Tuber	11	--	--	--	11	2.1
Small Plane	3	7	--	--	10	1.9
Hikers	3	--	2	--	5	.9
Canoe/Kayak	5	--	--	--	5	.9
Construction	2	--	--	--	2	.4
Agency Worker	1	--	--	--	1	.2
Total	510	7	4	7	528	

Table 29. Observed forage event and success, Crescent BA, Arizona, 2004.								
Sex	Fish		Carrion		Reptiles		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	36	27-11	1	1-0	1	1-0	38	29-11
Female	18	15-3	3	3-0	1	1-0	22	19-3
Total	54	42-54	4	4-0	2	2-0	60	48-14

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

Table 30. Observed prey types delivered to the nest, Crescent BA, Arizona, 2004.						
Sex	Fish	Carrion	Reptiles	Mammals	Total	Percent
Male	18	1	1	1	21	61.8
Female	9	3	1	--	13	38.2
Total	27	4	2	1	34	
Percent	79.4	11.8	5.9	2.9		

Table 31. Bald Eagle Habitat Analysis at the Crescent Lake BA, Arizona 2004.					
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	Land Type[4]
1.9	SC	Left	Yes	5	CF
2.0a	SH	Left	No	6	CF
2.0b	PO	Left	Yes	6	CF
2.1a	PO	Left	Yes	4	CF
2.1b	PO	Left	Yes	8	CF
2.15	PO	Left	Yes	5	CF
2.2 (nest)	SH	Left	No	8	CF
2.3	PO	Left	No	8	CF
2.4	SC	Left	No	8	CF
2.5	SC	Left	No	5	CF
2.6	SC	Left	No	5	CF
2.7	PO	Left	No	6	CF

[1]Lake kilometer.
[2]SC=snag conifer, SH=hard snag (only main branches), PO=pine/conifer, old growth/20-30m.
[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 32. Bald eagle habitat use at the Crescent Lake BA, Arizona, 2004.

Lake km	NX[1, 2]	PP	PH	EX	PX	Total	Percent
1.9	--	--	1,610	33	99	1,742	6.9
2.0a	--	10	528	--	--	538	2.1
2.0b	--	26	470	--	30	526	2.1
2.1a	--	365	185	--	--	550	2.2
2.1b	--	--	755	10	--	765	3.0
2.15	--	--	491	--	1	492	1.9
2.2 (nest)	3,795	320	11,532	178	2	15,827	62.4
2.3	--	--	160	--	--	160	.6
2.4	--	--	3,766	--	20	3,786	14.9
2.5	--	--	61	--	--	61	.2
2.6	--	--	836	--	--	836	3.3
2.7	--	--	100	--	--	100	.4
Total	3,795	721	20,494	221	152	25,383	
Percent	15.0	2.8	80.7	.9	.6		

[1]Observation Time (minutes).
[2]NX=nesting activities, PP=perched preening, PH=perched hunting/perched watching, EX=eating in tree/eating in nest, PX=perched various.

APPENDIX I: LADDERS BREEDING AREA SUMMARY

Table 33. Observed human activity and bald eagle behavior, Ladders BA, Arizona, 2004.

Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Canoe/Kayak	35	51	1	2	1	2	1	93	35.6
Small Plane	30	58	--	--	--	1	1	90	34.5
Cattle	26	7	--	--	--	--	1	34	13.0
Helicopter	4	10	2	--	--	1	--	17	6.5
Agency Worker	--	3	1	2	--	--	--	6	2.3
Gunshot	5	--	--	--	--	--	--	5	1.9
Picnicker	1	--	--	--	--	--	1	2	0.8
Boater	2	5	--	--	--	--	1	8	3.0
Hiker	--	1	--	--	--	--	1	2	0.8
Camper	--	1	--	--	--	--	--	1	0.4
OHV	--	--	--	--	--	1	--	1	0.4
Tuber	--	--	--	--	--	--	1	1	0.4
Motor-Parachute	--	1	--	--	--	--	--	1	0.4
Total	103	137	4	4	1	5	7	261	

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

Table 34. Observed forage event and success, Ladders BA, Arizona, 2004.

Sex	Fish		Birds		Mammals		Reptiles		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U	E	S-U
Male	21	15-6	3	1-2	2	0-2	2	1-1	3	0-3	31	17-14
Female	6	3-3	--	--	--	--	--	--	1	0-1	7	3-4
Total	27	18-9	3	1-2	2	0-2	2	1-1	4	0-4	38	20-18

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

Table 35. Observed prey types delivered to the nest, Ladders BA, Arizona, 2004.

Sex	Fish	Birds	Mammals	Reptiles	Unknown	Total	Percent
Male	55	3	--	1	4	63	73.3
Female	20	--	1	--	2	23	26.7
Total	75	3	1	1	6	86	
Percent	87.2	3.4	1.2	1.2	7.0		

Table 36. Observed prey items delivered to the nest, Ladders BA, Arizona, 2004.

Sex	Fish			Reptiles	Total	Percent
	SU[1]	CP	CC	SM		
Male	18	3	1	1	23	65.7
Female	10	2	--	--	12	34.3
Total	28	5	1	1	35	
Percent	80.0	14.3	2.9	2.8		

[1]SU=sucker, CP=carp, CC=channel catfish, SM=Sonoran mud turtle.

Table 37. Bald eagle habitat analysis at the Ladders BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
157.7	SJ	Left	No	2	PO	CL
157.9	CT	Right	No	1	RI	CL
160.4	CF	Left	No	1	RI	CL
160.5	SJ	Right	No	1	RI	CL
160.8	CT	Left	No	2	PO	CL
160.9	CT	Left	No	1	PO	CL
161.3a	SO	Right	No	1	PO	CL
161.3b	WO	Right	No	1	PO	CL
161.3c	JN	Right	Partial	1	RU	CL
161.4a	CF	Right	Partial	2	RU	CL
161.4b	CF	Right	Partial	1	RI	CL
161.4c	CF	Right	Partial	1	RU	CL
161.5	CF	Right	Partial	1	PO	CL
161.6a	CT	Right	Partial	2	PO	CL
161.6b	SO	Left	Partial	1	PO	CL
161.6c	BO	Right	No	1	PO	CL
161.7	SJ	Right	No	2	RU	CL
161.8a	JN	Right	Partial	2	RU	CL
161.8b	JN	Right	Partial	2	RU	CL
161.8c	JN	Right	Yes	2	RU	CL
161.8d	SJ	Right	No	2	RU	CL
161.8e	SJ	Right	Yes	1	RU	CL
161.8f	CF	Right	Partial	2	RU	CL
161.8g	CF	Right	Partial	1	BW	CL
161.8h	CF	Right	Partial	1	BW	CL
161.8i	CF	Right	Yes	1	BW	CL
161.8j	BO	Right	Yes	1	PO	CL
161.9a	JN	Right	Partial	2	BW	UP
161.9b	SJ	Right	Partial	1	BW	CL
161.9c	PO	Right	Partial	1	RU	CL
161.9d	SO	Right	Yes	1	RU	CL
161.9e	JN	Right	No	3	RU	UP
161.9f	SJ	Right	Yes	3	RU	CL
161.9g	CF	Right	Yes	1	RU	CL
161.9h	JN	Right	Yes	2	RU	CL
161.9i	JN	Right	No	2	RU	CL
161.9j	PO	Right	No	2	BW	UP
162.0a	SJ	Right	Yes	2	RU	CL
162.0b	SJ	Right	Yes	2	RU	CL
162.0c	SC	Right	Partial	2	RU	CL
162.0d	CF	Right	Yes	1	RU	CL
162.1a (nest)	CF	Right	Yes	2	RU	CL
162.1b	SJ	Right	No	4	RU	UP
162.2	JN	Right	Partial	1	RI	CL
162.3a	JN	Right	Partial	1	PO	CL
162.3b	SJ	Right	No	2	RU	CL
162.3c	SJ	Right	Yes	3	RU	UP
162.4a	JN	Right	No	2	RU	CL

[1]River kilometer (Hunt and others 1992).
[2]SJ=juniper snag, CT=cliff top, CF=cliff ledge, SO=shore, WO=willow, JN=juniper, BO=boulder, 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]PO=pool, RI=riffle, RU=run, BW=backwater.
[5]CL=cliffs, UP=desert upland.

Table 37. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
162.4b	JN	Right	No	2	RI	MB
162.4c	BO	Left	No	1	RU	CL
162.4d	SB	Right	No	1	RI	UP
162.4e	SO	Left	No	1	PO	WT
162.5a	JN	Right	No	2	PO	CL
162.5b	JN	Right	No	2	RI	CL
162.5c	SJ	Right	No	2	RI	CL
162.5d	JN	Left	No	2	RI	UP
162.5e	JN	Right	Yes	2	RU	UP
162.6a	SO	Left	No	3	PO	UP
162.6b	SO	Right	No	1	PO	UP
162.6c	SJ	Left	No	2	PO	UP
162.6d	JN	Right	No	2	PO	CL
162.6e	JN	Right	No	2	PO	CL
162.6f	JN	Right	No	2	PO	UP
162.7a	JN	Right	No	2	PO	CL
162.7b	SJ	Left	No	8	PO	UP
162.7c	BO	Right	No	1	PO	CL
162.8a	BO	Left	No	1	PO	CL
162.8b	JN	Left	No	3	PO	UP
162.8c	JN	Left	No	4	PO	UP
162.8d	SJ	Left	Yes	1	PO	CL
162.8e	BO	Right	Partial	1	PO	CL
162.8f	CT	Left	No	2	PO	CL
162.8g	CT	Left	No	2	PO	CL
162.8h	CT	Left	No	2	PO	CL
162.8i	CF	Left	No	2	PO	CL
162.8j	CF	Left	Partial	2	PO	CL
162.8k	PT	Left	No	1	PO	CL
162.9a (nest)	CF	Right	No	2	PO	CL
162.9b	CF	Right	No	2	PO	CL
162.9c	CF	Left	Partial	1	PO	CL
162.9d	CF	Left	Partial	2	PO	CL
162.9e	CF	Left	Partial	2	PO	CL
162.9f	CF	Left	Partial	2	PO	CL
162.9g	CF	Left	Partial	2	PO	CL
162.9h	CF	Left	Partial	2	PO	CL
162.9i	CF	Left	Partial	2	PO	CL
162.9j	CF	Left	Yes	2	PO	CL
162.9k	CT	Left	Yes	2	PO	CL
162.9l	CT	Left	No	1	PO	CL
162.9m	CT	Left	No	2	PO	CL
162.9n	CT	Left	No	2	PO	CL
162.9o	CT	Left	No	2	PO	CL
162.9p	CT	Left	No	2	PO	CL
162.9q	CT	Left	No	2	PO	CL

[1]River kilometer (Hunt and others 1992).
[2]BO=boulder, SB=sand bar, SO=shore, JN=juniper, SJ=juniper snag, CT=cliff top, CF=cliff ledge, PT=pinnacle top.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run, RI=riffle, PO=pool.
[5]MB=mesquite bosque, CL=cliffs, UP=desert upland, WT=willow thicket.

Table 37. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
162.9r	CT	Left	No	2	PO	CL
162.9s	CT	Right	No	2	PO	CL
162.9t	CT	Right	No	2	PO	CL
162.9u	SO	Right	Partial	1	PO	UP
162.9v	SO	Left	No	1	PO	CL
162.9w	JN	Left	No	3	PO	UP
162.9x	SB	Left	Partial	1	PO	CL
162.9y	CC	Left	No	2	PO	UP
162.9z	BO	Left	No	1	PO	CL
163.0a	CF	Left	Partial	1	PO	CL
163.0b	CF	Left	Partial	1	PO	CL
163.0c	CF	Left	Partial	1	PO	CL
163.0d	CF	Left	Partial	1	PO	CL
163.0e	CF	Left	Yes	1	PO	CL
163.0f	CF	Right	No	1	PO	CL
163.0g	CF	Right	No	1	PO	CL
163.0h	SO	Left	No	1	PO	CL
163.0i	SO	Left	No	1	PO	WT
163.0j	CT	Right	No	2	PO	CL
163.0k	CT	Right	No	2	PO	CL
163.1a	CT	Left	Partial	1	PO	CL
163.1b	CT	Left	Partial	2	PO	CL
163.1c	CF	Left	Partial	1	PO	CL
163.1d	CF	Left	Partial	1	PO	CL
163.1e	JN	Right	No	3	PO	UP
163.2a	CF	Left	Partial	1	PO	CL
163.2b	CF	Right	No	1	PO	CL
163.2c	CT	Left	Partial	1	PO	CL
163.2d	CT	Left	Partial	1	PO	CL
163.2e	SO	Left	No	1	PO	CL
163.3a	CF	Left	Yes	1	RU	CL
163.3b	CF	Left	Yes	1	PO	CL
163.3c	CT	Left	No	1	RU	CL
163.3d	CT	Left	Partial	1	PO	CL
163.4	CT	Left	No	1	PO	CL
163.5a	JN	Left	No	5	PO	RI
163.5b	CF	Right	No	2	RU	CL
163.5c	CF	Right	No	2	RU	CL
163.5d	CF	Right	No	2	PO	CL
163.5e	CF	Right	Partial	2	PO	CL
163.5f	CT	Right	No	2	PO	CL
163.6a	CF	Right	No	1	PO	CL
163.6b	CF	Right	No	2	PO	CL
163.6c	CF	Right	No	2	PO	CL
163.6d	CF	Right	No	2	PO	CL
163.6e	CF	Right	No	2	PO	CL

[1]River kilometer (Hunt and others 1992).
[2]CT=cliff top, SO=shore, JN=juniper, SB=sand bar, CC=cactus, BO=boulder, CF=cliff ledge.
[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, RU=run.
[5]CL=cliffs, UP=desert upland, WT=willow thicket, RI=ridge.

Table 37. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
163.6f	CF	Right	No	2	RU	CL
163.6g	CT	Right	No	2	PO	CL
163.6h	CT	Right	No	2	PO	CL
163.7a	CT	Right	No	2	PO	CL
163.7b	CF	Right	No	2	PO	CL
163.7c	CF	Right	No	2	PO	CL
163.8a	CT	Right	No	2	PO	CL
163.8b	JN	Left	No	3	PO	UP
163.8c	CF	Left	No	2	PO	CL
163.9a (nest)	CF	Left	Yes	2	PO	CL
163.9b	CF	Left	Yes	2	PO	CL
163.9c	CF	Left	Yes	2	PO	CL
163.9d	CT	Right	No	2	PO	CL
163.9e	CT	Left	No	2	PO	CL
164.0a	CT	Left	Yes	2	PO	CL
164.0b	CF	Left	Yes	2	PO	CL
164.0c	JN	Left	Partial	2	PO	CL
164.0d	JN	Left	Partial	2	PO	CL
164.1	CF	Left	Yes	2	PO	CL

[1]River kilometer (Hunt and others 1992).
[2]CF=cliff ledge, CT=cliff top, JN=juniper.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run, PO=pool.
[5]CL=cliffs, UP=desert upland.

Table 38. Bald eagle habitat use at the Ladders BA, Arizona, 2004.

River km	NX[1]	PP	PH	BA	EX	DW	GN	SX	PX	Total	Percent
157.9	--	--	--	--	--	--	--	--	16	16	--
160.3	--	--	--	--	--	--	--	--	4	4	--
160.4	--	--	--	--	--	--	--	--	5	5	--
160.5	--	--	3	--	--	--	--	--	9	12	--
160.8	--	7	--	--	--	--	--	--	--	7	--
160.9	--	--	9	--	--	--	--	--	--	9	--
161.0	--	--	6	--	--	--	--	--	--	6	--
161.1	--	--	2	--	--	--	--	--	4	6	--
161.2	--	8	58	--	--	--	--	--	3	69	0.1
161.3	--	97	485	--	--	1	--	1	35	619	1.1
161.4	--	52	794	--	--	--	--	--	113	959	1.7
161.5	--	--	186	--	14	1	--	--	2	203	0.4
161.6	--	39	247	--	--	--	--	41	--	327	0.6
161.7	--	112	91	--	--	1	6	9	18	237	0.4
161.8	--	215	1,022	--	4	5	--	--	9	1,255	2.3
161.9	--	161	1,035	--	--	--	--	4	23	1,223	2.2
162.0	--	114	1,334	--	--	--	1	1	113	1,563	2.8
162.1(nest 4)	--	7	69	--	--	--	--	--	--	76	0.1
162.1b	--	37	431	--	4	3	--	--	1	476	0.9
162.2	--	19	557	--	26	1	--	--	10	613	1.1
162.3	--	46	246	--	4	--	--	--	1	297	0.5
162.4	--	52	559	--	4	7	--	5	7	634	1.1
162.5	--	95	403	8	--	10	--	2	2	520	0.9
162.6	--	14	64	--	--	1	1	--	3	83	0.2
162.7	--	--	30	--	4	12	3	9	1	59	0.1
162.8	--	391	1,654	--	9	5	5	--	10	2,074	3.7
162.9(nest 3)	25,568	364	2,888	--	371	--	--	--	1,284	30,475	55.1
162.9b	--	893	4,818	1	13	1	11	8	153	5,885	10.6
163.0	--	310	2,439	20	115	138	11	179	67	3,279	5.9
163.1	--	66	519	--	13	--	2	5	--	605	1.1
163.2	--	26	85	--	--	3	--	4	14	132	0.2
163.3	--	127	105	--	20	2	1	1	2	258	0.5
163.4	--	--	5	--	--	--	--	--	--	5	--
163.5	--	8	577	--	--	--	--	--	--	585	1.0
163.6	--	365	1,406	--	5	--	--	--	1	1,777	3.2
163.7	---	32	288	--	--	--	--	--	--	320	0.6
163.8	--	29	96	--	--	--	--	--	--	125	0.2
163.9(nest 5)	14	37	127	--	31	--	--	--	1	210	0.4
163.9b	--	5	79	--	--	--	--	--	--	84	0.2
164.0	--	37	109	--	--	--	--	--	46	192	0.3
164.1	--	3	22	--	--	--	--	--	--	25	--
164.2	--	--	24	--	--	--	--	--	--	24	--
Total	25,582	3,768	22,872	29	637	191	41	269	1,944	55,333	
Percent	46.2	6.8	41.3	0.1	1.2	0.4	0.1	0.5	3.5		

[1]Observation Time (minutes).

[2]NX=nesting activities, PP=perched preening, PH=perched hunting/perched watching, BA=bathing, EX=eating activities, DW=drinking water GN=gathering material, SX=standing on shore/standing in water, PX=perched various.

APPENDIX J: LUNA BREEDING AREA SUMMARY

Table 39. Observed human activity and bald eagle behavior, Luna BA, Arizona, 2004.						
Human Activity	None	Watched	Restless	Left Area	Total	Percent
Fisherman	443	2	--	8	453	52.4
Boats	211	25	--	--	236	27.3
Float Tube	63	--	--	1	64	7.4
Picnicker	30	--	5	--	35	4.1
Canoe/Kayak	1	--	--	18	19	2.2
Agency Worker	11	--	--	3	14	1.6
Construction	2	6	--	5	13	1.5
Jets	8	1	2	--	11	1.3
Swimmer/Diver	9	--	--	--	9	1.0
Sledding	4	--	--	--	4	0.5
Small Plane	3	--	--	--	3	0.3
Snowmobile	--	--	--	2	2	0.2
Gun Shot	1	--	--	--	1	0.1
Total	786	34	7	37	864	

Table 40. Observed forage event and success, Luna BA, Arizona, 2004.								
Sex	Birds		Fish		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	59	16-43	26	23-3	17	11-6	102	50-52
Female	31	11-20	16	14-2	3	3-0	50	28-22
Total	90	27-63	42	37-5	20	14-6	152	78-72

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

Table 41. Observed prey types delivered to the nest, Luna BA, Arizona, 2004.							
Sex	Fish	Birds	Carrion	Mammals	Unknown	Total	Percent
Male	26	16	11	2	4	59	60.2
Female	12	11	3	1	2	29	29.6
Unknown	--	10	--	--	--	10	10.2
Total	38	37	14	3	6	98	
Percent	38.8	37.8	14.3	3.1	6.1		

Table 42. Observed prey items delivered to the nest, Luna BA, Arizona, 2004.				
Sex	Fish	Birds	Total	Percent
	Rainbow Trout	American Coot		
Male	26	11	37	57.8
Female	12	10	22	34.4
Unknown	--	5	5	7.8
Total	38	26	64	

Table 43. Bald eagle habitat analysis at the Luna BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Distance to H_20[3]	Land Type[4]
0.3	PS	Right	1	RS
0.7	SH	Left	2	RC
0.9	SH	Left	2	RC
1.1	PS	Left	1	RC
1.7	PS	Left	1	RC
1.8	PS	Left	1	RC
2.0	SH	Left	8	CF
2.1	PO	Left	7	CF
2.2	SH	Left	7	CF
2.3 (nest)	NE	Left	7	CF
2.4 (post)	CS	Left	1	RS
2.5	SH	Left	7	CF
2.7	SH	Left	7	CF
2.8	PS	Left	2	RS
3.5	ST	Left	2	RC
5.1 (post)	FP	Right	1	RC

[1]Lake kilometer.
[2]PS=small pine/0-70 ft, SH=hard snag (only main branches), PO=old-growth pine/70-100ft, NE=nest, CS=closure sign, ST=snag top, FP=fencepost.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400.
[4]RS=reservoir main body, RC=reservoir cove, CF=coniferous forest.

Table 44. Bald eagle habitat use at the Luna BA, Arizona, 2004.

Lake km	PP[1, 2]	PH	PR	PW	PV	PK	NX	CL	ET	Total	Percent
0.3	--	186	--	65	1	--	--	--	--	252	0.3
0.7	--	--	--	214	--	--	--	--	--	214	0.3
0.9	60	95	--	1,006	--	--	--	--	15	1,176	1.6
1.1	--	2	--	--	--	--	--	--	27	29	--
1.7	--	9	--	45	--	--	--	--	--	54	0.1
1.8	40	--	--	359	--	--	--	--	--	399	0.5
2.0	--	--	66	2,393	40	--	--	--	--	2,499	3.4
2.1	18	--	32	2,325	12	--	--	--	--	2,387	3.2
2.2	2	9	--	697	--	--	--	2	--	710	1.0
2.3 (nest)	--	--	--	925	4	--	31,337	--	--	32,266	43.3
2.4 (sign)	4	366	--	10	--	--	--	--	--	380	0.5
2.5	467	42	397	28,092	48	6	--	4	29	29,085	39.0
2.7	20	145	395	2,456	--	--	--	--	--	3,016	4.0
2.8	--	96	--	137	--	--	--	--	--	233	0.3
3.5	--	258	--	441	--	--	--	--	--	699	0.9
5.1 (post)	--	52	--	20	--	10	--	--	--	82	0.1
Other[3]	110	182	210	565	--	--	--	8	5	1,080	1.4
Total	721	1,442	1,100	39,750	105	16	31,189	14	76	74,561	
Percent	1.0	1.9	1.5	53.3	0.1	--	42.0	--	0.1		

[1]Observation Time (minutes).
[2]PP=perched preening, PH=perched hunting, PR=perched roosting, PW=perched watching, PV=perched vocalizing, PK=perched with prey, NX=nesting activities, CL=perched close to mate, ET=eating in tree.
[3]Other=secondary perches.

APPENDIX K: ORME BREEDING AREA SUMMARY

Table 45. Observed human activity and bald eagle behavior, Orme BA, Arizona, 2004.

Human Activity	N[1]	W	R	F	L	B	Total	Percent
Helicopter	51	57	--	1	1	4	114	45.2
Driver	13	11	--	4	--	6	34	13.5
Small Plane	8	19	--	1	--	--	28	11.1
Hiker	8	4	1	--	--	3	16	6.3
Water Plant Alarm	16	--	--	--	--	--	16	6.3
Fisherman	9	--	--	--	--	--	9	3.6
Swimmer	4	--	--	1	--	1	6	2.4
Kayak/Canoe	--	1	--	2	--	1	4	1.6
Horseback Rider	3	--	--	--	--	1	4	1.6
Researcher	2	--	--	--	--	2	4	1.6
Birder	1	1	--	1	--	--	3	1.2
Agency Worker	--	--	--	1	1	1	3	1.2
Jet	--	2	--	--	--	--	2	0.8
Gunshots	1	1	--	--	--	--	2	0.8
Picnicker	1	1	--	--	--	--	2	0.8
Logging	2	--	--	--	--	--	2	0.8
Ultralight	--	1	--	--	--	--	1	0.4
Rafter	--	--	--	--	1	--	1	0.4
Woodcutter	--	--	--	--	--	1	1	0.4
Total	119	98	1	11	3	20	252	

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

Table 46. Observed forage event and success, Orme BA, Arizona, 2004.

Sex	Fish		Birds		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	5	3-2	1	1-0	--	--	6	4-2
Female	15	8-7	--	--	12	8-4	27	16-11
Unknown	--	--	--	--	1	1-0	1	1-0
Total	20	11-9	1	1-0	13	9-4	34	21-13

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

Table 47. Observed prey types delivered to the nest, Orme BA, Arizona, 2004.

Sex	Fish	Birds	Unknown	Total	Percent
Male	10	1	4	15	28.3
Female	22	--	16	38	71.7
Total	32	1	20	53	
Percent	60.4	1.9	37.7		

Table 48. Bald eagle habitat analysis at the Orme BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
0.3v[6]	CM	Left	Yes	1	RU/RI	MB
0.4v	WI/ST	Left	No	1	RU/RI	MB
1.1v	SM	Left	No	1	RU	MB
4.2v	CM/ST	Right	Partial	2	RU	MB
4.4s	CM/SG	Left	No	4	RU	CW/MB
4.6s	SM	Left	No	1	RI	UP/TX
5.2a,s (Nest)	CL	Right	Partial	6	RB	CW/TX
5.2bs	SH	Right	No	6	RB	CW
5.3s	SH	Right	No	6	RB	CW
10.8s	CL/ST	Right	No	2	BW/RI	UP

[1]River kilometer (Hunt and others 1992).
[2]CM=cottonwood medium/10-20m, WI=willow, ST=snag top, SM=snag mesquite, SG= soft snag, CL=cottonwood large/20-30+m, SH=hard snag.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400.
[4]RU=run, RI=riffle, RB=river bend, BW=backwater
[5]MB=mesquite bosque, CW=cottonwood grove, UP=desert upland, TX=tamarisk thicket.
[6]v=Verde River, s=Salt River.

Table 49. Bald eagle habitat use at the Orme BA, Arizona, 2004.

River km	PP[1, 2]	PW	PV	PK	PU	ET	CL	NX	Total	Percent
0.3v[3]	82	3,798	1	--	--	5	366	--	4,252	12.6
0.4v	24	965	1	--	--	--	1	--	991	2.9
1.1v	52	795	--	--	--	--	3	--	850	2.5
4.2v	30	595	--	--	19	--	--	--	644	1.9
4.4s	4	138	--	--	1	--	2	--	145	0.4
4.6s	54	382	--	--	1	--	--	--	437	1.3
5.2s (nest)	28	236	1	--	--	--	--	14,622	14,887	44.0
5.3s	1,374	9,632	64	47	19	31	340	5	11,512	34.0
10.8s	--	7	--	--	115	--	--	--	122	0.4
Total	1,648	16,548	67	47	155	36	712	14,622	33,840	
Percent	4.9	48.9	0.2	0.1	0.5	0.1	2.1	43.2		

[1]Observation Time (minutes).
[2]PP=perched preening, PW=perched watching/hunting, PV=perched vocalizing, PK=perched with prey, PU=perched unknown, ET=eating in tree, CL=perched very close to mate, NX=nest duties.
[3]v=Verde River, s=Salt River.

APPENDIX L: PINTO BREEDING AREA SUMMARY

Table 50. Observed human activity and bald eagle behavior, Pinto BA, Arizona, 2004.

Human Activity	None	Watched	Flushed	Unknown	Total	Percent
Rafter	2	2	--	1	5	31.3
Helicopter	1	2	1	--	4	25.0
Fisherman	--	3	--	--	3	18.8
Driver	--	1	1	--	2	12.5
People/Unknown	--	1	-	--	1	6.2
Canoe	1	--	--	--	1	6.2
Total	4	9	2	1	16	

Table 51. Bald Eagle Habitat Analysis at the Pinto BA, Arizona 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
101.6	CT	Right	No	1	--	CL
101.9	CT	Right	No	1	RU	CL
102.3	CT	Right	No	1	RU	CL
102.9	CT	Right	No	1	RU	CL
103.1a	CT	Right	No	1	RU	CL
103.1b	SP	Left	No	1	RU	--
103.9	CL	Right	No	2	--	TX
104.2	CM	Right	Partial	1	RU	CW
104.3a (nest)	NE	Right	Partial	1	RI	CW
104.3b	CM	Right	No	1	RI	CW
104.3c	CM	Right	Partial	1	RI	CW
104.3d	CM	Right	No	3	--	CW
104.3e	CS	Right	Yes	1	RI	CW
104.4a	CM	Right	No	1	RU	CW
104.4b	CM	Right	No	1	RU	CW
105.0	TX	Left	No	1	RU	TX
105.5	CT	Left	No	1	RU	CL

[1]River kilometer (Hunt and others 1992).
[2]CT=cliff top, SP=stump or fallen tree, CL=cottonwood large/20-30+m, CM=cottonwood medium/10-20m, NE=nest, CS=cottonwood small/0-10m, TX=tamarisk thicket.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>401m.
[4]RU=run, RI=riffle.
[5]CL=cliffs, TX=tamarisk thicket, CW=cottonwood grove.

Table 52. Bald eagle habitat use at the Pinto BA, Arizona, 2004.

River km	PW[1, 2]	PP	PV	PR	PU	Total	Percent
102.2	570	--	--	--	--	570	2.8
103.1	1,135	5	--	--	--	1,140	5.5
104.3a	10,516	985	38	6	--	11,545	56.2
104.3b	2,642	41	5	--	1	2,689	13.1
104.3c	4,300	289	14	--	--	4,603	22.4
Total	19,163	1,320	57	6	1	20,547	
Percent	93.3	6.4	0.3	--	--		

[1]Observation Time (minutes).
[2]PW=perched watching, PP=perched preening, PV=perched vocalizing, PR=perched roosting, PU=perched Unknown.

APPENDIX M: PLEASANT BREEDING AREA SUMMARY

Table 53. Observed human activity and bald eagle behavior, Pleasant BA, Arizona, 2004.

Human Activity	None	Watched	Flushed	Not in Area	Total	Percent
Boat	24	9	3	2	38	33.0
Small Plane	14	12	--	--	26	22.6
Helicopter	6	5	2	3	16	13.9
Fisherman	13	1	1	--	15	13.0
Jet	3	7	--	--	10	8.7
OHV	4	1	--	--	5	4.3
Jet Ski	1	--	2	--	3	2.6
Ultra Light	1	--	--	--	1	0.9
Water Skier	--	1	--	--	1	0.9
Total	66	36	8	5	115	

Table 54. Watercraft compliance at the southern closure boundary, Pleasant BA, Arizona, 2004.

Date	Boats at Closure	Boats in Closure	Jet Skis at Closure	Jet Skies in Closure	Total
2/6-15	45	4	1	--	50
2/20-29	51	5	--	1	57
3/5-14	306	11	39	--	356
3/19-28	314	11	36	2	363
4/2-11	178	9	30	--	217
4/16-25	133	4	22	--	159
4/30-5/7	217	10	15	--	242
5/11-12	36	--	2	--	38
Total	1280	54	145	3	1482
Percent	86.4	3.6	9.8	0.2	

Table 55. Watercraft compliance: weekend vs. weekday, Pleasant BA, Arizona, 2004.

Date	Boats at Closure	Boats in Closure	Jet Skis at Closure	Jet Skies in Closure	Total	Percent
Weekend	1060	43	120	2	1227	82.8
Weekday	220	11	25	1	257	17.3
Total	1280	54	145	3	1482	

Table 56. Observed forage event and success, Pleasant BA, Arizona, 2004.

Sex	Fish		Birds		Reptiles		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	5	5-0	--	--	1	1-0	6	6-0
Female	2	2-0	1	1-0	--	--	3	3-0
Both	1	0-1	--	--	--	--	1	0-1
Unknown	1	0-1	1	1-0	--	--	2	1-1
Total	9	7-2	2	2-0	1	1-0	12	10-2

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

Table 57. Observed prey types delivered to the nest, Pleasant BA, Arizona, 2004.

Sex	Fish	Birds	Reptiles	Unknown	Total	Percent
Male	10	1	1	14	26	44.8
Female	2	--	--	16	18	31.0
Unknown	1	1	--	12	14	24.1
Total	13	2	1	42	58	
Percent	22.4	3.4	1.7	72.4		

Table 58. Bald eagle habitat analysis at the Pleasant BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]
68.7a	CF	Right	Yes	1	RC
68.7b	SO	Left	No	1	RC
68.8a	CF	Left	No	1	RC
68.8b	CT	Left	No	1	RC
68.9a	CF	Right	No	1	RC
68.9b	CT	Left	No	1	RC
69.0a	NS	Left	Yes	1	RC
69.0b	CF	Left	No	1	RC
69.0c	CT	Left	No	1	RC
69.0d	CT	Left	No	1	RC
69.1a	BO	Left	Yes	1	RC
69.1b	CF	Left	Yes	1	RC
69.1c	CT	Left	No	1	RC
69.2a	BO	Left	Yes	1	RC
69.2b	CT	Left	No	1	RC
69.2c	CF	Left	Yes	1	RC
69.3	CT	Left	Yes	1	RC

[1]River kilometer (Hunt and others 1992).
[2]CF=cliff ledge, SO=shore, CT=cliff top, NS=nest, BO=boulder.
[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=river cove.

Table 59. Bald eagle habitat use at the Pleasant BA, Arizona, 2004.

River km	PP[1, 2]	PH	PK	PV	EC	SS	DW	WB	CL	NX	Total	Percent
68.7a	--	96	--	--	--	--	--	--	--	--	96	0.3
68.7b	--	--	--	--	--	317	75	11	58	-	461	1.4
68.8a	--	132	--	--	2	--	--	--	--	--	134	0.4
68.8b	1,180	590	9	3	17	--	--	--	--	--	1,799	5.6
68.9a	--	19	--	--	--	--	--	--	--	--	19	0.1
68.9b	464	6,215	--	57	8	--	--	--	71	--	6,815	21.2
69.0a	--	--	--	--	--	--	--	--	--	20,413	20,413	63.6
69.0b	5	92	--	2	--	--	--	--	32	--	131	0.4
69.0c	--	8	--	--	--	--	--	--	--	--	8	--
69.0d	--	7	--	--	--	--	--	--	--	--	7	--
69.1a	--	60	--	--	--	--	--	--	--	--	60	0.2
69.1b	--	10	--	--	18	--	--	--	--	--	28	0.1
69.1c	213	1,236	--	1	--	--	--	--	9	--	1,459	4.5
69.2a	5	--	16	2	--	3	2	20	--	--	48	0.1
69.2b	35	309	--	--	--	--	--	--	--	--	344	1.1
69.2c	--	189	--	--	--	--	--	--	--	--	189	0.6
69.3	40	5	--	5	--	10	--	--	--	--	60	0.2
Total	1,942	8,968	25	70	45	330	77	31	170	20,413	32,071	
Percent	6.1	28.0	0.1	0.2	0.1	1.0	0.2	0.1	0.5	63.6		

[1]Observation Time (minutes).

[2]PP=perched preening, PH=perched hunting/watching, PK=perched with prey, PV=perched vocalizing, EC=eating on cliff, SS=standing on shore, DW=drinking water, WB=undetermined behavior, CL=perched close to mate, NX=nesting activities.

APPENDIX N: SAN CARLOS BREEDING AREA SUMMARY

Table 60. Observed human activity and bald eagle behavior, San Carlos BA, Arizona, 2004.

Human Activity	N[1]	W	R	F	L	B	Total	Percent
Driver	214	6	1	--	--	--	221	45.0
Hiker	94	6	--	4	1	--	105	21.4
OHV	49	10	1	--	--	1	61	12.4
Gunshot	14	3	--	--	--	--	17	3.5
Woodcutter	7	5	1	--	--	--	13	2.6
Power company	9	2	--	--	--	--	11	2.2
Horseback rider	8	1	--	--	--	--	9	1.8
Hunter	7	1	--	--	--	--	8	1.6
Bicycler	6	--	--	--	--	1	7	1.4
Picnicker	5	--	--	--	--	--	5	1.0
Small plane	4	1	--	--	--	--	5	1.0
Jet	--	1	4	--	--	--	5	1.0
Swimmer	3	1	--	--	--	--	4	0.8
Researcher	1	2	--	1	--	--	4	0.8
Singing	4	--	--	--	--	--	4	0.8
Cattle	1	2	--	--	--	--	3	0.6
Camper	2	--	--	--	--	--	2	0.4
Construction	--	2	--	--	--	--	2	0.4
Birder	1	--	--	--	--	--	1	0.2
Shooter	1	--	--	--	--	--	1	0.2
Ultra light	--	--	1	--	--	--	1	0.2
Helicopter	--	--	1	--	--	--	1	0.2
Rancher	1	--	--	--	--	--	1	0.2
Total	431	43	9	5	1	2	491	

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

Table 61. Observed forage event and success, San Carlos BA, Arizona, 2004.

Sex	Fish		Mammals		Carrion		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	1	1-0	2	1-1	2	2-0	5	4-1
Female	2	2-0	--	--	--	--	2	2-0
Unknown	--	--	1	1-0	--	--	1	1-0
Total	3	3-0	3	2-1	2	2-0	8	7-1

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

Table 62. Observed prey types delivered to the nest, San Carlos BA, Arizona, 2004.

Sex	Fish	Birds	Carrion	Unknown	Total	Percent
Male	16	7	2	12	37	66.1
Female	11	1	--	3	15	26.8
Unknown	2	1	--	1	4	7.1
Total	29	9	2	16	56	
Percent	51.8	16.1	3.6	28.6		

Table 63. Observed prey items delivered to the nest, San Carlos BA, Arizona, 2004.

Sex	Fish					Birds	Total	Percent
	SU	BC	CS	LB	GF	AC		
Male	1	--	1	1	1	3	7	58.3
Female	2	1	1	--	--	--	4	33.3
Unknown	--	1	--	--	--	--	1	8.3
Total	3	2	2	1	1	3	12	

[1]SU=sucker, BC=black crappie, CS=carp, LB=largemouth bass, GF=goldfish, AC=American coot.

Table 64. Bald eagle habitat analysis at the San Carlos BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
9.5	SO	Left	No	8	--	--
10.8	DM	Right	Yes	1	RU	--
11.0a	DL	Right	No	1	--	CW
11.0b	DM	Left	No	1	RU	--
11.0c	CF	Right	No	8	RU	FL
11.1	DL	Right	No	1	--	CW
11.2	TP	Right	No	8	RU	FL
11.4a	CL	Right	No	4	RU	--
11.4b	TP	Right	No	8	PN	FL
11.5	TP	Right	No	8	PN	FL
11.6a	DL	Right	No	1	--	--
11.6b	GR	Right	No	8	RU	FL
11.8	CL	Right	Yes	1	RU	--
12.8	DL	Right	Partial	1	RU	--
14.5	DM	Right	No	1	RU	--
L12.0	SO	--	No	3	RC	TX
L12.7	CF	--	Partial	3	RS	UP
L13.5	CF	Left	No	2	RC	--
L20	BA	Right	No	7	RC	--

[1]River kilometer (Hunt and others 1992), L=lake.
[2]SO=shore, DM=deciduous medium/5-10m, DL=deciduous large/10-20+m., CF=cliff face, TP=telephone pole, CL=cottonwood large/20-30+m, GR=ground, BA=bank cut.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400.
[4]RU=run, PN=pond, RC=reservoir cove, RS=reservoir main body.
[5]CW=cottonwood grove, FL=farmland, TX=tamarisk thicket, UP=desert upland.

Table 65. Bald eagle habitat use at the San Carlos BA, Arizona, 2004.

River km	NX[1,2]	PW	PR	PP	PH	CL	PX	EG	Total	Percent
9.5	--	--	--	--	--	--	--	9	9	--
10.2	--	--	--	10	--	--	5	--	15	--
11	--	2,904	1,956	164	--	--	190	--	5,214	12.6
11.1	25,318	7,017	291	232	--	6	368	--	33,232	80.6
11.2	--	25	--	--	--	--	--	--	25	0.1
11.3	--	--	--	--	--	--	3	--	3	--
11.4	--	1,130	358	170	20	98	89	--	1,865	4.5
11.5	--	204	--	--	4	--	73	--	281	0.7
11.6	--	69	--	--	3	--	6	--	78	0.2
11.8	--	191	--	--	--	--	--	--	191	0.5
12.8	--	--	--	--	--	--	5	--	5	--
14.5	--	--	--	--	23	--	--	--	23	0.1
L12.0[3]	--	--	--	--	--	--	--	15	15	--
L12.7	--	--	--	--	--	--	27	--	27	0.1
L13.5	--	240	--	--	--	--	--	--	240	0.6
L20	--	--	13	--	--	--	--	--	13	--
Total	25,318	11,780	2,618	576	50	104	766	24	41,236	
Percent	61.4	28.6	6.3	1.4	0.1	0.3	1.9	0.1		

[1]Observation Time (minutes).

[2]NX=nesting activities, PW=perched watching, PR=perched roosting, PP=perched preening, PH=perched hunting, CL=perched close to mate, PX=perched various, EG=eating on ground.

[3]L=lake.

APPENDIX O: TONTO BREEDING AREA SUMMARY

Table 66. Observed human activity and bald eagle behavior, Tonto BA, Arizona, 2004.

Human Activity	None	Watched	Flushed	Left Area	Unknown	Total	Percent
Helicopter	6	6	--	--	--	12	30.8
Small Plane	4	5	--	--	--	9	23.1
Gunshot	6	1	--	--	1	8	20.5
Dog	3	1	--	--	--	4	10.3
Agency Worker	--	--	1	1	--	2	2.6
Cattle	2	--	--	--	--	2	2.6
ATV	1	--	--	--	--	1	5.1
Hiker	1	--	--	--	--	1	5.1
Total	23	13	1	1	1	39	
Percent	59.0	33.3	2.6	2.6	2.6		

Table 67. Observed prey types delivered to the nest, Tonto BA, Arizona, 2004.

Sex	Fish	Mammals	Birds	Carrion	Reptiles	Unknown	Total	Percent
Male	39	2	--	--	--	13	54	50.9
Female	35	3	3	1	1	9	52	49.1
Total	74	5	3	1	1	22	106	
Percent	69.8	4.7	2.8	0.9	0.9	20.8		

Table 68. Bald eagle habitat analysis at the Tonto BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]
16.1	CL	Right	Yes	8	IF/RU
16.2	CL	Right	No	8	IF
16.3	CM	Right	No	5	PO
16.4a	CM	Right	Partial	8	IF
16.4b	CM	Right	Partial	4	PO
16.5	SS	Left	Yes	1	PO
16.6	CL	Right	No	4	PO
16.7a (nest)	CL	Left	Partial	8	IF
16.7b	CL	Left	Partial	5	PO
16.8a	CM	Left	Partial	8	IF
16.8b	CM	Left	Partial	5	PO
16.9a	CL	Left	Partial	5	PO
16.9b	SH	Left	No	1	PO
17.3	CL	Right	Partial	3	RU

[1]River kilometer (Hunt and others 1992).
[2]CL=cottonwood large/20-30+m, CM=cottonwood medium/10-20m, SS=snag shrub, 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=>400.
[4]IF=inflow to reservoir, RU=river run, PO=pool.

Table 69. Bald eagle habitat use at the Tonto BA, Arizona, 2004.

River km	PW[1, 2]	PP	PH	ET	SH	GN	NX	Total	Percent
16.1	31	13	--	--	--	--	--	44	0.1
16.2	11	--	--	--	--	--	--	11	--
16.3	29	--	--	--	--	1	--	30	0.1
16.4	36	--	2	--	119	1	--	158	0.5
16.5	24	21	--	--	120	9	--	174	0.5
16.6	95	--	--	--	--	2	--	97	0.3
16.7	14,504	1,100	--	--	9	6	15,680	31,299	97.2
16.8	294	25	--	17	--	--	--	336	1.0
16.9	14	--	--	--	--	--	--	14	--
17.3	--	--	30	--	--	--	--	30	0.1
Total	15,038	1,159	32	17	248	19	15,680	32,193	
Percent	46.7	3.6	0.1	0.1	0.8	0.1	48.7		

[1]Observation Time (minutes).
[2]PW=perched watching, PP=perched preening, PH=perched hunting, ET=eating in tree, SH=standing in water/bathing, GN=gathering nest material, NX=nesting activity.

APPENDIX P: TOWER BREEDING AREA SUMMARY

Table 70. Observed human activity and bald eagle behavior, Tower BA, Arizona, 2004.

Human Activity	N[1]	W	F	L	B	U	Total	Percent
Train	1	20	8	--	--	--	29	26.9
Small Plane	8	15	1	--	1	--	25	23.1
Helicopter	2	8	--	--	1	1	12	11.1
Driver	6	--	--	--	5	--	11	10.2
Hiker	5	--	--	--	3	--	8	7.4
Camper	3	--	--	--	2	--	5	4.6
Agency Worker	2	--	--	--	2	--	4	3.7
Rafter	--	--	3	--	--	--	3	2.8
Researcher	1	--	1	--	1	--	3	2.8
OHV	--	1	1	--	--	--	2	1.9
Canoe/Kayak	1	--	--	--	--	--	1	0.9
Fisherman	--	--	--	--	1	--	1	0.9
Gunshot	--	--	--	--	--	1	1	0.9
Potographer	1	--	--	--	--	--	1	0.9
Rancher	--	1	--	--	--	--	1	0.9
Shooter	--	--	--	1	--	--	1	0.9
Total	30	45	14	1	16	1	108	

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

Table 71. Observed forage event and success, Tower BA, Arizona, 2004

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

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

Table 72. Observed prey types delivered to the nest, Tower BA, Arizona, 2004.

Sex	Fish	Birds	Mammals	Unknown	Total	Percent
Male	6	1	--	2	9	34.6
Female	12	--	1	2	15	57.7
Unknown	--	1	--	1	2	7.7
Total	18	2	1	5	26	
Percent	69.2	7.7	3.8	19.2		

Table 73. Bald eagle habitat analysis at the Tower BA, Arizona, 2004.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
236.5	CL	Right	No	1	PO	CW
238.6	CL	Left	No	1	PO	CW
239.8	SJ	Right	No	3	PO	UP
242.1	CT	Right	No	1	PO	CL
247.0	CF	Left	Partial	2	RI	CL
247.1	PP	Left	No	3	RI	UP
247.2a	CT	Left	Partial	2	PO	CL
247.2b	SJ	Right	No	2	PO	CL
247.3	CT	Left	Partial	2	PO	CL
247.4a	SJ	Right	No	2	PO	CL
247.4b	CF	Right	Partial	2	PO	CL
247.5	SJ	Right	No	5	PO	UP
247.7a	SJ	Right	Partial	2	PO	CL
247.7b	CT	Right	No	2	PO	CL
247.8a	SJ	Left	No	3	PO	CL
247.8b	CT	Right	Partial	2	PO	CL
248.0	CT	Right	Partial	2	RU	CL
248.1a	CT	Left	Partial	2	RU	CL
248.1b	SJ	Right	No	2	RU	CL
248.1c	CT	Right	Partial	2	RU	CL
248.1d	SJ	Right	Partial	2	RU	TA
248.2a	NE	Left	Partial	2	RU	CL
248.2b	CT	Left	Partial	2	RU	CL
248.2c	SJ	Right	No	2	RU	CL
248.2d	CT	Right	Partial	2	RU	CL
248.2e	SH	Right	No	1	RU	CW
248.2f	BO	Right	No	2	RU	UP
248.2g	SO	Right	Partial	1	RU	CW
248.2h	CM	Right	Partial	1	RU	CW
248.3a	SH	Left	Partial	1	RU	TA
248.3b	SJ	Left	Partial	1	RU	TA
248.3c	JN	Right	No	2	RU	CL
248.3d	CT	Right	Partial	2	RU	CL
248.3e	SP	Right	No	2	RU	CL
248.3f	PP	Right	No	3	RU	UP
248.4a	SJ	Left	Partial	1	RU	TA
248.4b	SJ	Right	No	2	RU	CL
248.4c	CF	Right	Partial	2	RU	CL
248.5a	CT	Right	Partial	2	RU	CL
248.5b	NE	Right	Partial	2	RU	CL
248.5c	BO	Right	Partial	1	RU	TA
248.6	CT	Right	Partial	2	RI	CL
248.7	CF	Left	Partial	2	RI	CL
250.8a	SJ	Left	Partial	3	PO	TA
250.8b	SJ	Left	Partial	1	PO	TA
250.8c	CF	Left	Partial	2	PO	CW
251.0	CF	Right	Partial	2	RI	CL
251.2a	SG	Left	Partial	1	RI	CW

[1]River kilometer (Hunt and others 1992).
[2]CL=cliffs, SJ=juniper snag, CT=cliff top, CF=cliff ledge, PP=power pole, NE=nest, SH=hard snag, BO=boulder, SO=shore, CM=cottonwood medium/10-20m, JN=juniper tree, SP=stump, 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=>4001m.
[4]PO=pool, RI=riffle, RU=run.
[5]CW=cottonwood grove, UP=desert upland, CL=cliff, TA=talus.

Table 73. continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
251.2b	SH	Left	No	2	RI	CW
251.7	SG	Left	Partial	1	RI	CW

[1]River kilometer (Hunt and others 1992).
[2]SH=hard snag, 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=>4001m.
[4]RI=riffle.
[5]CW=cottonwood grove.

Table 74. Bald eagle habitat use at the Tower BA, Arizona, 2004.

River km	PW[1, 2]	PP	PD	PL	PR	PV	SX	GN	NX	Total	Percent
236.5	2	--	--	--	--	--	--	--	--	2	--
237.0	4	--	--	--	--	--	--	--	--	4	--
238.6	10	--	--	--	--	--	--	--	--	10	--
239.1	--	--	--	--	--	--	3	--	--	3	--
239.8	445	--	--	--	--	--	--	--	--	445	1.2
247.0	45	--	--	--	--	--	--	--	--	45	0.1
247.1	604	30	--	--	58	2	--	--	--	694	1.9
247.2	33	--	--	--	--	1	--	--	--	34	0.1
247.3	105	--	--	--	--	--	--	--	--	105	0.3
247.4	10	--	--	--	--	--	--	--	--	10	--
247.5	30	--	--	--	--	--	--	2	--	32	0.1
247.6	6	--	--	--	--	--	--	--	--	6	--
247.7	27	34	--	--	--	--	--	--	--	61	0.2
247.8	219	--	--	--	--	--	--	--	--	219	0.6
248.0	337	--	--	--	--	--	29	1	--	367	1.0
248.1	4,675	1,402	96	69	234	1	13	19	--	6,509	17.5
248.2	2,408	429	105	33	250	10	381	25	21,248	24,889	67.0
248.3	1,490	264	131	1	6	--	8	3	--	1,903	5.1
248.4	620	62	--	--	35	--	--	--	--	717	1.9
248.5	181	43	4	--	--	--	--	3	--	231	0.6
248.6	296	--	--	--	--	--	--	--	--	296	0.8
248.7	3	--	--	--	--	--	--	--	--	3	--
250.8	521	--	--	25	--	--	--	--	--	546	1.5
251.0	7	--	--	--	--	--	--	--	--	7	--
251.2	3	--	--	--	--	--	--	--	--	3	--
251.7	33	--	--	--	--	--	--	--	--	33	0.1
Total	12,114	2,264	336	128	583	14	434	53	21,248	37,174	
Percent	32.6	6.1	0.9	0.3	1.6	--	1.2	0.1	57.2		

[1]Observation Time (minutes).
[2]PW=perched watching/hunting, PP=perched preening, PD=perched drying wings, PL=perched close to mate, PR=perched roosting, PV=perched vocalizing, SX=various activities on shore, GN=gathering nest material, NX=nesting activities.