ARIZONA BALD EAGLE MANAGEMENT PROGRAM
2011 SUMMARY REPORT

Kyle M. McCarty, Bald Eagle Field Projects Coordinator
Kenneth V. Jacobson, Eagle Management Coordinator
Nongame Branch, Wildlife Management Division

Photo by Greg Joder

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Branch Chief: Eric Gardner
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086

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ARIZONA BALD EAGLE MANAGEMENT PROGRAM 2011 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 5 others (USFWS 1982). In Alaska, the USFWS did not list the species and it does not occur in Hawaii. The USFWS downlisted the bald eagle to threatened in 1995 and delisted the species in 2007 (USFWS 1995, 2007). In August 2006, the USFWS denied a petition to recognize bald eagles breeding in the Sonoran Desert of central Arizona as a Distinct Population Segment (DPS). As a result of a lawsuit challenging this decision, the U.S. District Court for the District of Arizona issued a ruling in March 2008 ordering the USFWS to conduct a status review to determine if listing the population as a DPS was warranted, and if so then to decide if listing the DPS as threatened or endangered under the ESA was warranted (USFWS 2008). Following the court order, USFWS designated bald eagles in central Arizona as a threatened DPS while the status review was undertaken (USFWS 2008). In February 2010, the USFWS determined that the Sonoran Desert Area population did not satisfy the definition of a DPS and was therefore not eligible for listing (USFWS 2010), and in October 2010 the Court lifted its injunction against USFWS. On September 2, 2011, the USFWS removed bald eagles in the Sonoran Desert Area from the list of endangered and threatened species (USFWS 2011).

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

To enhance coordination, increase communication, and provide oversight for Arizona bald eagle management, land and wildlife management agencies formed the Southwestern Bald Eagle Management Committee (SWBEMC) in 1984. Today, the members include: Arizona Game and Fish Department (AGFD), Arizona Department of Transportation, Arizona Public Service (APS), Arizona State Parks Department, American Eagle Research Institute, Arizona Army National Guard, Fort McDowell Yavapai Nation (FMYN), Geo-Marine (U.S. Air Combat Command), Gila River Indian Community, The Hopi Tribe, Maricopa County Parks and Recreation Department (MCPRD), Freeport McMoRan, Navajo Nation Fish and Wildlife, Salt River Pima-Maricopa Indian Community (SRPMIC), Salt River Project (SRP), San Carlos Apache Tribe (SCAT), Tonto Apache Tribe, U.S. Army Corps of Engineers (ACE), U.S. Bureau of Indian Affairs, U.S. Bureau of Land Management, U.S. Bureau of Reclamation (USBR), U.S. Department of Defense (Luke Air Force Base), U.S. Forest Service (USFS), USFWS, U.S. National Park Service, and White Mountain Apache Tribe. In 2007, some members of the SWBEMC signed the Conservation Assessment and Strategy for Bald Eagles in Arizona (CAS), which describes bald eagle management in the state and outlines the strategy for continuing

management (Driscoll et al. 2006). The CAS also specifies current threats facing bald eagles in Arizona and identifies management actions necessary to maintain their distribution and abundance in the state following delisting.

STUDY AREA

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

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

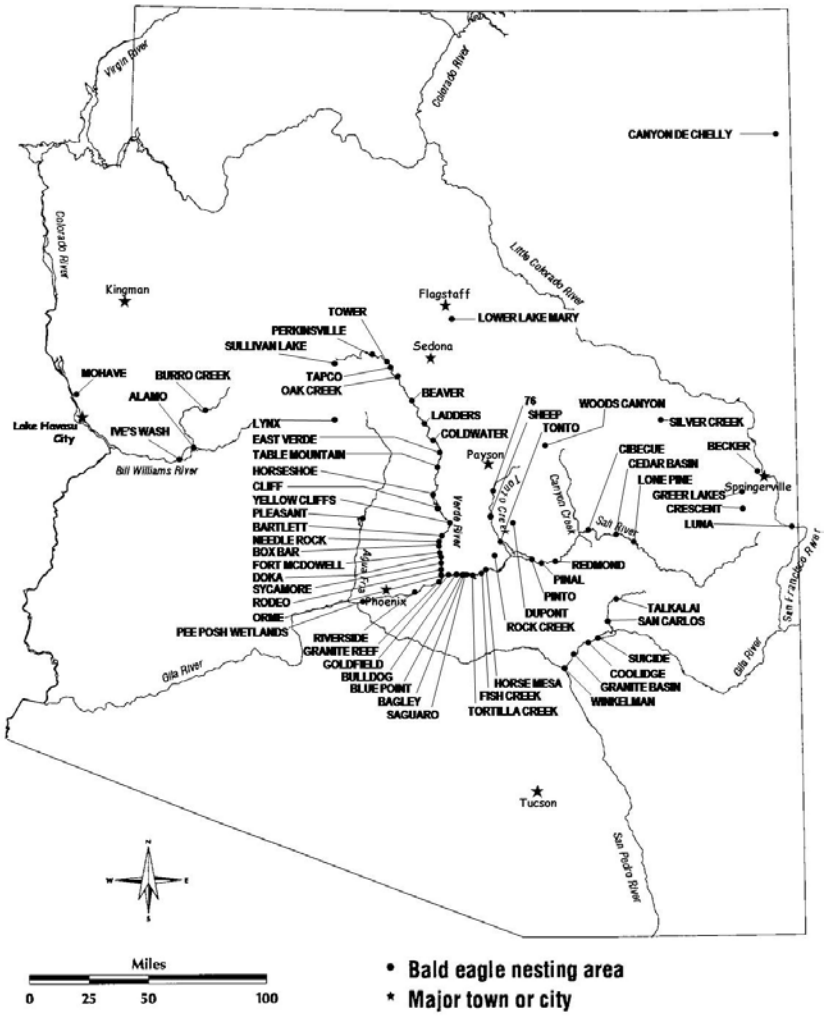

Figure 1. Location of known bald eagle BAs in Arizona, 2011.

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

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

ARIZONA BALD EAGLE WINTER COUNT

INTRODUCTION

Because bald eagles are nomadic in winter, national winter surveys are an effective tool to monitor the species throughout its range (Stalmaster 1987). The knowledge of wintering bald eagle habitat use allows for the consideration and implementation of management to protect important wintering areas. Even though the USFWS delisted the species nationwide in 2007 (USFWS 2007), the importance of the national winter count persists. Through each state's consistent efforts, the winter count will continue to provide post-delisting data on national population trends (Steenhof et al. 2002, 2008).

The National Wildlife Federation (NWF) initiated and organized the national midwinter bald eagle count from 1979-1992. Coordination shifted to the U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Snake River Field Station (USGS), which in 2007 partnered with the ACE, who now coordinates the national winter count effort. Arizona participated in the program from the 1970s to the early 1980s (e.g. Todd 1981). However, in 1986 the national coordinators changed the survey protocol to only count areas of high bald eagle concentrations (routes with more than 15 bald eagles observed in 2 or more years). Due to

Arizona's lack of "concentrations", we contributed minimal information in 1986 and 1987, and surveyed only specific management areas in 1989-1991 such as Roosevelt Lake and Nankoweap Creek (e.g. Brown and Stevens 1992). Arizona's statewide winter counts resumed in 1992, using a combination of terrestrial (foot, snowmobile, vehicle), boat, and aircraft surveys (e.g. McCarty and Jacobson 2010). In 1995, AGFD and NWF established 115 standardized routes for Arizona's bald eagle winter count. In 2005, after 10 years of surveying the 115 established routes, we analyzed the data to eliminate those routes that did not meet USGS standards, and included new routes for future surveys. If a route produced 3 or fewer birds during the past 10 years of surveys, the route was dropped per USGS protocol. As a result, in 2006 we dropped 23 routes and added 12 new routes to the survey for a net result of 104 standardized routes. Additionally, in order to simplify reporting of data to ACE we dropped two more routes in 2008, Lake Mead and Lake Mohave, for a total of 102 standardized routes. These routes covered areas along the Colorado River both in Arizona and Nevada, and will be reported by the state coordinators of the Nevada winter count.

METHODS

We continued to use, and strived to complete, the established 102 standardized survey routes for the 2011 Arizona bald eagle count. Additional routes were completed and integrated into this document for management purposes, but were not included in the results submitted to the ACE. We scheduled the winter count for January 3-9, 2011, which included weekdays for agency personnel and a weekend for volunteers. The short survey period minimized the chance for any large-scale bald eagle movements between survey routes and related duplicate counts.

We used a variety of survey methods due to the diverse habitats in Arizona and our desire to maximize (but not duplicate) statewide coverage in a narrow period with minimal effort. The best method to survey the rugged terrain and deep canyons of linear drainages was by helicopter. USBR and SRP contributed a total of 4 days of helicopter time for 2-3 biologists and a pilot to fly 25 routes. While the helicopter's altitude and speed were dependent upon terrain, height and density of power lines, and wind speed, a height of 31-61 m (100-200 ft) above ground level and 55-65 knots (63-75 mph) was optimum for observing bald eagles. Highways, large lakes, and point counts were surveyed by boats, vehicles, and on foot. We solicited surveyors for terrestrial and aquatic surveys from cooperating agencies and volunteers from private groups. We supplied survey forms from ACE and instructed participants on the National Survey Protocol.

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

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

Pima, and Pinal counties. However, Greenlee, Maricopa, and Pinal counties are surveyed for wintering bald eagles, in part, by the helicopter flights.

RESULTS AND DISCUSSION

The 2011 Arizona bald eagle winter count tallied 222 bald eagles (Table 1). We documented 157 adults (70.7%), 57 subadults (25.7%), and 8 unknown eagles (3.6%) (Tables 1 & 2). The highest number of bald eagles observed during ground surveys occurred in Coconino County (n=46, 28 routes), with the largest concentration seen on a single ground survey occurred at the FH-3 Lakes (n=13) (Appendix A). Also, a large number of bald eagles were observed by helicopter along the nine Salt River drainage routes (n=58, or 26.1% of the total count).

Table 1. Summary of the Arizona bald eagle winter count 2011.

County	Routes surveyed	Minutes	Adult	Subadult	Unknown[1]	Total	Total/ Hour
Apache	13	445	18	1	1	20	2.7
Cochise	2	273	1	0	0	1	0.22
Coconino[2]	28	3,927	31	11	4	46	0.7
Graham	Not surveyed.						
Mohave	1	95	3	1	0	4	2.5
Navajo	16	857	13	13	2	28	2.0
Santa Cruz	1	60	0	0	0	0	0
Yavapai	6	1,960	6	4	0	10	0.31
Yuma and La Paz	1	185	1	0	1	2	0.65
Verde River drainage	3	248	24	9	0	33	8.0
Salt River drainage	9	391	44	14	0	58	8.9
Gila River drainage	8	242	13	4	0	17	4.2
Various helicopter	5	30	3	0	0	3	6.0
Totals	93	8,713	157	57	8	222	1.5

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

An additional four bald eagles were counted on four non-standardized routes (Appendix A), but were not included in summary results.

In 2011, Arizona surveyed 93 of the 102 standardized routes (91%) (Table 2). Survey effort was below the long-term average, with a total of 8,713 minutes (145 hours). Coconino County had the most number of routes and therefore had the most effort with 3,927 minutes (65.5 hours) (Appendix A). Deep snow and muddy roads caused several areas to be inaccessible, including most of the 9 routes that were not surveyed. Poor road conditions or other access issues limited 8 other routes to being only partially surveyed.

Despite some challenging conditions, weather during the survey overall did not seem to be unusual. Surveyors are asked each year to rate the weather during the count compared to previous years as being either very mild, mild, normal, harsh, or very harsh. Most responded that this year's weather was normal (77% of responses, n=65), and a few responded harsh (15%, n=13), mild (7%, n=6), or very mild (1%, n=1). There were no responses for very harsh weather.

Table 2. Summary of Arizona bald eagle winter counts 1995-2011.

Year	Survey time (min)	Surveys completed	Birds/minute	Adults	Subadults	Unknown[3]	Total
1995	9,563	103	0.025	164 (66%)	76 (31%)	8 (3%)	248
1996	7,255	102	0.049	232 (64%)	127 (35%)	2 (1%)	361
1997	7,718	96	0.044	193 (56%)	134 (39%)	16 (5%)	343
1998	7,190[1]	93	0.041	183 (63%)	103 (36%)	4 (1%)	290
1999	8,378[1]	105	0.050	248 (62%)	144 (36%)	11 (3%)	403
2000	9,402[1]	110	0.034	202 (62%)	115 (35%)	8 (2%)	325
2001	8,726[1]	108	0.024	141 (66%)	70 (32%)	5 (2%)	216
2002	9,032	109	0.044	236 (59%)	147 (37%)	19 (5%)	402
2003	10,036[1]	110	0.036	232 (64%)	118 (33%)	12 (3%)	362
2004	10,587	110	0.034	243 (66%)	113 (31%)	13 (3%)	369
2005	8,910	97	0.069	153 (68%)	56 (25%)	15 (7%)	224
2006[2]	10,074	104	0.031	239 (74%)	77 (24%)	7 (2%)	323
2007	11,632[1]	100	0.024	192 (68%)	81 (29%)	8 (3%)	281
2008	9,362	96	0.020	152 (82%)	29 (16%)	4 (2%)	185
2009	9,357	94	0.022	139 (68%)	62 (30%)	3 (2%)	204
2010	9,138[1]	96	0.028	159 (63%)	81 (32%)	12 (5%)	252
2011	8,713[1]	93	0.025	157 (71%)	57 (26%)	8 (4%)	222
Average	9,122	102	0.035	192 (65%)	94 (32%)	9 (2%)	295

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

Similarly, ice cover was rated as being normal (68%, n=54), more than normal (25%, n=20), much more than normal (4%, n=3), and less than normal (3%, n=2). There were no responses for much less than normal ice cover.

The total of 222 bald eagles counted in 2011 was much lower than the average of 299 birds counted annually during standardized counts, 1995-2010, and represents the third-lowest total count. When including this year's count, the average since 1995 drops to 295 birds. On 47 (51%) of the 93 routes no bald eagles were counted, and on 24 (26%) other routes just one bald eagle was counted.

The age composition of the 2011 bald eagle winter count was 71% adults, 26% subadults, and 4% unknown. This represents a slightly higher ratio of adults to subadults than typically seen in Arizona's winter counts, which has averaged 65% adults, 32% subadults, and 3% unknown (Table 2).

MANAGEMENT RECOMMENDATIONS

1. Maintain the current 102 standardized routes.
2. Continue to assess non-standardized routes and add new routes for areas with consistent sightings of more than 3 bald eagles. The national coordinators require at least 4 years of data before a route is included in trend analyses.

3. Maintain winter count consistency by following established routes and methods to enable long-term analysis.
4. Continue updating the Nongame Branch bald eagle winter count database with information from the standardized survey forms.
5. Compile spatial data from winter count survey maps to document the location and abundance of wintering bald eagles, spatially identify important habitat use areas, and develop statewide maps for distribution to cooperating agencies.

ARIZONA BALD EAGLE NEST SURVEY

INTRODUCTION

The bald eagle nest survey enhances our understanding of breeding bald eagle ecology in Arizona. Discovery of new BAs and alternate nests within BAs, coupled with the knowledge of current and historical BAs, allows for an accurate description of the distribution, status, and annual productivity of the breeding population in Arizona. Timely discovery of BAs also identifies sensitive areas requiring proactive management to prevent potentially adverse impacts.

In 1972, concern about bald eagle population declines nationwide prompted surveys for the species throughout Arizona (Rubink and Podborny 1976). These annual surveys have continued to the present, excluding 1976 and 1977 (e.g. McCarty and Jacobson 2010). The AGFD administered and performed the 2011 nest surveys in cooperation with the SWBEMC.

METHODS

Habitat quality, the presence of nests, previous bald eagle sightings, and spacing between BAs prioritized survey effort. We monitored breeding activity at current and historical BAs, and nest sites discovered between 1992 and 2010 (e.g. McCarty and Jacobson 2010). We also investigated reports of bald eagles and nests by other agencies, biologists, and the public. A two to three-person team conducted surveys between January and June 2011. Winter count flights (January), monthly Occupancy and Reproductive Assessment (ORA) flights (February to June), and nest search flights (April and May) were used to locate nests and survey for new BAs. Timing of the ORA flights corresponded with the timing of different breeding stages (incubation, hatching, nestling, and fledging).

Boats, helicopters, and vehicles were used to access survey areas. Helicopters, provided by APS, SRP, and USBR, flew at approximately 60 meters (200 ft) above ground level and at 50-60 knots (58-70 mph). Drainage topography, high-tension wires, and wind influenced altitude and speed. If nest occupancy could not be determined from the air, a ground survey ensued. We used Questar® spotting scopes (40-160x), binoculars (10x), and nest map atlases from Hunt et al. (1992) and SRP (2010) to relocate historical BAs and find alternate nests in existing BAs. New nests were numbered consecutively according to the last number assigned within that BA as reported in previous Arizona bald eagle nest survey reports (e.g. McCarty and Jacobson 2010).

Determination of breeding status followed operational definitions derived from Postupalsky (1974, 1983) and Steenhof and Kochert (1982) (Appendix B). Additionally, we use the terms "tall" and "short" in this section to describe heights of cliffs, and "large" and "small" to describe the size of trees and nests. "Tall" and "large" refer to substrates and nests we deemed suitable for breeding bald eagles as compared to current bald eagle nests and locations in Arizona (e.g., Grubb and Eakle 1987). The terms "small" and "short" refer to structures and nests of inadequate height and size. A "nest site" refers to a nest of large size (unless otherwise noted) in appropriate bald eagle habitat that has not been documented as having been built or used by bald eagles, but which is routinely monitored for its potential to be utilized by bald eagles.

RESULTS

We examined all known BAs (n=62) for breeding activity (Fig. 1). Of 55 occupied BAs, 51 pairs were active, and 34 pairs successfully produced 56 fledglings (Table 3; Appendix C). Significant findings of the 2011 nest survey include 1 new bald eagle BA, 4 new alternate bald eagle nests, 5 fallen or partially fallen nests within BAs, and 3 potential nest sites. Additionally, we surveyed 1 BA on the Nevada side of the Colorado River, which was discovered in 2010 by the NPS, however only nests on the Arizona side of the river were included in summaries.

Table 3. Summary of Arizona bald eagle productivity 2011.

Number of BAs	62	Number of Active BAs	51
Number of Occupied BAs	55	Number of Failed Breeding Attempts	17
Number of Eggs	79	Number of Successful Breeding Attempts	34
Nest Success = 34/55	0.62	Number of Young Hatched	66
Mean Brood Size = 56/34	1.65	Number of Young Fledged	56
		Productivity = 0.62*1.65	1.02

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

New Locations Surveyed (Table 4)

Bill Williams River. – During a golden eagle survey flight on March 10, we found one new large cliff nest (#1) near the river, west of Mississippi Wash. The nest was empty on March 30. No bald eagles were seen.

Black Canyon (Colorado River). – In 2010, we received confirmation from National Park Service (NPS) biologists of a bald eagle pair with one nestling in a cliff nest (#1) on the Nevada side of the Colorado River within the Black Canyon Wilderness unit of Lake Mead National Recreation Area. This year, during a March 30 survey of the river, we found two three-week old nestlings in the nest. Although the NPS reported the adult breeders as unbanded in 2010, it is possible the eagles originated from natal areas within Arizona or potentially southern California. We will continue to monitor this area.

Mohave (Colorado River; AZ). – On March 10, we found a bald eagle incubating in a new cliff nest (#1) during an aerial survey for golden eagle nests. We named the breeding area Mohave, located on the Havasu National Wildlife Refuge north of Lake Havasu City.

Nevada Bay (Colorado River; AZ). – During a golden eagle survey flight on February 23 we found a new large cliff nest (#1) on a small, unnamed mountain in the vicinity of Nevada Bay. One immature bald eagle was standing in the nest, and two other immatures were perched nearby, however on March 30 the nest was empty. We will continue to monitor this area.

Kinnikinick Lake. – On June 1, we saw one adult bald eagle at the lake. No new nests were found.

Popcorn Canyon. – On March 16, we saw two adults and one immature bald eagle along the Salt River by Popcorn Canyon. No new nests were found.

Ringbolt Rapids (Colorado River; AZ). – On March 30, we found one new large cliff nest (#1) in a side canyon near Ringbolt Rapids. We will continue to monitor this area.

Salome Creek. – On March 16, we saw one immature bald eagle along the creek.

Table 4. 2011 Arizona bald eagle nest survey summary, new locations.

Location	Date	Survey Method	Results
Ashurst Lake	6/1	Helicopter	No new nests or bald eagles.
Black Canyon (NV)	3/30	Helicopter	Two 3-week old nestlings in nest #1. Two adults in area.
Bill Williams River	3/30	Helicopter	One new, large cliff nest #1. No bald eagles.
Goldwater Lake	3/15	Helicopter	No new nests or bald eagles.
Kinnikinick Lake	6/1	Helicopter	One adult in area. No new nests.
Mohave (Colorado River, AZ)	3/10, 3/30	Helicopter	3/10- One adult incubating in new cliff nest #1. 3/30- Failed. Nest empty and no eagles
Nevada Bay (Colorado River, AZ)	2/23, 3/30	Helicopter	2/23- One new large cliff nest (#1) found during golden eagle survey. Three immatures bald eagles in area.
Popcorn Canyon (Salt River)	3/16	Helicopter	Two adults and one immature in area.
Ringbolt Rapids (Colorado River, AZ)	3/30	Helicopter	One new large cliff nest #1.
Salome Creek	2/1, 3/16	Helicopter	3/16- One immature in area. No new nests.
Scholz Lake	6/1	Helicopter	No new nests or bald eagles.
Sheep Creek	3/15	Helicopter	No new nests or bald eagles.
Silver Creek	4/30, 6/3	Helicopter	No new nests or bald eagles.
Topock Marsh	3/30	Helicopter	No new nests or bald eagles.

Historic Breeding Areas (Table 5)

Hell Point. – On January 3, we saw an adult bald eagle in the area. On March 15, there was a golden eagle incubating in nest #2, which was also seen incubating or brooding on April 20.

Upper Lake Mary. – On June 1, ospreys were active in nests #1,2, 3, 4, and 5. Nest #6 was not seen.

Table 5. 2011 Arizona bald eagle nest survey summary, historic breeding areas.

Location	Date	Survey Method	Results
Camp Verde	1/31	Helicopter	No new nests or bald eagles.
Canyon	1/4, 3/16	Helicopter	All known nests empty. No bald eagles.
Chino	1/31	Helicopter	No new nests or bald eagles.
Devil's Post	1/31, 3/15	Helicopter	All known nests empty. No bald eagles.
Hell Point	1/3, 1/31, 3/15, 4/20	Helicopter	1/3- One adult in area. 3/15- One golden eagle incubating in nest #2.
Mule Hoof	1/5, 3/16	Helicopter	All known nests empty. No bald eagles.
Upper Lake Mary	6/1	Helicopter	6/1- Ospreys active in nests #1, 2, 3, 4, 5. No bald eagles.
Winkelman	3/16	Helicopter	No new nests or bald eagles.

Survey Sites with Existing Large Nests (Table 6)

Bear Canyon Lake. – On June 1, ospreys were active in nests #1 and 2. No bald eagles were seen.

Blue Ridge Reservoir. – On June 1, ospreys were active in nest #2. Nests #1, 3, 4, and 5 not seen. No bald eagles were seen.

Chevelon Canyon. – On June 1, ospreys were active in nest #2 and two other ospreys were in the area. Windy conditions prevented an effective survey flight, and no other nests were seen. No bald eagles were seen.

Granite (Verde River). – On March 15, a golden eagle was incubating in nest #2, however the nest attempt failed by April 20.

JD Dam Lake. – On June 1, ospreys were active in nest #1. No bald eagles were seen.

Knoll Lake. – On June 1, ospreys were active in nest #1. No bald eagles were seen.

Muldoon. – On January 3, one immature bald eagle was seen in the area.

Parker Canyon. – On February 1, two golden eagles were seen flying in the area, one of which flew in an undulating pattern indicative of courtship/territoriality. On March 16, one golden eagle was seen flying low in the area. No nests were seen.

West Clear Creek. – On January 3, one adult bald eagle was seen along the creek. The small nest discovered in 2007 was not seen.

White Horse Lake. – On June 1, ospreys were active in nests #1 and 2. No bald eagles were seen.

Willow Springs Lake. – On June 1, ospreys were active in nests #1 and 4. On July 21, ospreys were also seen active in snag nest #5. No bald eagles were seen.

Table 6. 2011 Arizona bald eagle nest survey summary, potential nest sites.

Location	Date	Survey Method	Results
Bear Canyon Lake	6/1	Helicopter	Ospreys active in nests #1, 2. No bald eagles.
Blue Ridge Reservoir	6/1	Helicopter	Osprey active in nest #2. No bald eagles.
Chevelon Canyon Lake	6/1	Helicopter	Osprey active in nest #2. No bald eagles.
Dogtown Lake	6/1	Helicopter	All known nests empty. No bald eagles.
Eagle (Eagle Creek)	1/7	Helicopter	No new nests or bald eagles.
Granite (Verde River)	1/3, 1/31, 3/15, 4/20	Helicopter	3/15- One golden eagle incubating in nest #2. 4/20- Golden eagle nest empty, failed.
JD Dam Lake	6/1	Helicopter	Osprey active in nest #1. No bald eagles.
Knoll Lake	6/1	Helicopter	Osprey active in nest #1. No bald eagles.
Mormon Pocket (Verde River)	1/3, 1/31, 3/15, 4/20	Helicopter	All known nests empty. No bald eagles.
Muldoon (Verde River)	1/3, 3/15	Helicopter	1/3- One immature in area. All known nests empty.
Parker Canyon	2/1, 3/16	Helicopter	2/1- Two golden eagles in area. 3/16- One golden eagle in area.
Pinto Creek	4/30	Helicopter	All known nests empty. No bald eagles.
Sullivan (Verde River)	3/15	Helicopter	All known nests empty. No bald eagles.
Tremaine/Soldier Annex/ Soldier/Long Lakes	6/1	Helicopter	No new nests or bald eagles.
Watson Lake	1/31, 3/15, 4/20	Helicopter	All known nests empty. No bald eagles.
West Clear Creek	1/3	Helicopter	One adult in area. No new nests.
White Horse Lake	6/1	Helicopter	Ospreys active in nests #1, 2. No bald eagles.
Willow (Willow Creek)	1/7	Helicopter	No new nests or bald eagles.
Willow Springs Lake	6/1, 7/21	Helicopter, Ground	Ospreys active in nests #1, 4, 5. No bald eagles.

Breeding Areas (Table 7)

Alamo. – On February 14-15, two adult bald eagles were seen constructing a new cliff nest (#8). On March 15, they were incubating in the new nest.

Bagley. – On January 4, one adult bald eagle was seen standing in nest #1. Two other adults were perched on the cliffs just upstream, and may have been the resident pair for the Saguaro BA. On February 4, we identified one adult with blue Visual Identification (VID) band 15/P eating a fish in the nest area. This eagle is the same male that has bred at Bagley in 2009-2010. Nestwatchers stationed at the Saguaro BA reported seeing a pair of adults in the Bagley BA on several occasions, including once when the pair was briefly seen at nest #1, however no egg-laying was observed.

Burro Creek. – On January 16, we received a report from the public of two vocal adult bald eagles on Burro Creek at Bonanza Wash, approximately 3 miles from the old nest area. We

found no new nests or bald eagles on two helicopter searches and will continue to monitor this area.

Cliff. – On January 31, one adult bald eagle was perched by nest #6, with a second adult perched downstream at the cliffs. Additional reports by nestwatchers and USFS personnel confirmed a pair of eagles copulating and nest-building, however no egg-laying was observed.

Copper Basin Reservoir (CA). – On March 30, we saw one adult bald eagle in nest #1. There also appeared to be at least one nestling, however this was not confirmed due to the fullness of the tree's leaf cover which prevented a clear view into the nest. The Metropolitan Water District of Southern California observed an adult that appeared to be incubating in January, and confirmed two fully-feathered nestlings in late April, with a fledging range of May 12-24.

Granite Basin. – On January 4, there were two adult bald eagles perched together in the area. On March 16, we found an adult incubating in a new cliff nest (#2).

Granite Reef. – On January 7, we found that nest #4 had fallen.

Pee Posh Wetlands. – On January 3, we saw two adult bald eagles perched by a new snag nest (#2), and on January 31 they were incubating in the new nest. On July 5, we received a report from the public that the nest tree had fallen during an intense dust storm.

Pinto. – USFS personnel reported an incubation range of January 6-9. On January 31, the nest was empty and only one adult was seen in the area. On November 30, USFS personnel reported that nest #7 had fallen.

Rodeo. – On January 31, we found an adult bald eagle incubating in a new cottonwood tree nest (#4). Also, nest #2 had partially fallen.

San Carlos. – SCAT biologists reported two adult bald eagles at nest #6 in January, and on February 1 the nest was in good condition and appeared to have been maintained. However, no eagles were seen and no new nests were found during helicopter searches of the area.

Sullivan Lake. – On July 11, we received a report from the public that nest #2 had fallen, presumably during a storm in the previous week.

Tower. – On January 20, one near-adult bald eagle was seen soaring in the area and on January 31 an adult bald eagle was seen perched by the Verde River at Sycamore Creek.

Table 7. 2011 Arizona bald eagle nest survey summary, breeding areas (continued next page).

Location	Date	Survey Method	Results
Alamo	1/11, 1/31, 2/14, 2/15, 3/15, 3/30, 4/20, 5/10	Helicopter, Ground	3/15- One adult incubating in new cliff nest #8. Second adult flew to nest.

Table 7 continued.

Location	Date	Survey Method	Results
Bagley	1/4, 2/4, 3/16	Helicopter, Boat	1/4- One adult standing in nest #1. Two other adults in area. 2/4- One adult in area.
Becker	4/21	Ground	All known nests empty. No bald eagles.
Blue Point	1/4, 2/1, 3/16	Helicopter	All known nests empty. No bald eagles.
Burro Creek	1/31, 3/15	Helicopter	No new nests or bald eagles.
Cedar Basin	1/5, 3/16, 4/30	Helicopter	All known nests empty. No bald eagles.
Cliff	1/3, 1/31, 3/15	Helicopter	1/31- One adult perched by nest #6. Second adult in area.
Copper Basin (CA)	3/30	Helicopter	One adult in nest #1 possibly with one nestling.
Dupont	2/1, 3/16	Helicopter	No new nests or bald eagles.
Granite Basin	1/4, 3/16, 4/30, 6/3	Helicopter	3/16- One adult incubating in new cliff nest #2.
Granite Reef	1/3, 1/31, 3/15, 3/16, 4/19	Helicopter, Ground	1/7- Nest #4 fallen.
Greer Lakes	3/16	Helicopter	All known nests empty. No bald eagles.
Pee Posh Wetlands	1/3, 1/31, 2/25, 3/15, 4/20	Helicopter, Ground	1/3- Two adults perched by new snag nest #2.
Pinto	1/4, 2/1, 3/16	Helicopter	1/31-Nest #7 empty. 11/30- Nest #7 fallen.
Rock Creek	2/1, 3/16, 4/30	Helicopter	All known nests empty. No bald eagles.
Rodeo	1/3, 1/31, 2/7, 3/15, 3/28, 3/31, 4/20, 4/29	Helicopter, Ground	1/31- One adult incubating in new nest #4. Nest #2 partially fallen.
San Carlos	1/4, 2/1, 3/16, 4/30	Helicopter	All known nests empty. No bald eagles.
Sullivan Lake	1/3, 1/31, 3/15, 4/20	Helicopter	7/11- Nest #2 fallen.
Tower	1/3, 1/20, 1/31, 3/15	Helicopter, Ground	All known nest empty. 1/31- One adult in area.

Overview

Significant findings of the 2011 nest survey include: 1 new bald eagle BA, 4 new alternate bald eagle nests within BAs, 5 fallen or partially fallen nests within BAs, and 4 new potential nest sites. In 2011, we documented a record number of occupied BAs, active BAs, successful breeding attempts, and number of young fledged (Table 8). In addition, we confirmed a new BA on the Nevada side of the Colorado River.

The new bald eagle BA in Arizona (Mohave) was found on the Colorado River north of Lake Havasu City in an area of the Havasu National Wildlife Refuge that we survey infrequently, so it is unknown whether or not this is the first year of breeding at the site. The closest known BAs, and most likely sources of origin for the newly discovered pair, are Copper Basin in California (25 miles), and Alamo and Ive's Wash at Alamo Lake in Arizona (50 miles). The Burro Creek

BA (56 miles) is also in the region, however we have seen no breeding attempts since 2007 and no young are known to have fledged there.

Farther north of the Mohave BA, another bald eagle nest was discovered last year by NPS biologists in the Black Canyon, a narrow, steep-walled portion of the Colorado River that was included on our survey this year. Although the current nest is on the Nevada side of the river, the eagle pair could construct alternate nests in Arizona in the future and this BA remains of high interest to us. Also, when progeny from this nest reach breeding age, they could establish territories anywhere along the river corridor. The closest known BAs as potential origins of the Black Canyon nesting pair are 90-130 miles distant (Mohave, Copper Basin, Alamo, and Ive's Wash), which is within the dispersal range from natal areas of Arizona eagles but raises the intriguing possibility of nearer, undiscovered nesting areas in the region.

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

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

	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Number of BAs	62	62	59	56	53	50	47	46	47	46
Number of occupied BAs	55	52	50	48	48	43	39	40	42	41
Number of eggs (minimum)	79	69	78	71	74	68	57	59	46	57
Number of active BAs	51	48	48	44	45	39	36	39	31	34
Failed breeding attempts	17	21	19	14	20	11	12	12	13	11
Successful breeding attempts	34	27	29	30	25	28	24	27	18	23
Young hatched	66	57	68	65	61	55	48	50	35	46
Young fledged	56	44	47	53	42	42	37	42	25	37
Nest success	0.62	0.52	0.58	0.63	0.52	0.65	0.62	0.67	0.43	0.56
Mean brood size	1.6	1.6	1.6	1.8	1.7	1.5	1.5	1.6	1.4	1.6
Productivity	1.0	0.85	0.94	1.10	0.87	0.98	0.95	1.05	0.6	0.9

MANAGEMENT RECOMMENDATIONS

1. Future survey efforts should continue to monitor historical BAs, potential breeding habitat, and large nests reported in previous nest survey reports. These documents are useful tools for identifying occupancy trends, locating new BAs, and monitoring population expansion.
2. Bald eagles banded in Arizona have been observed near or on El Novillo Reservoir, Sonora, Temecula Lake, California, and southwestern New Mexico. This suggests that the current distribution may extend into Sonora, Mexico, Southern California, and western New Mexico. Identifying breeding bald eagles through banding, visual identification and transmitters

would clarify the extent to which the bald eagles hatched in Arizona reach into these surrounding areas, and would help to accurately estimate survivorship.

3. Determine the identification of the breeding pair at Copper Basin, CA and yearly band the nestlings.
4. Surveyors should continue to use the nest survey, ORA, and winter count flights, in concert with follow-up ground surveys to inspect areas. From the air, surveyors can easily cover large sections of bald eagle habitat. Follow-up ground surveys thoroughly investigate an area.
5. Examine the following areas for breeding bald eagles and/or nests:
   - Agua Fria River drainage – Up and downstream from Lake Pleasant.
   - Anderson Mesa Lakes – Ashurst Lake, Deep Lake, Horse Lake, Kinnikinick Lake, Long Lake, Marshall Lake, Potato Lake, Prim Lake, Tremaine Lake, Yaeger Lake.
   - Big Sandy River drainage.
   - Bill Williams River drainage – Bill Williams National Wildlife Refuge.
   - Black River drainage – Little and Big Bonito creeks to the confluence of the Black River, Paucity Creek, Pacheta Creek, Reservation Creek, and Osprey nesting areas on East and West Fork and main stem of the Black River.
   - Central and Eastern Mountain Lakes – Bear Canyon, Black Canyon, Blue Ridge, Casadore Springs, Chevelon Canyon, Cholla, Doney Park, Dry, George's Basin, JD Dam, Knoll, Lyman, Nash Creek, Phillips Park Tank, Paucity Lake, Point of Pines, Rogers, Tonto, White Horse, and Willow Springs.
   - Colorado River drainage – Lake Havasu, Topock Marsh, Lake Mead (Grand Wash), Nankoweap Creek, Lee's Ferry.
   - North Fork of White River – Known osprey nesting locations.
   - Gila River drainage – Lower Blue River, San Francisco River to Gila River confluence, Gila Box.
   - Salt River Drainage – Gun/Tonto Creek confluence, Mormon Flat Dam, Redmond BA to Canyon BA, Cibecue BA to Cedar Basin BA, Pinto Creek, Salome Creek, Tanks Canyon.
   - Verde River drainage – Beaver Creek, East Verde River, West Clear Creek.
   - White Mountain Lakes – Carnero, Christmas Tree, Horseshoe Cienaga, Hawley, Lee Valley Reservoir, Nelson Reservoir, Nutrioso, Pacheta, Reservation, Sierra Blanca.
   - White River – Whiteriver to confluence with Black and Salt rivers.

ARIZONA BALD EAGLE NESTWATCH PROGRAM

INTRODUCTION

In 1978, the USFS and two Maricopa Audubon Society volunteers monitored bald eagles breeding near Bartlett Reservoir to understand the effects of recreation on nesting behavior and success (Forbis et al. 1985). This monitoring effort eventually expanded to other BAs, and developed into the Arizona Bald Eagle Nestwatch Program (ABENWP). In 1986, the USFWS assumed coordination of the ABENWP on behalf of the SWBEMC, and expanded its scope. In 1991, the USFWS transferred the lead to the AGFD after passage of the Heritage Initiative, a

voter initiative creating a fund from Arizona Lottery proceeds for wildlife and natural areas conservation.

To address the continuing management needs for Arizona's breeding bald eagles, the ABENWP operates under 3 goals: conservation, data collection, and education. Due to high recreation pressures along some of Arizona's lakes and rivers, land management agencies enact seasonal closures when necessary to protect bald eagles during the breeding cycle. Nestwatchers interact with members of the public who enter these closures, educate them about bald eagles, distribute brochures, and/or direct them away from the breeding attempt. To help the land and wildlife agencies make better bald eagle management decisions, nestwatchers collect basic biological information and behavioral responses to human activities. Possibly the most tangible benefit of the ABENWP is determining when the bald eagles are in life threatening situations. Daily monitoring allows biologists to intervene in these situations, and eliminate or reduce the threat.

In this report, we summarize significant discoveries at each BA monitored by the ABENWP in 2011. Detailed reports of each monitored BA are centralized at AGFD, and distributed to the appropriate land and wildlife management agencies.

METHODS

We selected the BAs to be monitored by weighing the level of recreation activity and management needs. Included are those with seasonal closures (Bartlett, Box Bar, Cliff, Crescent, Goldfield-Kerr, Ladders, Needle Rock, Tonto, and Woods Canyon), those without (Orme, Rodeo, Saguaro, Sycamore, Tapco), and those monitored opportunistically for information (Bagley, Doka, Fort McDowell, Granite Reef, Luna). In the fall of 2010, we advertised the ABENWP contract positions through newsletters, web pages, and at university and college job placement services nationwide. Presentations, brochures, and word-of-mouth also contributed to the pool of applicants.

We held two orientation meetings, and three question and answer sessions for the selected ABENWP contractors. The two meetings offered an introduction to the program, background information on the ABENWP's role in bald eagle management, and an explanation of data forms and emergency protocols. After the orientation meetings, the contractors chose a partner, a BA, and were taken into the field. The question and answer sessions occurred after the first 10-day work period, and subsequently after every second 10-day work period. In these sessions, we discussed filling out forms, consistency in data collection, requirements for the final report, and any additional concerns or comments. When appropriate, additional problems or questions were handled on an individual basis.

Fieldwork began February 4, 2011 and continued until nestlings fledged. Teams of two nestwatchers maintained a 10 days on/4 days off schedule. During each work period, weekend observations were conducted from dawn-to-dusk to cover times of high recreation use and document the resulting habitat use of the breeding pair. Monday through Thursday observations were a minimum of eight hours with emphasis on identifying territory boundaries, home range, and overall habitat use of the breeding pair.

Nestwatchers recorded bald eagle behavior and recreation use data from assigned observation points (OP) within the BA. We selected each OP to provide optimal viewing while minimizing the impact to the breeding bald eagles. Alternate OPs were identified when the breeding pair utilized areas out of the primary OP view. Nestwatchers were provided spotting scopes, Motorola® radios, cellular telephones, and/or USFS radios for viewing and communication needs. We supplied BA maps with river and/or lake kilometer (rk/lk) designations, and a guide to commonly taken fish species. They recorded all bald eagle data on supplied forms. Nestwatchers provided their own transportation, gas, field supplies, binoculars, and housing on days off.

Within an arbitrary 1.0 km (3,300 ft) radius of a bald eagle or active nest, nestwatchers recorded all human activity and the associated bald eagle behavior. They classified bald eagle behavior in response to human activity into 7 categories: none, watched, restless, flushed, left area, bird not in area, and unknown. If the bald eagles performed their normal activities without acknowledging the human activity, nestwatchers recorded a "none" response. "Watched" was a bald eagle looking in the direction of the human activity without displaying any other observable reaction. If the bald eagle vocalized and/or moved noticeably without leaving the nest or perch, nestwatchers recorded "restless." If a bald eagle left its location quickly in response to a human activity, nestwatchers recorded a "flushed" response. "Left area" was recorded when a bald eagle became intolerant and flew away. Nestwatchers recorded "bird not in area" if a bald eagle was not present, and an "unknown" response if the bald eagle could not be observed. Activities that caused a change in bald eagle behavior, provoking a response of "restless," "flushed," and "left area" were considered significant.

At the Box Bar and Needle Rock BAs, nestwatchers recorded human activity differently than described above. Due to the high level of recreation activity at the Box Bar and Needle Rock BAs within 1.0 km of the active nest, nestwatchers only recorded the human activities and the bald eagle's associated behavior that occurred on the east side of the river, which is closed. At the Tonto BA, nestwatchers were able to document non-compliance with a water closure by observing the number of watercraft that entered the closure, in addition to recording human activity as described above. At the Woods Canyon BA, nestwatchers recorded hikers on the closure trail and watercraft at the buoy closure on weekends. Also, due to the high volume of recreationists at the lake, only activities within 25m of an eagle were recorded in addition to aircraft.

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

RESULTS AND DISCUSSION

The ABENWP monitored 19 breeding areas in 2011 including Bagley, Bartlett, Box Bar, Cliff, Crescent, Doka, Fort McDowell, Goldfield-Kerr, Granite Reef, Ladders, Luna, Needle Rock,

Orme, Rodeo, Saguaro, Sycamore, Tapco, Tonto, and Woods Canyon. The final status of the monitored BAs was 5 failed, 12 successful, 2 occupied, and 18 young fledged (Appendix C).

The Bagley, Doka, Fort McDowell, and Luna BAs were opportunistically monitored by nestwatchers at nearby BAs. Therefore, data for these BAs are not included in the following section of this report.

Bartlett Breeding Area (Appendix E)
Observation Period. – March 4 to May 2. Total monitoring 42 days/390 hours.

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

Figure 2. Bartlett breeding area. Maricopa County, Arizona. Photo by K. McCarty.

Management Activities. – 1) The USFS enacted the seasonal BA closure.

Human Activity. – Nestwatchers recorded 39 human activities during the monitoring period. Aircraft (helicopters, small planes, and motorized parachutes) accounted for 53.8%, watercraft (canoes/kayaks, rafters) for 25.6%, and terrestrial activities of 5 types for 20.5%. One type of activity elicited 1 significant response from the breeding pair. The bald eagles flushed from a perch in response to 1 motorized parachute.

Food Habits. – Nestwatchers observed 3 forage events. The male was successful in 100% (n=2) and the female was successful in 100% (n=1) of forage events. Fish accounted for 66.7% (n=2), and reptiles for 33.3% (n=1) of all events. The breeding pair was observed delivering 57 prey items to the nest, of which the male delivered 71.9% and the female 28.1%. Fish comprised 78.9% (n=45) of the deliveries, mammals 8.8% (n=5), birds 5.3% (n=3), reptiles 1.8% (n=1), and unknown prey types 5.3% (n=3). Of the 14 prey items further identified, 28.6% (n=4) were catfish (unidentified species), 14.3% (n=2) were common carp (*Cyprinus carpio*), 14.3% (n=2) were sucker species (*Catostomus sp*.), 7.1% (n=1) were black crappie (*Pomoxis nigromaculatus*), 7.1% (n=1) were rock squirrels (*Spermophilus variegatus*), 7.1% (n=1) were ground squirrels (unidentified species), 7.1% (n=1) were desert cottontails (*Sylvilagus audubonii*), 7.1% (n=1) were waterfowl (unidentified species), and 7.1% (n=1) were desert spiny lizards (*Sceloporus magister*).

Habitat Use. – The Bartlett nestwatchers identified 13 separate perch locations spanning 0.2 km of the Verde River ranging from rk 34.9 to 35.1. The bald eagle pair spent 53.0% of the observed time at rk 34.9, 46.5% at rk 35.0, and 0.4% rk 35.1.

Box Bar Breeding Area (Appendix F)
Observation Period. – February 4 to June 19. Total monitoring 100 days/784 hours.

Bald Eagle Identification. – The male was unbanded and in adult plumage (unknown origin). The female was unbanded and in adult plumage (unknown origin).
Management Activities. – 1) The USFS enacted the seasonal BA closure. 2) The owners of Rio Verde Ranch allowed ABENWP contractors to camp and monitor from their lawn. 3) ABENWP contractors were active in educating the public visiting the Rio Verde Ranch and the campground at the end of USFS road 161.

Human Activity. – Nestwatchers recorded 49 human activities within the closure. Aircraft activity (helicopters, small planes, motorized parachutes, and ultralights) represented 79.6%, and terrestrial activity of 5 types represented 20.4%. Two types of activities elicited 2 significant responses from the breeding pair. The bald eagles left the area in response to 1 off-highway vehicle (OHV) and 1 Apache helicopter.

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

Food Habits. – Nestwatchers observed one unsuccessful forage event by the male eagle during the monitoring period. The breeding pair was observed delivering 30 prey items to the nest, of which the male delivered 80.0%, the female 13.3%, and an unidentified adult 6.7%. Fish comprised 60.0% (n=18) of the deliveries and unknown prey types 40.0% (n=12). No prey items were identified to species.

Habitat Use. – The Box Bar nestwatchers identified 12 separate perch locations, spanning a 3.5 km stretch of the Verde River ranging from rk 21.5 to 25.0. The bald eagle pair spent 75.7% of the observed time at rk 25.0, 13.5% at rk 23.0, 5.9% at rk 22.0, and 4.9% at the remaining locations.

Crescent Breeding Area (Appendix G)
Observation Period. – March 20 to July 18. Total monitoring 70 days/647 hours.

Bald Eagle Identification. – The male had a blue VID band on his left leg, USFWS band on the right leg, and was in adult plumage (presumed Arizona origin). The female was unbanded and in adult plumage (unknown origin).

Management Activities. – 1) The USFS posted "No Entry" signs surrounding the nest area knoll. 2) The USFS posted a bald eagle information board along the west access road. 3) AGFD placed an elk carcass in the area for supplemental food during the Wallow firefighting activities. 4) The USFS coordinated backburns in the area to help reduce the likelihood of fire reaching the nesting knoll.

Human Activity. – Nestwatchers recorded 840 human activities during the monitoring period. Terrestrial activity of 10 different types represented 76.3%, water pursuits (boaters, float tubers, and kayaks/canoes) 23.0%, and aircraft (small planes and helicopters) 0.7%. Three types of activities elicited 4 significant responses from the breeding pair. The bald eagles were restless in response to 2 agency workers and 1 cyclist, and left the area in response to 1 small plane.

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

Food Habits. – The nestwatchers observed 67 forage events. The male was successful in 95.3% (n=43) and the female in 95.8% (n=24). Of these forage attempts, 62.7% were for fish, 32.8% birds, and 4.5% unknown. The breeding pair was observed delivering 63 prey items to the nest, of which the male delivered 63.5% and the female 36.5%. Fish comprised 61.9% (n=39) of those items, birds 34.9% (n=22) and unknown prey types 3.2% (n=2). Of the 55 prey items further identified, 67.3% (n=37) were rainbow trout (*Oncorhynchus mykiss*), 25.4% (n=14) were American coots (*Fulica americana*), 3.6% (n=2) were cutthroat trout (*Oncorhynchus clarki*), and 1.8% (n=1) each were common merganser (*Mergus merganser*) and American widgeon (*Anas americana*).

Habitat Use. – The Crescent nestwatchers identified 16 perch locations around Crescent Lake. The bald eagle pair spent 64.5% of the observed time at lk 2.2, 22.7% at lk 2.3, 8.8% at lk 2.1, and 4.0% at the remaining locations.

Goldfield-Kerr Breeding Area (Appendix H)
Observation Period. – February 4 to February 27. Total monitoring 20 days/179 hours.

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

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

Human Activity. – Nestwatchers recorded 17 human activities during the observation period. Aircraft (helicopters and small planes) represented 76.5%, and terrestrial activity of 3 different types 23.5%. Four types of activities elicited 4 significant responses from the breeding pair. The bald eagles flushed in response to 1 helicopter, hiker, and gunshot each, and left the area in response to 1 nestwatcher.

Food Habits. – The nestwatchers did not observe any foraging events or prey deliveries during the short monitoring period.

Habitat Use. – The Goldfield-Kerr nestwatchers identified 16 perch locations, spanning a 1.5 km stretch of the Salt River ranging from rk 9.4 to rk 10.9. The bald eagle pair spent 31.6% of the observed time at rk 10.3, 29.1% at rk 10.2, 13.2% at rk 10.9, 12.2% at rk 10.4, 8.5% at rk 9.9, and 5.4% at the remaining locations.

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

Granite Reef Breeding Area (Appendix I)
Observation Period. – February 4 to May 21. Total monitoring 20 days/230 hours. Nestwatchers primarily monitored the Orme BA.

Bald Eagle Identification. – The male had a blue VID band "11/B" on his left leg, USFWS band on the right leg, and was in adult plumage (2000 Ft. McDowell nestling). The female had a blue VID band "2/E" on her left leg, USFWS band on the right leg, and was in adult plumage (1991 Ft. McDowell nestling).

Management Activities. – 1) The SRPMIC continues to restrict non-tribal member use of the river area. 2) The SRPMIC police routinely visited the ABENWP contractors and patrolled the nesting area during times of elevated recreation use. 3) On April 19, one male nestling was blue VID banded "26/U" at 6 weeks of age. 4) On May 16, AGFD and SRPMIC successfully fostered a nestling that had been rescued from the Orme nest.

Figure 6. Granite Reef breeding area. Maricopa County, Arizona. Photo by Arizona Game & Fish Department.

Human Activity. – Nestwatchers recorded 201 human activities. Terrestrial activities of 12 types represented 56.2%, water activities of 5 types 32.3%, and aircraft (helicopters) 10.9%. Ten types

of activities elicited 13 significant responses from the breeding pair. The eagles were restless in response to 2 nestwatchers. They flushed in response to 2 gunshots, and 1 each to driver, canoe/kayak, fisherman, boater, and tuber. The eagles left the area in response to 1 OHV and 1 swimmer. The eagles also flushed and/or vocalized in response to 1 AGFD researcher and 1 nestwatcher.

Food Habits. – Nestwatchers were unable to observe any forage events or prey deliveries.

Habitat Use. – The Granite Reef nestwatchers identified 43 perch locations areas along the Salt River, spanning a total of 2.8 km and ranging from rk 1.0 to 3.8. The bald eagle pair spent 91.2% of the observed time at rk 3.0, 2.4% at rk 3.7, and 6.4% at the remaining locations.

Ladders Breeding Area (Appendix J)
Observation Period. – February 5 to June 5. Total monitoring 90 days/632 hours.

Bald Eagle Identification. – The male had a blue VID band "9/W" on his left leg, USFWS band on the right leg, and was in adult plumage (1998 76 nestling). The female had a blue VID band "14/U" on the left leg, USFWS band on the right leg, and was in adult plumage (2002 Luna nestling).

Management Activities. – 1) The USFS enacted the seasonal BA closure. 2) The USFS posted closure signs at the upstream and downstream access points to the Verde River. 3) One male nestling was VID banded "26/S" at 4.5 weeks of age on April 11.

Human Activity. – Nestwatchers recorded 395 human activities. Watercraft (canoes/kayaks, rafts) represented 85.8%, aircraft (helicopters, small planes) 11.1%, and terrestrial activities of 5 types 3.0%. Two types of activities elicited 2 significant responses from the breeding pair. The eagles flushed in response to 1 helicopter and 1 agency worker.

Figure 7. Ladders breeding area. Yavapai County, Arizona. Photo by K. McCarty.

Food Habits. – Nestwatchers observed 13 forage events. The male was successful in 83.3% (n=6) and the female in 85.7% (n=7) of forage events. Fish accounted for 76.9% (n=10) and unknown prey types 23.1% (n=3) of these events. The breeding pair was observed delivering 61 prey items to the nest, of which the male delivered 70.5%, and the female 29.5%. Fish comprised 49.1% (n=30) of the deliveries, mammals 18.0% (n=11), and unknown prey types 32.8% (n=20). Of the 39 prey items further identified, 58.9% (n=23) were sucker species, 23.1% (n=9) were desert cottontail, 15.4% (n=6) were common carp, and 2.6% (n=1) each were catfish species, woodrat species, and rabbit species.

Habitat Use. – The Ladders nestwatchers identified 75 perch locations along the Verde River, spanning a total of 2.5 km and ranging from rk 161.0 to 163.5. The bald eagle pair spent 34.5% of the observed time at rk 162.2, 21.5% at rk 162.8, 13.6% at rk 162.9, 9.2% at rk 162.3, 3.8% at rk 163.0, and 17.4% at the remaining locations.

Needle Rock Breeding Area (Appendix K)
Observation Period. – February 5 to May 22. Total monitoring 73 days/600 hours.

Bald Eagle Identification. – The male had a blue VID band on the left leg which was partially read as "?/T", USFWS band on the right leg, and was in adult plumage (presumed 1998 Orme nestling). The band status of the female was unknown, but was in adult plumage (unknown origin).

Management Activities. – 1) The USFS enacted the seasonal BA closure. 2) The owners of Rio Verde Ranch allowed ABENWP contractors to camp on their lawn. 3) ABENWP contractors were active in educating the public visiting the Needle Rock Recreation Area. 4) One male and one female nestling were blue VID banded "26/V" and "26/W" at 5.5 weeks of age on April 19.

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

Human Activity. – Nestwatchers recorded 49 human activities. Aircraft (helicopters, powered paragliders, small planes, ultralights, and jets) represented 53.1%, terrestrial activities of 9 types 42.9%, and watercraft (canoes/kayaks) 4.1%. Eight types of activities elicited 18 significant responses from the breeding pair. The eagles were restless in response to 1 helicopter, military helicopter, nestwatcher, and OHV each. They flushed in response to 4 nestwatchers. The eagles left the area in response to 3 drivers, 2 OHVs, 2 canoes/kayaks, 1 nestwatcher, 1 hiker, and 1 birdwatcher.

Food Habits. – Nestwatchers observed 11 forage events. The male was successful in 28.6% (n=7), the female in 0% (n=1), and an unidentified adult in 0% (n=3) of forage events. Fish accounted for 54.5% (n=6), birds 9.1% (n=1), and unknown prey types 36.4% (n=4) of these events. The breeding pair was observed delivering 14 prey items to the nest, of which the male delivered 50.0%, the female 35.7%, and an unidentified adult 14.3%. Fish comprised 42.9% (n=6) of the deliveries and unknown prey types 57.1% (n=8). No prey items were identified to species.

Habitat Use. – The Needle Rock nestwatchers identified 53 perch locations along the Verde River, spanning a total of 4.2 km and ranging from rk 25.2 to 29.4. The bald eagle pair spent

31.0% of the observed time at rk 26.1, 16.7% at rk 26.0, 8.4% at rk 25.5, 7.6% at rk 28.2, 7.3% at rk 26.7, 6.0% at rk 29.4, and 23.0% at the remaining locations.

Orme Breeding Area (Appendix L)
Observation Period. – February 4 to April 25. Total monitoring 61 days/649 hours.

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

Management Activities. – 1) The SRPMIC continues to restrict non-tribal member use of the river area. 2) The SRPMIC police routinely visited the ABENWP contractors and patrolled the nesting area during times of elevated recreation use. 3) On April 7, three female nestlings were blue VID banded "26/N", "26/P" and "26/R" at 4.5-5.5 weeks of age. 4) On July 27, AGFD and SRPMIC removed nest #6 because of the tick infestation, and constructed two alternate nest platforms in the area on September 13 and October 18.

Interventions. – On April 24, 2011, nestwatchers found one dead and one injured nestling below the nest. The live bird was taken to Liberty Wildlife where it died two days later due to a tick infestation. On April 25, AGFD rescued the remaining nestling from the infested nest and took it to Liberty where the ticks were removed. The nestling survived and was fostered to the Granite Reef nest on May 16.

Human Activity – Nestwatchers recorded 171 human activities. Terrestrial activities of 17 different types represented 84.8%, aircraft (helicopters, small planes, ultralights) 9.9%, and water activities (canoe/kayak, rafter, swimmer) 5.3%. Ten types of activities elicited 22 significant responses by the breeding pair. The bald eagles flushed in response to 3 nestwatchers, 2 agency workers, and 1 vehicle and explosion each. They left the area in response to 2 vehicles and drivers each, and 1 agency worker, helicopter, water plant alarm and rancher each. During banding and rescue operations, the eagles flushed and/or vocalized in response to 3 AGFD researchers and 2 agency workers. Nestwatchers reported 2 other unspecified responses to a fisherman and a helicopter.

Figure 9. Orme breeding area. Maricopa County, Arizona. Photo by K. McCarty

Food Habits. – Nestwatchers observed 6 forage events. The male was successful in 80.0% (n=5) and the female in 100% (n=1). Fish accounted for 33.3% and unknown prey types 66.7% of these events. The breeding pair was observed delivering 24 prey items to the nest, of which the male delivered 58.3%, the female 33.3%, and an unidentified adult 8.3%. Fish comprised 50.0% (n=12) of these deliveries, mammals 4.2% (n=1), and unknown prey types 45.8% (n=11). Of the

5 prey items further identified, 60.0% (n=3) were suckers (unidentified species), and 20.0% (n=1) each were rainbow trout and rabbit (unidentified species**).**

Habitat Use. – The Orme nestwatchers identified 80 perch locations along the Verde and Salt Rivers, spanning a total of 6.7 km ranging from rk 0.2 to 1.4 on the Verde River and rk 4.5 to 10.0 on the Salt River. The bald eagle pair spent 53.7% of the observed time at rk 0.3 (Verde River), 17.3% at rk 0.7 (Verde River), 4.3% at rk 0.2 (Verde River), 3.8% at rk 6.5 (Salt River), 3.7% at rk 0.8 (Verde River), and 17.2% at the remaining locations.

Rodeo Breeding Area (Appendix M)
Observation Period. – February 7 to May 10. Total monitoring 69 days/494 hours.
Bald Eagle Identification. – The band status and identity of the eagles was not determined.

Management Activities. – 1) The FMYN continues to restrict non-tribal member use of the river area. 2) Two male nestlings were blue VID banded "26/C" and "26/D" at 6 weeks of age on March 31.

Human Activity. – Nestwatchers recorded 9,590 human activities. Terrestrial activities of 8 types accounted for 99.0% and aircraft (helicopters and small planes) for 1.0%. Four types of activities elicited 8 significant responses from the breeding pair. The bald eagles were restless in response to 2 military helicopters, and 1 cyclist and driver each. They also flushed from a perch in response to 2 drivers and 1 gunshot and cyclist each.

Food Habits. – The nestwatchers observed 2 forage events. The female was successful in 100% (n=2; 1 bird and mammal each) of events and the male was not seen foraging. The breeding pair was observed delivering 58 prey items to the nest, of which the male delivered 37.9%, the female 62.1%. Fish comprised 24.1% (n=14) of delivered items, birds 13.8% (n=8), mammals 1.7% (n=1), and unknown prey 60.3% (n=35). Of the 23 prey items further identified, 34.8% (n=8) were largemouth bass (*Micropterus salmoides*), 21.7% (n=5) were catfish species, 13.0% (n=3) were ducks, 13.0% (n=3) were waterfowl species, and 4.3% (n=1) each were Sonoran sucker (*Catostomus insignis*), American coot, pied-billed grebe (*Podilymbus podiceps*), and an unidentified rodent species.

Figure 10. Rodeo breeding area. Maricopa County, Arizona. Photo by Arizona Game and Fish Department.

Habitat use. – The Rodeo nestwatchers identified 18 perch locations along the Verde River, spanning a total of 1.8 km and ranging from rk 3.0 to 4.8. The bald eagle pair spent 44.4% of the

observed time at rk 3.7, 34.0% at rk 4.2, 16.9% at rk 4.1, 4.4% at rk 3.7, 0.4% at rk 3.6, and 0.1% at rk 3.0.

Saguaro Breeding Area (Appendix N)
Observation Period. – February 6 to March 13. Total monitoring 30 days/236 hours. Nestwatchers also made opportunistic observations at the Bagley BA.

Bald Eagle Identification. – The band status of the male and female was reported by nestwatchers as banded and unbanded, respectively, and in adult plumage (unknown origins). They also reported a second banded male in near-adult plumage at the nest (unknown origin).

Management Activities. – 1) Nestwatchers were supplied a boat by AGFD and educated recreationists about the bald eagles.

Human Activity. – Nestwatchers recorded 699 human activities. Watercraft accounted for 91.0% and aircraft (helicopters, small planes, and large planes) for 9.0%. Three types of activities elicited 12 significant responses from the breeding pair. The bald eagles were restless in response to 1 boat and helicopter each, flushed from a perch in response to 4 boats, and left the area in response to 4 small planes and 2 boats.

Figure 11. Saguaro breeding area. Maricopa County, Arizona. Photo by K. McCarty.

Food Habits. – The nestwatchers observed 3 forage events. The male was successful in 0% (n=2) and an unidentified adult in 0% (n=1) of events. Fish accounted for 33.3% (n=1), birds 33.3% (n=1), and unknown prey types 33.3% (n=1) of these forage events. The breeding pair was not observed delivering prey items to the nest because the eggs failed to hatch.

Habitat use. – The Saguaro nestwatchers identified 27 perch locations along Saguaro Lake, spanning 2.4 km of the Salt River and ranging from rk 29.8 to 32.2. The bald eagle pair spent 27.3% of the observed time at rk 31.5, 16.1% at rk 31.7, 14.1% at rk 31.4, 11.6% at rk 31.9, 9.0% at rk 31.6, 8.2% at rk 31.8, 5.8% at rk 31.3, and 7.9% at the remaining locations.

Sycamore Breeding Area (Appendix O)
Observation Period. – February 4 to April 24. Total monitoring 57 days/507 hours.

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

Management Activities. – 1) The FMYN restricts non-tribal member use of the river area. 2) Nestwatchers, Fort McDowell Adventures, Green Zebra Tomcar tours, and community members worked collaboratively to ensure protection of eagles and promote outreach opportunities.

Human Activity. – Nestwatchers recorded 140 human activities. Aircraft (helicopters, small planes, and ultralights) accounted for 52.9%, water activities (rafters, canoes/kayaks, and swimmers) for 15.0%, and terrestrial activities (OHV, driver, horseback rider, and fisherman) for 31.4%. Three types of activities elicited 4 significant responses from the breeding pair. The bald eagles were restless in response to 2 helicopters, and flushed from a perch in response to 1 driver and rafter each.

Food Habits. – Nestwatchers observed 3 forage events. The male was successful in 100% (n=3) and the female was not observed foraging. Fish accounted for 66.7%, and carrion 33.3% of these events. The breeding pair was observed delivering 68 prey items to the nest, of which the male delivered 55.9%, and the female 44.1%. Fish comprised 67.6% (n=46) of these deliveries, birds 5.9% (n=4), mammals 2.9% (n=2), reptiles 1.5% (n=1), and unknown prey types 22.1% (n=15). Of the 11 prey items further identified, 45.5% (n=5) were green sunfish (*Lepomis cyanellus*), 27.3% (n=3) were desert suckers (*Catostomus clarki*), 18.2% (n=2) were rainbow trout, and 9.1% (n=1) were spiny softshell turtles (*Apalone spinifera*).

Figure 12. Sycamore breeding area. Maricopa County, Arizona. Photo by Arizona Game & Fish Department.

Habitat use. – The Sycamore nestwatchers identified 12 separate habitat use areas, spanning a total of 2.4 km along the Verde River ranging from rk 9.4 to 11.8, and 0.5 km along Sycamore Creek ranging from rk 0.4 to 0.9. The bald eagle pair spent 90.4% of the observed time at rk 10.4 (Verde River), 3.9% at rk 11.7 (Verde River), and 5.7% at the remaining locations.

Tonto Breeding Area (Appendix P)
Observation Period. – February 4 to May 21. Total monitoring 83 days/560 hours.

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

Management Activities. – 1) The Indian Point campground remained closed throughout the breeding season. 2) The Southwestern Willow Flycatcher Closure limited recreational activities in the area. 3) The USFS enacted the seasonal bald eagle closure. 4) AGFD maintained a buoy

line around the nest area. 4) Nestwatchers were supplied a boat by AGFD and educated recreationists about the closure and bald eagles.

Human Activity. – Nestwatchers recorded 834 human activities. Watercraft (boats, canoes/kayaks, and jet skis) represented 96.2%, aircraft (helicopters, small planes, and paragliders) 2.0%, and terrestrial activities of 4 different types 1.3%. Three types of activities elicited 3 significant responses from the breeding pair. The bald eagles were restless in response to 1 paraglider and helicopter each, and flushed from a perch in response to 1 boat. Nestwatchers observed 561 watercraft approaching the buoy closure, and 3.0% (n=17) did not comply. In addition, 69.1% (388) of these watercraft were present during weekends.

Food Habits. – The nestwatchers observed 62 forage events. The male was successful in 85.2% (n=54) and the female in 100% (n=8) of events. Fish accounted for 91.9% (n=57), birds 1.6% (n=1), mammals 1.6% (n=1), and unknown prey types 4.8% (n=3). The breeding pair was observed delivering 157 prey items to the nest, of which the male delivered 80.9%, the female 15.3%, and an unidentified adult 3.8%. Fish comprised 90.4% (n=142) of delivered items, mammals 3.2% (n=5), birds 2.6% (n=4), and unknown prey 3.8% (n=6). Of the 14 prey items further identified, 35.7% (n=5) were largemouth bass, 21.4% (n=3) were black crappie, 14.3% (n=2) each were jackrabbit and rabbit (unidentified species), and 7.1% (n=1) each were American coot and small rodent (unidentified species).

Figure 13. Tonto breeding area. Gila County, Arizona. Photo by K. McCarty.

Habitat use. – The Tonto nestwatchers identified 15 separate perch locations along Tonto Creek, spanning 7.4 km and ranging from rk 10.0 to 17.4. The bald eagle pair spent 83.8% of the observed time at rk 16.9, 4.8% at rk 16.3, and 11.4% at the remaining locations.

Woods Canyon Breeding Area (Appendix Q)
Observation Period. – April 16 to August 1. Total monitoring 107 days/612 hours.

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

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

Human Activity. – Nestwatchers recorded 115 human activities. Watercraft (boats, canoes/kayaks, fishing tubers) accounted for 57.4%, terrestrial activities of 6 different types for 37.4%, and aircraft (helicopters, small planes) 5.2%. Three types of activities elicited 5 significant responses from the breeding pair. The bald eagles were restless in response to 1 boat. They flushed in response to 2 canoes/kayaks, and 1 boat and hiker each.

Food Habits. – The nestwatchers observed 73 forage events. The male was successful in 73.1% (n=52), the female in 61.5% (n=13), and an unknown adult in 62.5% (n=8) of events. Fish accounted for 94.5% and unknown prey types 5.5% of forages. The breeding pair was observed delivering 236 prey items to the nest, of which the male delivered 75.4%, the female 14.0%, and an unidentified adult 10.6%. Fish comprised 94.1% (n=222) of delivered items and unknown prey 5.9% (n=14). Of the 212 prey items further identified, 100% were rainbow trout.

Figure 14. Woods Canyon breeding area. Coconino County, Arizona. Photo by K. McCarty.

Habitat Use. – The Woods Canyon nestwatchers identified 104 separate habitat use areas around the lake. The bald eagle pair spent 19.9% of the observed time at lk 1.1, 13.1% at lk 4.7, 9.0% at lk 0.3, 8.0% at lk 0.9, 6.0% at lk 1.7, and 44.0% at the remaining locations.

MANAGEMENT CONSIDERATIONS

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

Bartlett Breeding Area

1. Place closure signs along the river in the closure area instructing people not to get out of their canoes or kayaks when floating downriver.
2. Signs throughout the area should include Spanish in addition to English.
3. Erect a more permanent barrier to prevent vehicles from crossing the river and entering the closure. A barrier was erected before the beginning of the season but it was quickly torn down.

Box Bar Breeding Area

1. Install more bilingual signs regarding no target shooting within the ‘Airstrip’ area, especially near the ‘Cliff’ perch.

2. Install closure signs with dates along the Fort McDowell Indian Reservation boundary and along the river bank adjacent to the Box Bar recreation area.

Crescent Breeding Area

1. Since we cannot control the natural environment, it is the impact of human interaction that must be considered in depth, and a management plan developed and put in place to control this element.
2. Implement a conscientious supplementation of food (fish or elk) for this pair, if only through the tough times of February and March.

Goldfield-Kerr

1. If the bald eagles continue to nest in this area, more informational signs should be installed within the Goldfield recreation area.
2. Install closure signs along the river. Most of these would require 'T-posts', which could be pounded in before the next breeding season and signs added after the nest is viable (i.e. nestling confirmation).

Ladders Breeding Area

1. Place a few more closure signs along the river closer to the perimeter of the nest so that kayakers/boaters do not get out within the closure area, particularly the rocky shores below the eagle nest on river left and below the observation point. This is before approximately river kilometer 163.5 at Sycamore Creek where they are allowed on shore.
2. Cows were present within the closure area from February to April with no noticeable effects to the eagles or the nest. However, in April some people were seen within the closure on the ridge above the nest herding the cows out.
3. Exclude cattle from the small riparian area in Chasm Creek upstream from the creek trail crossing. This area if given minimal protection may develop into a healthy riparian area, and has been negatively impacted by cattle trampling and seeking shade.

Needle Rock Breeding Area

1. There are many signs near the entrance of the Tonto National Forest to Needle Rock and at the entrance to the Box Bar campground. However, the signs are small and wordy. Signs should be made clearer and the prohibited activities should be made more obvious (i.e., No hunting/target shooting).
2. Remove trash cans within the Box Bar campground to encourage the "Pack in / Pack out" philosophy, with proper signage to explain this concept.

Orme & Granite Reef Breeding Areas

1. More research should be conducted on a solution for inoculating eaglets against tick infestation, such as placing tick-proofing medication inside supplemental fish, which then might be delivered by the adults to the nest and fed to nestlings and/or consumed by the adults themselves.
2. An agreement should be made with the Forest Service allowing nestwatchers to park their vehicles without a Tonto Pass at Phon D. Sutton Recreation Area in order to observe the Orme and Granite Reef territories and conduct habitat research.

3. Written permission and a permit to access SRPMIC land should be provided for use to nestwatchers during time in the field. Nestwatchers were unable to freely and comfortably access SRPMIC land for the purpose of habitat research and were thus unable to confirm perch types and locations and habitat/river types.
4. The SRPMIC police dispatch should be provided with a map that includes the locations of eagle nests, the nestwatchers' primary observation point, the nestwatchers' camp, and numbered poles, as well as contact information for current nestwatchers.

Rodeo Breeding Area

1. Remind local airports and military bases of the river corridor flight advisory. Both military and private aircraft frequently flew directly over the nest and over the riparian corridor seemingly without regard.
2. Consider placing road signs stating that absolutely no stopping or parking is allowed on the Highway 87 bridge over the Verde River. The resident eagles use a perch near the west end of the bridge and cars were seen to stop or back up along the shoulder of the bridge for photo opportunities.
3. We recommend that signage (e.g., "Sensitive Wildlife Area") and law enforcement personnel restrict users of the nearby dirt bike track to the track area and grounds. People staying at the dirt bike track occasionally spilled over to the west side of the mesa in view of the eagle nest.
4. Place monofilament recovery bins and signs along the river on both sides, near the Highway 87 bridge, and especially on the west shoreline.

Saguaro Breeding Area

1. Enforcement of existing noise laws and regulations may help to reduce disturbance to the eagles from excessively loud boats and/or music.
2. Compliance with the "No Wake Zone" has been a problem mentioned in all Saguaro Lake nestwatch reports. Signs addressing this issue could be posted at bulletin boards near boat ramps.

Sycamore Breeding Area

1. Although the Sycamore and Ft. McDowell breeding areas saw little in the way of human disturbance, nestwatchers on site are useful as a preventative monitoring presence and as interpretive educators for the hundreds of site visitors.
2. Distribution of AZ Bald Eagle Nestwatch Program information could be increased and improved by means of a portable, weather-resistant display rack.
3. The presence of FMYN signs in Sycamore Creek near the jeep road crossing (at creek kilometer 1.3) seemed to minimize OHV traffic driving down the creek to the Verde River and we recommend the continued placement of these signs.
4. The FMYN Environmental Department may wish to consider bee mitigation or eradication options at the Ft. McDowell nest to enable banding of the nestlings.

Tonto Breeding Area

1. Maintain the closure buoys surrounding the eagle nest and add additional buoys behind the vegetation on the north side of the nest. This would enable nestwatchers to more

easily determine if boats are within the buoys on the backside and an extra buoy would help create a more prominent line.
2. The similarity of the eagle closure buoy markers to "No wake" buoys caused confusion for some boaters. Differently-colored buoys or a larger sign on a buoy near the closure boundary would bring better attention to actual eagle closure boundary.
3. Continue to have nestwatchers conduct dawn to dusk observations from both the observation point and the boat during weekends and holidays.
4. Continue to have nestwatchers patrol the buoy closure by boat in the early morning hours on weekdays and during fishing tournaments.

Woods Canyon Breeding Area

1. Add more signs on the trail and bulletin boards about dog leash requirements (there are signs at developed locations and at trailheads but none on the trail). Enforcement may also help, especially during the initial fledgling period. A near-miss attack by a dog on a fledgling was reported to the nestwatchers by a camp host.

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APPENDIX A: 2011 ARIZONA BALD EAGLE WINTER COUNT RESULTS

Table 9. 2011 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	30	2	1	0	0
2	Little Colorado River (LCR)	10	0	0	0	0
3	S. Fork LCR – Campground	15	0	0	0	0
4	Casa Malapais – LCR	20	0	0	0	0
5	Greer Lakes (River, Bunch, and Tunnel Reservoirs)	55	1	0	0	0
6	Sponseller Lake	20	1	0	0	0
7	Mexican Hay Lake	Not surveyed.				
8	White Mountain Hereford Ranch (Trinity, Glen Livet, McKay reservoirs)	60	7	0	0	0
9	The Ranch Lake	30	2	0	0	0
10	Ortega Lake	30	0	0	0	0
11	Concho Lake	45	2	0	0	0
12	Luna Lake	60	1	0	0	0
13	Nelson Reservoir	35	1	0	0	0
14	Nutrioso Reservoir	35	1	0	0	1
16	San Francisco River (Luna Lake to New Mexico line)	Not surveyed.				
Total		**445**	**18**	**1**	**0**	**1**
Cochise County						
18	Parker Canyon Lake[1]	93	0	0	0	0
19	Willcox Playa	180	1	0	0	0
Total		**273**	**1**	**0**	**0**	**0**
Coconino County						
21	Long Lake Complex	120	2	1	1	0
22	Stoneman Lake	135	0	1	0	0
23	FH-3	80	0	0	0	0
24	I-17, Section to Flagstaff	215	4	2	0	0
25	Bellemont	285	0	0	0	0
26	Townsend/Winona A/B	462	1	2	0	0
27	HWY 89 North /Sunset Crater – Wupatki	330	2	0	0	0
28	FH-3 Lakes (Mary, Mormon, Marshall, Prime, etc.)	506	11	2	0	0
29	Continental Country Club Lakes	160	5	0	0	0
30	Chevelon Canyon Lake	Not surveyed.				
32	Spring Valley Wash	60	1	0	0	0
33	Red Lake Valley	20	0	0	0	0
34	Kaibab Lake	20	0	0	0	0
35	Pittman Valley	20	1	1	0	1
36	Davenport Lake	10	0	0	0	0
37	Scholz Lake	120	0	0	0	0
38	Cataract Lake	20	0	0	0	0

[1]Time was averaged from previous years (1998-2010).

Table 9 continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
39	Willow Springs Lake	Not surveyed.				
40	West Chevelon Canyon	Not surveyed.				
41	Willow Creek	Not surveyed.				
42	White Horse Lake – Pomeroy Tanks	Not surveyed.				
43	JD Dam Lake	Not surveyed.				
45	Steel/Stone Road	180	0	1	0	0
48	Blue Stem Wash-Babbit property	60	0	0	0	0
49	Glen Canyon Nat'l Rec. Area (Lake Powell to Lee's Ferry)	82	2	1	0	0
118	Bill Williams Loop Road	165	0	0	0	0
119	Johnson Canyon	90	0	0	0	2
120	Highway 64 east	55	1	0	0	0
121	Highway 64	30	0	0	0	0
122	Camp Navajo	195	1	0	0	0
123	Partridge Creek	152	0	0	0	0
124	Odell Lake	40	0	0	0	0
125	Highway 87 north	95	0	0	0	0
126	Highway 180	220	0	0	0	0
Total		**3,927**	**31**	**11**	**1**	**3**
Graham County						
51	Point of Pines Lake area	Not surveyed.				
Mohave County						
57	Alamo Lake	95	3	1	0	0
Total		**95**	**3**	**1**	**0**	**0**
Navajo County						
58	Lake of the Woods	20	0	1	0	0
59	Rainbow Lake	90	1	1	0	0
61	Whipple Lake	30	0	0	0	0
62	Long Lake	30	0	0	0	0
63	Lone Pine Dam	35	0	0	0	0
64	Schoens Reservoir	60	0	0	0	0
65	White Mountain Lake	70	2	0	0	0
67	Jacques Marsh	35	3	1	0	0
68	Scott's Reservoir	40	1	0	0	0
69	Show Low Lake	90	0	0	0	2
70	Pintail Lake	12	0	0	0	0
71	Telephone Lake	10	1	7	0	0
72	Fool Hollow Lake	255	4	3	0	0
75	Cottonwood Wash/ Clay Springs	40	0	0	0	0
76	White Lake	10	0	0	0	0
127	Mortenson Wash	30	1	0	0	0
Total		**857**	**13**	**13**	**0**	**2**
Santa Cruz County						
82	Pena Blanca Lake	60	0	0	0	0
Total		**60**	**0**	**0**	**0**	**0**
Yavapai County						
83	Wet Beaver Creek	540	1	0	0	0

Table 9 continued.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
84	Oak Creek	480	1	0	0	0
85	Willow Lake	220	3	1	0	0
86	Lynx Lake	240	0	0	0	0
87	Watson Lake	240	0	2	0	0
88	Goldwater Lake	240	1	1	0	0
Total		**1,960**	**6**	**4**	**0**	**0**
Yuma and La Paz Counties						
89	Imperial N.W.R. Cibola/Martinez Lake – Colorado River	185	1	0	0	1
Total		**185**	**1**	**0**	**0**	**1**

Table 10. 2011 Arizona bald eagle winter count helicopter survey results.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
90	Verde River	210	23	9	0	0
91	Lower East Verde River	13	0	0	0	0
92	Lower West Clear Creek	25	1	0	0	0
93	Lower Salt River	114	17	8	0	0
94	Upper Salt River	89	6	1	0	0
95	Lower Tonto Creek	24	6	0	0	0
97	Lower Canyon Creek	12	0	0	0	0
98	Lower Cibecue Creek	11	0	0	0	0
100	White River	17	0	0	0	0
101	North Fork White River	33	3	0	0	0
102	Lower Black River	59	12	4	0	0
103	Big and Little Bonito Creeks	32	0	1	0	0
104	San Carlos River–Talkalai Lake	12	0	1	0	0
105	San Carlos Reservoir	23	3	1	0	0
106	Upper and Lower Gila River	68	4	0	0	0
107	Eagle Creek	50	3	0	0	0
108	Bonita Creek	17	0	1	0	0
109	Lower San Francisco River	39	1	0	0	0
110	Blue River	14	0	0	0	0
111	Sunrise Lake	1	0	0	0	0
112	Big Lake	1	0	0	0	0
114	Crescent Lake	1	0	0	0	0
115	Lake Pleasant	26	1	0	0	0
116	Del Rio Ponds	1	2	0	0	0
117	Tres Rios	19	2	1	0	0
Total		**911**	**84**	**27**	**0**	**0**

Table 11. 2011 Arizona bald eagle winter count non-standardized survey route results.						
Route Name	County	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Blue Ridge Reservoir (977)	Coconino	150	0	0	0	0
Kachina Sewage Treatment (986)	Coconino	51	1	0	0	0
Clint's Well (991)	Coconino, Yavapai	109	2	1	0	0
Road to Sacred Mountain	Yavapai	270	0	0	0	0
Total		**580**	**3**	**1**	**0**	**0**

APPENDIX B: RAPTOR REPRODUCTIVE STATUS CRITERIA

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

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

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

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

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

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

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

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

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

Pioneer Effort: The occupancy of a new nest, in previously undocumented breeding habitat, where there is no evidence of prior activity. These occur in areas monitored by the ORA flights before discovery due to: 1) the presence of a large nest built by another or unknown species, or 2) the observed suitability of the habitat.

Existing Status: A BA that shows signs of prior occupancy (e.g. multiple large nests) and/or signs of prior activity (e.g. prey remains below an existing nest) upon discovery.

APPENDIX C: 2011 ARIZONA BALD EAGLE PRODUCTIVITY

Table 12. Arizona bald eagle breeding area productivity summary, 2011 (continued next page).

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs[3]	Hatch Date	Young	Fledged	Fledge Date
Alamo	S	8	2/15-3/15	1	3/15-4/8	1	1	>6/8
Bagley*	O							
Bartlett*	F	2	1/3-1/31	1	3/2-3/13	1	Failed 4/30.	
		Nestling died in nest at 7-8 weeks of age on 4/30.						
Beaver	S	1	1/3-1/31	2	1/31-3/15	2	2	>5/3
Becker	U							
Blue Point	U							
Box Bar*	S	4	1/31-2/7	2	3/14	2	1	6/15
		One nestling died in nest at 2 weeks of age by 4/5.						
Bulldog	S	2	<1/4	2	2/1-3/16	2	2	>4/30
Burro	U							
Canyon de Chelly	S	2	<3/7	2	4/5	2	2	6/24-6/27
Cedar Basin	U							
Cibecue	F	2	1/5-3/16	1	Failed during incubation by 4/30.			
Cliff*	O							
Coldwater	S	3	1/31-3/15	2	3/15-4/20	2	2	>6/1
Coolidge	F	4	2/1-3/16	1	Failed during incubation by 4/30.			
Crescent*	S	1	1/5-3/16	1	4/10-4/12	1	1	7/18
Doka*	S	5	1/3-1/31	1	1/31-3/4	1	1	5/2
Dupont	U							
East Verde	F	6	1/3-1/31	1	Failed during incubation by 3/15.			
Fish Creek	S	1	1/4-2/1	2	2/1-3/16	2	2	4/20-4/30, >4/30
Fort McDowell*	S	15	1/31-2/7	1	3/7-3/10	1	1	5/18-6/1
Goldfield-Kerr*	F	2	<12/27	1	Failed during incubation by 2/24.			
Granite Basin	F	2	<3/16	1	<3/16	1	Failed by 6/3.	
Granite Reef*	S	2	1/3-1/31	1	2/28-3/6	1	1, FOS+1	5/9-5/13
		Fostered surviving Orme nestling on 5/16.						
Greer Lakes	U							
Horse Mesa	F	4	1/4-2/1	1	Failed during incubation by 3/16.			
Horseshoe	F	11	1/31-2/16	1	Failed during incubation by 3/15.			
Ive's Wash	S	4	1/11-1/31	1	2/14-3/15	1	1	>5/9
Ladders*	S	3	1/3-1/21	2	2/27	2	1	6/2
		One nestling died in nest at 3 weeks of age on 4/3.						
Lone Pine	S	5	1/5-3/16	3	3/16-4/30	3	3	>6/3
Lower Lake Mary	S	2	<4/14	2	4/14-4/20	2	2	6/29-7/9
Luna*	S	1	<3/7	2	3/7-3/14	2	2	4/21-6/10
Lynx	S	3	1/2-1/10	1	1/31-3/3	1	1	5/14
Mohave	F	1	<3/10	1	Failed during incubation by 3/30.			
Needle Rock*	S	2	1/3-1/31	2	3/5	2	2	5/20-5/28

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

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

[3]Represents minimum number of eggs laid.

*Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 12 continued.

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs[3]	Hatch Date	Young	Fledged	Fledge Date
Oak Creek	S	4	1/3-1/21	2	1/31-3/15	2	2	>5/3
Orme*	F/FOS-1	6	1/3-1/31	3	2/24-3/7	3		
	Two nestlings died at 7-8 weeks old due to tick infestation. Third nestling was fostered to Granite Reef on 5/16.							
Pee Posh Wetlands	S	2	1/3-1/31	2	1/31-2/25	2	2	5/6-5/25
Perkinsville	S	4	1/31-3/15	1	3/15-4/20	1	1	>6/1
Pinal	S	3	1/4-2/1	2	2/1-3/16	2	2	>4/30
Pinto	F	7	1/6-1/9	1	Failed during incubation by 2/1.			
Pleasant	F	3	<1/3	1	Failed during incubation by 1/31.			
Redmond	F	5	1/4-2/1	1	Failed during incubation by 4/30.			
Riverside	S	1	<1/4	2	1/31-2/27	2	1	3/18-4/13
	One nestling died in rehabilitation at 6 weeks of age.							
Rock Creek	U							
Rodeo*	S	4	1/3-1/31	2	2/14-2/18	2	2	4/29-5/9
Saguaro*	F	1	1/4-2/1	1	Failed during incubation by 3/8.			
San Carlos	O							
76	S	4	2/1-3/16	1	3/16-4/30	1	1	>6/1
Sheep	S	5	1/4-2/1	2	2/1-3/16	2	2	>4/30
Silver Creek	S	1	<4/30	2	<4/30	2	2	>6/30
Suicide	S	2	1/4-1/25	3	2/1-3/16	3	2	5/24-5/27
Sullivan Lake	S	2	1/3-1/31	2	1/31-3/3	2	2	5/27-5/30
Sycamore*	S	5	<1/3	2	1/3-1/31	2	1	4/24
Table Mountain	F	4	1/31-3/15	1	Failed during incubation by 4/20.			
Talkalai	S	7	1/4-1/25	1	2/1-3/16	1	1	4/30-5/27
Tapco*	F	1	1/31-3/7	2	3/26	1		
	Hatchling died by 4/1 and second egg failed to hatch.							
Tonto*	S	2	1/4-1/13	2	2/18-2/22	2	2	5/2, 5/15
Tortilla Creek	F	1	1/4-2/1	1	Failed during incubation by 3/16.			
Tower	U							
Woods Canyon*	S	3	<4/5	2	4/22	2	2	7/14, 7/17
Yellow Cliffs	S	1	1/31-3/15	2	3/15-4/20	2	2	>6/1
Black Canyon	S	1	<3/30	2	<3/30	2	1	5/13-6/2
Copper Basin	A	1	<3/30	1	<3/30	1+	No data	

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

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

[3]Represents minimum number of eggs laid.

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

*Nests monitored by the Arizona Bald Eagle Nestwatch Program.

APPENDIX D: NEST SURVEY RESULTS

Table 13. Results of the 2011 winter count, ORA, and nest survey flights.

Location	Time	Comments
January 3, 2011		
Granite Reef BA	0755	One adult standing in nest #2. Second adult in area.
Orme BA	0756	All known nests empty. No bald eagles.
Rodeo BA	0800	All known nests empty. One adult and 3 immatures in area.
Sycamore BA	0805	One adult incubating in nest #5.
Doka BA	0807	One adult standing in nest # 5. Second adult perched in area, flushed.
Fort McDowell BA	0809	One adult standing in nest #15. Second adult perched by nest, flushed.
Box Bar BA	0813	One adult perched by nest #4. Second adult perched in area.
Needle Rock BA	0817	All known nests empty. One adult in area.
Bartlett BA	0823	All known nests empty. Two adults in area.
Cliff BA	0850	All known nests empty. No bald eagles.
Horseshoe BA	0910	All known nests empty. No bald eagles.
Table Mountain BA	0923	All known nests empty. One adult flying in area.
East Verde BA	1031	All known nests empty. No bald eagles.
Coldwater BA	1043	All known nests empty. No bald eagles.
Ladders BA	1048	All known nests empty. No bald eagles.
West Clear Creek	1100	All known nests empty. One adult in area.
Beaver BA	1142	All known nests empty. Two adults in area.
Oak Creek BA	1155	All known nests empty. One adult in area.
Tapco BA	1213	All known nests empty. No bald eagles.
Tower BA	1219	All known nests empty. No bald eagles.
Mormon Pocket nest site	1318	All known nests empty. No bald eagles.
Perkinsville BA	1320	All known nests empty. No bald eagles.
Hell Point historic BA	1327	All known nests empty. One adult in area.
Muldoon nest site	1330	All known nests empty. One immature in area.
Granite nest site	1332	All known nests empty. No bald eagles.
Sullivan Lake BA	1350	One adult standing in nest #2. Second adult perched by nest.
Lynx BA	1433	One adult perched by nest #3.
Pleasant BA	1450	One adult incubating in nest #3.
Pee Posh Wetlands BA	1600	Two adults perched near new snag nest #2.
January 4, 2011		
Riverside BA	0751	One adult in nest #1 in incubating position.
Granite Reef BA	0759	All known nests empty. Two adults in area.
Orme BA	0800	All known nests empty. One adult in area.
Goldfield-Kerr BA	0803	One adult incubating in nest #2.
Bulldog BA	0809	One adult incubating in nest #2.
Bagley BA	0815	One adult standing in nest #1. Two adults in area.
Blue Point BA	0818	All known nests empty. No bald eagles.
Saguaro BA	0824	All known nests empty. No bald eagles.
Tortilla BA	0828	All known nests empty. Two adults in area.
Fish Creek BA	0839	All known nests empty. No bald eagles.
Horse Mesa BA	0847	All known nests empty. No bald eagles.
Tonto BA	0904	Two adults standing in nest #2.
Sheep BA	0910	All known nests empty. No bald eagles.
76 BA	0925	Two adults at nest #4.
Pinto BA	1105	Two adults at nest #7.
Pinal BA	1110	All known nests empty. No bald eagles.

Table 13 continued.

Location	Time	Comments
Redmond BA	1125	All known nests empty. One adult in area.
Canyon historic BA	1145	All known nests empty. No bald eagles.
Talkalai BA	1410	All known nests empty. No bald eagles.
San Carlos BA	1419	All known nests empty. No bald eagles.
Suicide BA	1434	All known nests empty. Two adults in area.
Coolidge BA	1440	All known nests empty. Two adults in area.
Granite Basin BA	1518	All known nests empty. Two adults in area.
January 5, 2011		
Cibecue BA	1015	One adult standing in nest #2.
Mule Hoof historic BA	1040	All known nests empty. No bald eagles.
Cedar Basin BA	1108	All known nests empty. One adult in area.
Lone Pine BA	1122	All known nests empty. No bald eagles.
Crescent BA	1220	All known nests empty. No bald eagles.
January 7, 2011		
Willow nest site	1026	No new nests or bald eagles.
Eagle nest site	1106	No new nests or bald eagles.
January 31, 2011		
Riverside BA	0810	Two adults standing in nest #1; one was in a half-sitting posture.
Granite Reef BA	0818	One adult incubating in nest #2. Second adult downstream. Nest #4 fallen.
Orme BA	0822	One adult incubating in nest #6.
Rodeo BA	0823	One adult incubating in new cottonwood nest #4. Nest #2 partially fallen.
Sycamore BA	0829	At least 1 nestling just hatched. Two adults in nest.
Doka BA	0830	One adult incubating in nest #5.
Fort McDowell BA	0832	Two adults perched at nest #15. Two adults and 2 immatures in area.
Box Bar BA	0835	One adult standing in nest #4.
Needle Rock BA	0836	One adult incubating in nest #2.
Bartlett BA	0841	One adult incubating in nest #2.
Yellow Cliffs BA	0846	One adult perched by nest #1. Second adult in area.
Cliff BA	0858	One adult perched by nest #6. Second adult in area.
Horseshoe BA	0911	All known nests empty. No bald eagles.
Table Mountain BA	1133	All known nests empty. No bald eagles.
East Verde BA	1140	One adult incubating in nest #6. Second adult in area.
Coldwater BA	1147	All known nests empty. No bald eagles.
Ladders BA	1151	One adult incubating in nest #3.
Camp Verde historic BA	1156	No new nests or bald eagles.
Beaver BA	1158	One adult incubating in nest #1. Second adult in area, flushed.
Oak Creek BA	1206	One adult incubating in nest #4.
Tapco BA	1216	All known nests empty. No bald eagles.
Tower BA	1220	All known nests empty. One adult in area.
Mormon Pocket nest site	1225	All known nests empty. No bald eagles.
Perkinsville BA	1229	Two adults perched at nest #4.
Hell Point historic BA	1236	All known nests empty. No bald eagles.
Granite nest site	1243	All known nests empty. No bald eagles.
Sullivan Lake BA	1250	One adult incubating in nest #2. Second adult perched in area.
Watson Lake nest site	1411	All known nests empty. No bald eagles.
Lynx BA	1420	One adult incubating in nest #3.
Devil's Post historic BA	1450	All known nests empty. No bald eagles.
Burro Creek BA	1520	No new nests or bald eagles.
Chino historic BA	1535	No new nests or bald eagles.

Table 13 continued.

Location	Time	Comments
Alamo BA	1540	All known nests empty. No bald eagles.
Ive's Wash BA	1545	One adult incubating in nest #4.
Pleasant BA	1655	Failed. Nest empty. One adult in area.
Pee Posh Wetlands BA	1717	One adult incubating in nest #2. Second adult in area.
February 1, 2011		
Goldfield-Kerr BA	1004	One adult incubating.
Bulldog BA	1007	One adult incubating.
Blue Point BA	1010	All known nests empty. No bald eagles.
Bagley BA	1015	All known nests empty. One adult in area.
Saguaro BA	1017	One adult incubating in nest #1.
Tortilla Creek BA	1025	One adult incubating in nest #1.
Fish Creek BA	1036	One adult incubating in nest #1.
Horse Mesa BA	1039	One adult incubating in nest #4.
Rock Creek BA	1045	All known nests empty. No bald eagles.
Tonto BA	1049	One adult incubating in nest #2.
Sheep BA	1054	One adult incubating in nest #5. Second adult in area.
76 BA	1107	One adult standing in nest. Second adult in area.
Dupont BA	1200	No new nests or bald eagles.
Salome Creek	1205	No new nests or bald eagles.
Parker Canyon nest site	1225	Two golden eagles in area, undulating flight.
Pinto BA	1230	Failed. Nest #7 empty. One adult flew to nest.
Pinal BA	1241	One adult incubating in nest #3.
Redmond BA	1249	One adult incubating in nest #5.
Talkalai BA	1322	One adult incubating in nest #7.
San Carlos BA	1328	All known nests empty. No bald eagles.
Suicide BA	1338	One adult incubating in nest #2.
Coolidge BA	1341	All known nests empty. One adult and one immature in area.
Granite Basin BA	1349	All known nests empty. No bald eagles.
March 15, 2011		
Riverside BA	0723	Two 5.5-week old nestlings. One adult in area.
Granite Reef BA	0732	One adult brooding at least 1 small nestling. Second adult in nest tree.
Rodeo BA	0735	Two 3.5-week old nestlings. One adult in area.
Sycamore BA	0739	Two 6.5-week old nestlings.
Doka BA	0740	One 3-week old nestling. One adult in area.
Fort McDowell BA	0743	One 1.5-week old nestling and one adult in nest #15. Second adult flew to nest, flushed.
Box Bar BA	0745	One adult incubating in nest #4.
Needle Rock BA	0746	One adult in nest feeding one 1.5-week old nestling.
Bartlett BA	0749	One adult in nest with at least one 1-week old nestling.
Yellow Cliffs BA	0755	One adult incubating in nest #1.
Sheep Creek	0759	No new nests or bald eagles.
Cliff BA	0803	All known nests empty. No bald eagles.
Horseshoe BA	0810	Failed. Nest #11 empty and no eagles.
Table Mountain BA	0819	One adult incubating in nest #4.
East Verde BA	0825	Failed. Nest empty and no eagles.
Coldwater BA	0839	One adult incubating in nest #3.
Ladders BA	0843	Two 2-week old nestlings. Adult in nest, flushed and returned to nest.
Beaver BA	0850	Two 3-week old nestlings. One adult flew to nest tree.
Oak Creek BA	0858	Two 3.5-week old nestlings.

Table 13 continued.

Location	Time	Comments
Tapco BA	0907	One adult incubating in nest #1.
Tower BA	0910	All known nests empty. No bald eagles.
Mormon Pocket nest site	0920	All known nests empty. No bald eagles.
Perkinsville BA	0922	One adult incubating in nest #4.
Hell Point historic BA	0930	One golden eagle incubating in nest #2.
Muldoon nest site	0934	All known nests empty. No bald eagles.
Granite nest site	0936	One golden eagle incubating in nest #2.
Sullivan nest site	1023	All known nests empty. No bald eagles.
Sullivan Lake BA	1025	Two 3-week old nestlings. One adult in area.
Watson Lake nest site	1225	All known nests empty. No bald eagles.
Lynx BA	1234	One adult in nest brooding at least one small nestling.
Devil's Post historic BA	1310	All known nests empty. No bald eagles.
Burro Creek BA	1339	No new nests or bald eagles.
Alamo BA	1353	One adult incubating in new cliff nest #8. Second adult flew to nest.
Ive's Wash BA	1359	One adult standing in nest with possibly one small nestling, second adult in area.
Pleasant BA	1505	All known nests empty. One near-adult bald eagle in area.
Pee Posh Wetlands BA	1542	Two 4-week old nestlings. One adult in nest, flushed and returned to nest. Second adult in area.
March 16, 2011		
Granite Reef BA	0844	One 2-week old nestling. One adult in nest.
Goldfield-Kerr BA	0847	All known nests empty. One near-adult and one immature bald eagle in area.
Bulldog BA	0853	Two 4.5-week old nestlings. One adult flying in area.
Blue Point BA	0856	All known nests empty. No bald eagles.
Bagley BA	0905	All known nests empty. No bald eagles.
Fish Creek BA	0917	Two 2-week old nestlings. One adult in nest.
Horse Mesa BA	0921	Failed. Nest empty and no eagles.
Rock Creek BA	0926	All known nests empty. No bald eagles.
Tonto BA	0932	Two 3-week old nestlings.
Sheep BA	0937	Two 2.5-week old nestlings. One adult perched, flushed.
76 BA	0947	One adult incubating in nest #4.
Dupont BA	1004	All known nests empty. No bald eagles.
Salome Creek	1010	One immature flying along creek.
Parker Canyon nest site	1019	All known nests empty. One golden eagle in area.
Pinto BA	1024	All known nests empty. No bald eagles.
Pinal BA	1028	Two 3-week old nestlings. One adult in nest.
Redmond BA	1032	One adult incubating.
Canyon historic BA	1205	All known nests empty. No bald eagles.
Cibecue BA	1221	One adult incubating in nest #2.
Mule Hoof historic BA	1223	All known nests empty. No bald eagles.
Cedar Basin BA	1238	All known nests empty. No bald eagles.
Lone Pine BA	1250	One adult incubating in nest #5. One immature in area.
Crescent BA	1316	One adult incubating in nest #1.
Greer Lakes BA	1325	All known nests empty. No bald eagles.
Talkalai BA	1521	One 2.5-week old nestling. One adult in nest.
San Carlos BA	1540	All known nests empty. No bald eagles.
Suicide BA	1553	One adult in nest incubating/brooding.
Coolidge BA	1600	One adult flew to nest, possibly incubating in nest #4.

Table 13 continued.

Location	Time	Comments
Granite Basin BA	1628	One adult incubating in new cliff nest #2.
Winkelman historic BA	1638	No new nests or bald eagles.
March 30, 2011		
Pleasant BA	0735	All known nests empty. No bald eagles.
Alamo BA	0827	One adult in nest incubating/brooding.
Bill Williams River	0840	One new large cliff nest #1. No bald eagles.
Copper Basin (CA)	0941	One adult in nest #1 possibly with at least one nestling.
Mohave BA	1030	Failed. Nest #1 empty and no eagles.
Topock Marsh	1043	No new nests or bald eagles.
Nevada Bay (AZ)	1126	One new large cliff nest #1 (first found on golden eagle survey 2/23).
Black Canyon (NV)	1146	Two 3-week old nestlings in cliff nest #1 (on Nevada side of river). Two adults perched in area.
Ringbolt Rapids	1159	One large, empty cliff nest #1. No bald eagles.
April 20, 2011		
Pee Posh Wetlands BA	0743	Two 9-week old nestlings. One adult in area.
Ive's Wash BA	0900	Banded two 6-week old nestlings.
Alamo BA	1049	One 3-week old nestling. One adult in nest. Second adult in area.
Lynx BA	1121	One 7.5-week old nestling.
Watson Lake nest site	1126	All known nests empty. No bald eagles.
Sullivan Lake BA	1253	Two 8-week old nestlings.
Granite nest site	1258	Golden eagle failed. Nest empty.
Hell Point historic BA	1302	One golden eagle incubating/brooding.
Perkinsville BA	1309	One 4.5-week old nestling.
Mormon Pocket nest site	1311	All known nests empty. No bald eagles.
Tapco BA	1315	Failed. One unhatched egg in nest. No eagles.
Oak Creek BA	1322	Two 8-week old nestlings.
Beaver BA	1327	Two 8-week old nestlings.
Ladders BA	1331	One 5.5-week old nestling. One adult in nest.
Coldwater BA	1336	At least one 3.5-week old nestling. One adult in nest.
East Verde BA	1343	All known nests empty. Two adults in area.
Table Mountain BA	1347	Failed. Nest empty. One adult in area.
Yellow Cliffs BA	1400	Two 3.5-week old nestlings. One adult in nest, flushed.
Bartlett BA	1441	One 5-week old nestling.
Box Bar BA	1424	One 4-week old nestling.
Ft. McDowell BA	1425	One 5.5-week old nestling. One adult perched.
Doka BA	1427	One 8-week old nestling. Two adults in area.
Sycamore BA	1428	One 10-week old nestling.
Rodeo BA	1430	Two 9-week old nestlings. One adult in nest.
Bulldog BA	1436	Two 9-week old nestlings.
Fish Creek BA	1441	Two 7-week old nestlings.
April 30, 2011		
Bulldog BA	0827	Two 11-week old nestlings.
Fish Creek BA	0838	One 9-week old nestling.
Rock Creek BA	0845	All known nests empty. No bald eagles.
Sheep BA	0853	Two 9-week old nestlings.
76 BA	0903	One 6-week old nestling.
Pinto Creek nest site	0925	All known nests empty. No bald eagles.
Pinal BA	0930	Two 9.5-week old nestlings. One adult flying in area.
Redmond BA	0935	Failed. Nest empty and no eagles.

Table 13 continued.

Location	Time	Comments
Silver Creek	1043	No new nests or eagles.
Silver Creek BA	1058	Two 6-7-week old nestlings in nest #1. One adult flying in area.
Cibecue BA	1125	Failed. Nest empty and no eagles.
Cedar Basin BA	1137	All known nests empty. No bald eagles.
Lone Pine BA	1146	Three 5.5-week old nestlings.
Talkalai BA	1328	One 9-week old nestling
San Carlos BA	1335	All known nests empty. No bald eagles.
Suicide BA	1345	Three 6-8-week old nestlings.
Coolidge BA	1350	Failed. Nest empty and no eagles.
Granite Basin BA	1433	One 2-3-week old nestling. One adult in nest.
June 1, 2011		
Ft. McDowell BA	0730	Nest empty. Assume fledged. One adult downstream.
Box Bar BA	0741	One 11-week old nestling. Three adults downstream.
Yellow Cliffs BA	0749	Two 9.5-week old nestlings.
76 BA	0804	One 10-week old nestling. One adult in area.
Coldwater BA	0823	Two 9-week old nestlings.
Ladders BA	0826	One 12-week old nestling.
Perkinsville BA	0847	One 10.5-week old nestling.
JD Dam Lake nest site	0858	Osprey active in nest #1. No bald eagles.
White Horse Lake nest site	0905	Ospreys active in nests #1, 2. Nest #3 empty. No bald eagles.
Scholz Lake	0917	No new nests or eagles.
Dogtown Lake nest site	0925	All known nests empty. No bald eagles.
Upper Lake Mary historic BA	1035	Ospreys active in nests #1, 2, 3, 4, 5. No bald eagles.
Ashurst Lake	1050	No new nests or eagles.
Kinnickinick Lake	1100	One adult in area. No new nests.
Tremaine/Long/Soldier Annex Lakes	1115	No new nests or eagles.
Blue Ridge Reservoir nest site	1130	Osprey active in nest #2. No eagles.
Chevelon Canyon Lake nest site	1200	Osprey active in nest #2. No eagles.
Willow Springs Lake nest site	1210	Ospreys active in nests #1, 4. No eagles.
Bear Canyon Lake nest site	1225	Ospreys active in nests # 1, 2. No eagles.
Knoll Lake nest site	1235	Osprey active in nest #1. No eagles.
June 3, 2011		
Granite Basin BA	0754	Failed. Nest empty and no eagles.
Lone Pine BA	0819	Three 9-10-week old nestlings.
Silver Creek BA	0840	Two 11-week old nestlings. One adult in area.
Silver Creek	0842	No new nests or eagles.

APPENDIX E: BARTLETT BREEDING AREA SUMMARY

Table 14. Observed human activity and bald eagle behavior, Bartlett BA, Arizona, 2011.

Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Helicopter	--	9	--	--	--	--	--	9	23.1
Canoe/kayak	2	5	--	--	--	--	--	7	17.9
Small plane	--	5	--	--	--	--	--	5	12.8
Helicopter, sheriff	1	3	--	--	--	--	--	4	10.3
OHV	--	3	--	--	--	--	--	3	7.7
Rafter	--	3	--	--	--	--	--	3	7.7
Hiker	1	1	--	--	--	--	--	2	5.1
Cyclist	1	--	--	--	--	--	--	1	2.6
Photographer	1	--	--	--	--	--	--	1	2.6
Helicopter, Apache	--	1	--	--	--	--	--	1	2.6
Helicopter, military	--	1	--	--	--	--	--	1	2.6
Jogger	1	--	--	--	--	--	--	1	2.6
Motorized parachute	--	--	--	1	--	--	--	1	2.6
Total	7	31	--	1	--	--	--	39	

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

Table 15. Observed forage events and success, Bartlett BA, Arizona, 2011.

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

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

Table 16. Observed prey types delivered to the nest, Bartlett BA, Arizona, 2011.

Sex	Fish	Mammals	Birds	Reptiles	Unknown	Total	Percent
Male	33	3	2	1	2	41	71.9
Female	12	2	1	--	1	16	28.1
Total	45	5	3	1	3	57	
Percent	78.9	8.8	5.3	1.8	5.3		

Table 17. Observed prey species delivered to the nest, Bartlett BA, Arizona 2011.

Sex	Fish				Mammals			Bird	Reptile	Total	Percent
	CS	CP	SU	BC	RS	GS	DC	WS	DS		
Male	4	1	2	1	--	1	1	--	1	11	78.6
Female	--	1	--	--	1	--	--	1	--	3	21.4
Total	4	2	2	1	1	1	1	1	1	14	
Percent	28.6	14.3	14.3	7.1	7.1	7.1	7.1	7.1	7.1		

[1]CS=catfish species, CP=common carp, SU=sucker species, BC=black crappie, RS=rock squirrel, GS=ground squirrel species, DC=desert cottontail, WS=waterfowl species, DS=desert spiny lizard.

Table 18. Bald eagle habitat analysis at the Bartlett BA, Arizona, 2011.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
34.9a	SH	Right	No	4	--	UP
34.9b	CT	Right	No	4	--	CL
34.9c	PV	Right	No	4	--	UP
34.9d	CF	Right	No	3	--	CL
34.9e	CF	Right	No	2	--	CL
34.9f	CF	Right	Yes	3	--	CL
34.9g	CF	Right	Yes	3	--	CL
35.0a	CF	Right	Yes	3	--	CL
35.0b	PT	Right	No	3	--	CL
35.0c	CF	Right	No	3	--	CL
35.0d	CT	Right	No	4	--	CL
35.0e	CT	Right	No	4	--	CL
35.1	SL	Right	No	2	--	CL

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff ledge, CT=cliff top, PT=pinnacle top, PV=palo verde, SH=shrub, SL=slope.
[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]n/a.
[5]CL=cliffs, UP=desert upland.

Table 19. Bald eagle habitat use at the Bartlett BA, Arizona, 2011.						
River km[1]	PW[2,3]	PP	PK	PV	Total	Percent
34.9	1,681	--	--	--	1,681	53.0
35.0	1,423	33	5	15	1,476	46.5
35.1	--	--	14	--	14	0.4
Total	3,104	33	19	15	3,171	
Percent	97.9	1.0	0.6	0.5		

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

APPENDIX F: BOX BAR BREEDING AREA SUMMARY

Table 20. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2011.

Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Small plane	7	4	--	--	--	--	1	12	24.5
Motorized parachute	1	4	--	--	--	--	5	10	20.4
Helicopter	4	5	--	--	--	--	--	9	12.2
OHV	3	--	--	--	1	--	1	5	10.2
Helicopter, Apache	--	1	--	--	1	1	--	3	6.1
Ultralight	2	1	--	--	--	--	--	3	6.1
Helicopter, sheriff	2	--	--	--	--	--	--	2	4.1
Fisherman	2	--	--	--	--	--	--	2	4.1
Rancher	1	--	--	--	--	--	--	1	2.0
Hiker	1	--	--	--	--	--	--	1	2.0
Camper	1	--	--	--	--	--	--	1	2.0
Total	24	15	--	--	2	1	7	49	

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

Table 21. Observed prey types delivered to the nest, Box Bar BA, Arizona, 2011.

Sex	Fish	Unknown	Total	Percent
Male	13	11	24	80.0
Female	3	1	4	13.3
Unknown	2	--	2	6.7
Total	18	12	30	
Percent	60.0	40.0		

Table 22. Bald eagle habitat analysis at the Box Bar BA, Arizona, 2011.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]
21.5	SS	Left	No	2	RI
22.0	HS	Right	No	1	RU
23.0	HS	Left	Partial	2	RU
23.8	CT	Left	Partial	1	RU
23.9	HS	Right	No	1	RI
25.0a	CL	Left	Yes	6	RU
25.0b	MS	Left	No	6	RU
25.0c	HS	Left	No	6	RU
25.0d	SS	Left	No	6	RU
25.0e	CL	Left	Yes	6	RU
25.0f	HS	Left	No	6	RU
25.0g	CM	Right	No	1	RI

[1]River kilometer (Hunt et. al. 1992).
[2]CL=cottonwood large/20-30m, CM=cottonwood medium/10-20m, CT=cliff top, HS=hard snag (main branches only), MS=mesquite, SS=soft snag (dead but branches still intact).
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]RI=riffle, RU=run.

Table 23. Bald eagle habitat use at the Box Bar BA, Arizona, 2011.									
River km[1]	PW[2,3]	PP	PH	PE	PD	PV	PU	Total	Percent
21.5	10	--	--	--	--	--	--	10	0.2
22.0	224	1	44	--	--	--	--	269	5.9
23.0	613	--	--	--	--	--	--	613	13.5
23.8	31	--	90	--	--	--	--	121	2.7
23.9	20	--	29	--	--	--	--	49	1.1
24.6	16	--	--	--	28	--	--	44	1.0
25.0	3,092	246	49	32	--	19	2	3,440	75.7
Total	4,006	247	212	32	28	19	2	4,546	
Percent	88.1	5.4	4.7	0.7	0.6	0.4	0.1		

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

APPENDIX G: CRESCENT BREEDING AREA SUMMARY

Table 24. Observed human activity and bald eagle behavior, Crescent BA, Arizona, 2011.								
Human Activity	N[1]	W	R	F	L	B	Total	Percent
Fisherman	569	--	--	--	--	--	569	67.7
Boat, fishing	118	--	--	--	--	--	118	14.0
Float tuber	72	--	--	--	--	--	72	8.6
Agency worker	26	--	2	--	--	--	28	3.3
Vehicle/Driver	12	--	--	--	--	--	12	1.4
Picnicker	11	--	--	--	--	--	11	1.3
Birdwatcher	10	--	--	--	--	--	10	1.2
Hiker	3	1	--	--	--	--	4	0.5
Small plane	3	--	--	--	1	--	4	0.5
Camper	3	--	--	--	--	--	3	0.4
Kayak/Canoe	2	--	--	--	--	--	2	0.2
Construction worker	2	--	--	--	--	--	2	0.2
Helicopter	2	--	--	--	--	--	2	0.2
Boater	1	--	--	--	--	--	1	0.1
OHV	1	--	--	--	--	--	1	0.1
Bicycler	--	--	1	--	--	--	1	0.1
Total	835	1	3	--	1	--	840	

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

Table 25. Observed forage events and success, Crescent BA, Arizona, 2011.								
Sex	Fish		Birds		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	30	28-2	11	11-0	2	2-0	43	41-2
Female	12	11-1	11	11-0	1	1-0	24	23-1
Total	42	39-3	22	22-0	3	3-0	67	64-3

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

Table 26. Observed prey types delivered to the nest, Crescent BA, Arizona, 2011.					
Sex	Fish	Birds	Unknown	Total	Percent
Male	28	11	1	40	63.5
Female	11	11	1	23	36.5
Total	39	22	2	63	
Percent	61.9	34.9	3.2		

Table 27. Observed prey species delivered to the nest, Crescent BA, Arizona 2011.							
Sex	Fish		Birds			Total	Percent
	RT[1]	CT	AC	CM	AW		
Male	26	2	9	--	--	37	67.3
Female	11	--	5	1	1	18	32.7
Total	37	2	14	1	1	55	
Percent	67.3	3.6	25.4	1.8	1.8		

[1]RT=rainbow trout, CT=Cutthroat trout, AC=American coot, CM=common merganser, AW=American widgeon.

Table 28. Bald eagle habitat analysis at the Crescent BA, Arizona, 2011.						
Perch Location[1]	Perch Type[2]	Side[3]	Shade	Distance to H_2O[4]	H_2O Type	Land Type[5]
2.0	PS	SW	Yes	6	--	CF
2.1a	PS	SW	Yes	4	--	CF
2.1b	PO	SW	No	7	--	CF
2.2a	PO	SW	Yes	8	--	CF
2.2b	HS	--	No	8	--	CF
2.3a	PO	NW	Yes	7	--	CF
2.3b	PO	NW	Yes	8	--	CF
2.4	SC	NW	No	8	--	CF
2.5	PO	NE	No	6	--	CF
2.6	PO	NE	Yes	3	--	CF

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

Table 29. Bald eagle habitat use at the Crescent BA, Arizona, 2011.

Lake km[1]	PW[2,3]	PR	PP	PU	SS	GM	DW	PK	OT	Total	Percent
0.3	--	--	--	--	--	--	3	--	--	3	0.1
0.4	--	--	--	--	--	2	3	--	--	5	0.1
0.6	--	--	--	--	25	6	4	--	--	35	0.2
0.7	--	--	--	--	--	3	--	--	--	3	0.1
1.2	--	--	--	--	--	2	--	--	--	2	0.1
1.7	--	--	--	--	4	4	--	--	--	8	0.1
1.9	--	--	--	--	6	4	10	--	--	20	0.1
2.0	33	--	--	--	7	6	5	--	18	69	0.3
2.1	1556	140	34	--	19	--	2	15	20	1,786	8.8
2.2	1952	543	67	--	--	--	--	9	--	2,571	12.7
2.2N	10,092	--	401	--	--	--	--	--	20	10,513	51.8
2.3	3937	528	131	--	--	--	--	--	--	4,596	22.7
2.4	167	218	21	79	8	--	2	--	--	495	2.4
2.5	74	--	--	--	--	--	--	--	--	74	0.4
2.6	105	--	--	--	--	--	--	--	--	105	0.5
2.7	--	--	--	--	--	4	--	--	--	4	0.1
Total	17,916	1,429	654	79	69	31	29	24	58	20,289	
Percent	88.3	7.0	3.2	0.4	0.3	0.2	0.1	0.1	0.3		

[1]Lake kilometer (clockwise from north boat ramp).
[2]Observation time (minutes).
[3]PW=perched watching, PR=perched roosting, PP=perched preening, PU=perched unknown, SS=standing on shore, GM=gathering nest material, DW=drinking water, PK=perched with prey, OT=other behaviors (includes perched close to mate, perched hunting, eating on shore, standing in water, and perched vocalizing).

APPENDIX H: GOLDFIELD BREEDING AREA SUMMARY

Table 30. Observed human activity and bald eagle behavior, Goldfield BA, Arizona, 2011.

Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Helicopter	3	3	--	1	--	--	1	8	47.1
Helicopter, Apache	1	2	--	--	--	--	--	3	17.6
Small plane	--	1	--	--	--	1	--	2	11.8
Hikers	--	1	--	1	--	--	--	2	11.8
Nestwatcher	--	--	--	--	1	-	--	1	5.9
Gunshot	--	--	--	1	--	--	--	1	5.9
Total	4	7	--	3	1	1	1	17	

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

Table 31. Bald eagle habitat analysis at the Goldfield BA, Arizona, 2011.

Perch Location[1]	Perch Type[2]	Side[3]	Shade	Distance to H_2O[4]	H_2O Type	Land Type
9.4	CL	Right	No	2	RU	--
9.6	CM	Right	No	1	RI	--
9.7	HS	Right	No	2	RU	--
9.9	CM	Right	No	2	RU	--
10.1	CM	Right	No	1	RU	--
10.2a	HS	Right	No	2	RU	--
10.2b	CM	Right	No	1	RU	--
10.2c	SM	Left	No	3	RU	--
10.3a	HS	Left	No	3	RU	--
10.3b	SS	Right	No	2	RU	--
10.4a	HS	Right	No	3	RU	--
10.4b	HS	Right	No	2	RU	--
10.4c	HS	Right	No	2	RU	--
10.9a	CT	Right	No	1	RB	--
10.9b	CL	Right	No	1	RB	--
10.9c	CF	Right	No	1	RB	--

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff ledge, CL=cottonwood large (20-30+m), CM=cottonwood medium (10-20+m), CT=cliff top, HS=hard snag (main branches only), SM=snag, mesquite, SS=soft snag (dead but branches still intact).
[3]1=0-25m, 2 =26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]RI=riffle, RU=run, RB=river bend

Table 32. Bald eagle habitat use at the Goldfield BA, Arizona, 2011.

River km[1]	PW[2,3]	PP	PE	PK	PH	PV	PI	Total	Percent
9.4	28	--	--	--	--	--	--	28	1.7
9.6	34	--	--	--	--	--	--	34	2.1
9.7	14	--	--	--	--	--	--	14	0.9
9.9	94	46	--	--	--	--	--	140	8.5
10.1	11	--	--	--	--	--	--	11	0.7
10.2	308	155	12	--	--	1	--	476	29.1
10.3	275	--	186	54	--	--	3	518	31.6
10.4	128	60	--	3	--	9	--	200	12.2
10.9	194	--	--	--	23	--	--	217	13.2
Total	1,086	261	198	57	23	10	3	1,638	
Percent	66.3	15.9	12.1	3.5	1.4	0.6	0.2		

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

APPENDIX I: GRANITE REEF BREEDING AREA SUMMARY

Table 33. Observed human activity and bald eagle behavior, Granite Reef BA, Arizona 2011.

Human Activity	N[1]	W	R	F	L	X	B	U	Total	Percent
Driver	45	7	--	1	--	--	3	2	58	28.9
Canoe/Kayak	26	6	--	1	--	--	8	10	51	25.4
Agency Worker	2	3	--	--	--	--	5	18	28	13.9
Helicopter, Apache	5	6	--	--	--	--	--	3	14	7.0
Rafter	2	--	--	--	--	--	2	6	10	5.0
Hiker	6	1	--	--	--	--	1	--	8	4.0
Helicopter	6	2	--	--	--	--	--	--	8	4.0
Picnicker	1	--	--	--	--	--	1	3	5	2.5
Fisherman	3	--	--	1	--	--	--	1	4	2.0
Nestwatcher	--	--	2	--	--	1	--	--	3	1.5
Boater	--	1	--	1	--	--	--	--	2	1.0
Gunshot	--	--	--	2	--	--	--	--	2	1.0
AGFD researcher	--	--	--	--	--	1	--	--	1	0.5
OHV	--	--	--	--	1	--	--	--	1	0.5
Rancher	1	--	--	--	--	--	--	--	1	0.5
Swimmer	--	--	--	--	1	--	--	--	1	0.5
Photographer	--	1	--	--	--	--	--	--	1	0.5
Tuber	--	--	--	1	--	--	--	--	1	0.5
Woodcutter	1	--	--	--	--	--	--	--	1	0.5
Total	98	27	2	7	2	2	20	43	201	

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

Table 34. Bald eagle habitat analysis at the Granite Reef BA, Arizona, 2011 (continued next page).

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
1.0	CL	Right	No	1	PO	CW
1.5	CL	Right	Partial	1	PO	CW
2.5	SG	Right	No	--	--	MB
2.7a	CL	Left	No	1	RI	CW
2.7b	CL	Right	No	1	RI	WT
2.8	TX	Right	Partial	3	RI	WT
2.9a	ST	Left	Partial	2	RI	WT
2.9b	CL	Left	Partial	--	--	CW
3.0a	CL	Right	Partial	3	RI	WT
3.0b	CL	Right	Partial	3	RI	WT
3.0c	CL	Left	No	2	RI	WT
3.0d	CL	Right	Partial	2	RI	WT
3.0e	ST	Left	No	1	RI	WT
3.0f	CL	Left	No	1	RI	CW

[1]River kilometer (Hunt et. al. 1992).
[2]CL=cottonwood large (20-30+m), MS=mesquite tree, SG=soft snag (dead but branches still intact), ST=snag top, TX=tamarisk.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]PO=pool, RI=riffle, run.
[5]CW=cottonwood grove, MB=mesquite bosque, TX=tamarisk thicket, WT=willow thicket.

Table 34 continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
3.0g	CL	Right	Partial	3	RI	WT
3.0h	CL	Left	No	--	--	CW
3.0i	CL	Right	Partial	5	RI	WT
3.0j	CL	Left	No	1	RI	WT
3.0k	CL	Left	Yes	2	RI	WT
3.0l	ST	Left	No	2	RI	WT
3.0m	ST	Left	No	2	RI	TX
3.1a	ST	Left	Partial	3	--	TX
3.1b	CL	Left	Partial	3	RI	CW
3.1c	ST	Left	No	--	--	WT
3.1d	MS	Left	No	1	RI	TX
3.4a	MS	Left	No	1	RI	WT
3.4b	CL	Left	No	3	--	MB
3.5a	CL	Left	No	--	--	CW
3.5b	SG	Left	Yes	3	--	WT
3.5c	CL	Left	Partial	5	--	MB
3.5d	ST	Left	No	2	--	MB
3.5e	CL	Left	No	3	--	MB
3.6a	SG	Left	No	5	--	CW
3.6b	SG	Left	No	1	RU	CW
3.7a	SG	Left	Partial	1	RU	WT
3.7b	SG	Left	No	5	--	CW
3.7c	CL	Left	Partial	3	RI	WT
3.7d	CL	Left	No	1	--	TX
3.7e	SG	Left	No	1	--	CW
3.7f	SG	Left	No	--	--	CW
3.8a	SG	Left	No	1	--	TX
3.8b	ST	Left	No	3	--	CW
3.8c	SG	Left	No	3	--	WT

[1]River kilometer (Hunt et. al. 1992).
[2]CL=cottonwood large (20-30+m), MS=mesquite tree, SG=soft snag (dead but branches still intact), ST=snag top, TX=tamarisk.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]PO=pool, RI=riffle, run.
[5]CW=cottonwood grove, MB=mesquite bosque, TX=tamarisk thicket, WT=willow thicket.

Table 35. Bald eagle habitat use at the Granite Reef BA, Arizona, 2011.

River km[1]	PW[2,3]	PX	PH	PU	CL	VX	PP	OT	Total	Percent
1.0	--	--	11	--	--	--	--	--	11	0.1
1.5	--	--	--	--	13	--	--	--	13	0.1
2.5	--	--	19	--	--	--	--	--	19	0.1
2.7	58	--	--	--	--	--	--	--	58	0.4
2.8	--	81	--	--	--	--	--	--	81	0.6
2.9	10	--	331	--	--	--	--	3	344	2.5
3.0	5,538	2,267	1,805	2,029	320	286	255	251	12,751	91.2
3.1	9	--	--	6	--	--	--	--	15	0.1
3.4	27	--	48	--	--	--	--	2	77	0.6
3.5	53	--	--	--	--	--	--	4	57	0.4
3.6	135	--	--	--	--	--	--	--	135	1.0
3.7	12	--	151	173	--	--	--	--	336	2.4
3.8	30	56	--	--	--	--	--	--	86	0.6
Total	5,872	2,404	2,365	2,208	333	286	255	260	13,983	
Percent	42.0	17.2	16.9	15.8	2.4	2.0	1.8	1.8		

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, PX=perched various, PH=perched hunting, PU=perched unknown, CL=perched close to mate, VX=various activities, PP=perched preening, OT=other (includes perched eating, perched vocalizing, weird behavior, perched interaction, and perched on ground).

APPENDIX J: LADDERS BREEDING AREA SUMMARY

Table 36. Observed human activity and bald eagle behavior, Ladders BA, Arizona, 2011.									
Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Canoe/kayak	88	208	--	--	--	14	--	310	78.5%
Rafter	5	24	--	--	--	--	--	29	7.3%
Helicopter	8	14	--	1	--	3	--	26	6.6%
Small Plane	3	8	--	--	--	2	--	13	3.3%
Military helicopter	2	3	--	--	--	--	--	5	1.3%
Cattle ranchers	3	--	--	--	--	1	--	4	1.0%
Agency worker	2	--	--	1	--	--	--	3	0.8%
OHV	1	--	--	--	--	1	--	2	0.5%
Hiker	--	2	--	--	--	--	--	2	0.5%
Gunshot	1	--	--	--	--	--	--	1	0.2%
Total	113	259	--	2	--	21	--	395	

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

Table 37. Observed forage events and success, Ladders BA, Arizona, 2011.						
Sex	Fish		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	4	3-1	2	2-0	6	5-1
Female	6	5-1	1	1-0	7	6-1
Total	10	8-2	3	3-0	13	11-2

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

Table 38. Observed prey types delivered to the nest, Ladders BA, Arizona, 2011.					
Sex	Fish	Mammals	Unknown	Total	Percent
Male	16	11	16	43	70.5
Female	14	--	4	18	29.5
Total	30	11	20	61	
Percent	49.2	18.0	32.8		

Table 39. Observed prey species delivered to the nest, Ladders BA, Arizona 2011.								
Sex	Fish			Mammals			Total	Percent
	SU[1]	CP	CS	DC	WR	RS		
Male	14	1	1	9	1	1	25	64.1
Female	9	5	--	--	--	--	14	35.9
Total	23	6	1	9	1	1	39	
Percent	58.9	15.4	2.6	23.1	2.6	2.6		

[1]SU= sucker species, CP=common carp, CS=catfish species, DC=desert cottontail, WR=woodrat species, RS=rabbit species.

Table 40. Bald eagle habitat analysis at the Ladders BA, Arizona, 2011 (continued next page).

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
161.0	JN	Right	No	2	PO	UP
161.5	JN	Right	No	2	RI	UP
161.6	SJ	Right	Yes	2	RI	UP
161.7	JN	Right	No	3	RI	UP
162.0	LG	Right	P	4	RI	UP
162.1a	JN	Right	Yes	3	RI	UP
162.1b	JN	Right	Yes	2	RI	UP
162.1c	SJ	Right	Yes	3	RI	UP
162.2a	SJ	Right	No	2	RI	UP
162.2b	JN	Right	No	4	RI	UP
162.2c	SJ	Right	Yes	3	RI	UP
162.2d	CF	Left	Yes	2	PO	CL
162.2e	SJ	Right	No	3	RI	UP
162.2f	SJ	Right	No	3	RI	UP
162.2g	SJ	Right	Yes	3	RI	CL
162.2h	JN	Right	No	3	RI	UP
162.2i	SJ	Right	Yes	4	RI	UP
162.2j	PS	Right	No	3	RI	UP
162.2k	AN	Right	Yes	3	RI	CL
162.2l	SJ	Right	Yes	2	RI	UP
162.3a	SJ	Right	Yes	3	RI	UP
162.3b	JN	Right	No	3	RU	UP
162.3c	CT	Right	No	4	RU	UP
162.3d	CT	Right	No	2	RU	CL
162.3e	CF	Right	Yes	2	RI	CL
162.4a	CT	Right	No	2	RI	UP
162.4b	JN	Right	Yes	4	RI	UP
162.5a	SJ	Right	P	2	RI	UP
162.5b	CF	Right	Yes	2	RI	UP
162.5c	ID	Left	No	1	PO	SO
162.5d	JN	Right	Yes	1	RI	UP
162.5e	SJ	Right	Yes	2	RI	UP
162.5f	SJ	Right	Yes	2	PO	UP
162.5g	JN	Right	No	2	RI	UP
162.6a	JN	Right	No	2	RI	UP
162.6b	SJ	Left	No	2	PO	UP
162.6c	SO	Left	No	1	PO	SO
162.7a	BO	Right	No	1	PO	UP
162.7b	SJ	Right	No	8	--	--
162.7c	SC	Right	No	3	RI	UP
162.7d	JN	Left	Yes	3	PO	UP
162.7	CT	Left	Yes	3	PO	UP
162.7	SO	Left	No	1	PO	UP

[1]River kilometer (Hunt et. al. 1992).
[2]AN=alternate nest, BO=boulder, CF=cliff ledge, CT=cliff top, ID=island, JN=juniper, LG=log, PS=pine/conifer 2nd growth, SC=snag conifer, SJ=snag juniper, SO=shore.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]PO=pool, RI=riffle, RU=run.
[5]CL=cliffs, SO=shore, UP=upland desert.

Table 40 continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
162.7	BO	Left	No	2	PO	UP
162.7	SJ	Left	No	5	PO	UP
162.7	CT	Left	Partial	2	PO	UP
162.7	BO	Right	No	2	PO	UP
162.7	CT	Right	No	2	PO	UP
162.8	JN	Left	No	3	PO	UP
162.8	CT	Left	Partial	3	PO	UP
162.8	SO	Right	No	1	PO	SO
162.8	CF	Left	No	2	PO	UP
162.8	CF	Left	Yes	2	PO	CL
162.8	JN	Left	Yes	3	PO	UP
162.9	JN	Right	No	3	PO	UP
162.9	JN	Left	Yes	3	PO	UP
162.9	CT	Right	No	3	PO	UP
162.9	CT	Right	No	2	PO	UP
162.9	CT	Left	No	2	PO	UP
162.9	CF	Left	Yes	2	PO	UP
162.9	CF	Left	Yes	2	PO	CL
162.9	CT	Left	No	3	PO	UP
162.9	CT	Right	No	2	PO	CL
162.9	JN	Left	Yes	3	PO	UP
162.9	SO	Left	No	1	PO	SO
162.9	CF	Right	No	2	PO	CL
162.9	RW	Left	No	1	PO	SO
163.0	SJ	Left	No	4	PO	UP
163.0	SJ	Left	Yes	2	PO	UP
163.0	CF	Left	Yes	2	PO	CL
163.0	CF	Left	Yes	1	PO	CL
163.1	JN	Left	No	3	RI	UP
163.2	CT	Left	No	2	RI	UP
163.4	CT	Left	No	3	PO	UP
163.5	CT	Right	No	3	RI	CL

[1]River kilometer (Hunt et. al. 1992).
[2]BO=boulder, CF=cliff ledge, CT=cliff top, JN=juniper, RW=rock in water, SJ=snag juniper, SO=shore.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]PO=pool, RI=riffle.
[5]CL=cliffs, SO=shore, UP=upland desert.

Table 41. Bald eagle habitat use at the Ladders BA, Arizona, 2011.										
River km[1]	PW[2,3]	PH	PP	SS	DW	SH	PG	PV	Total	Percent
161.0	20	--	--	--	--	--	--	--	20	0.2
161.5	23	--	--	--	--	--	--	--	23	0.2
161.6	8	--	--	--	--	--	--	--	8	0.1
161.7	50	246	61	--	--	--	--	--	357	3.6
162.0	2	--	--	--	--	--	--	--	2	0.1
162.1	73	253	44	--	--	--	--	--	370	3.7
162.2	3,249	126	69	--	--	--	--	--	3,444	34.5
162.3	850	34	21	--	--	--	--	8	913	9.2
162.4	109	9	--	--	--	--	--	--	118	1.2
162.5	102	82	26	40	2	--	10	--	262	2.6
162.6	66	74	16	--	11	--	--	--	167	1.7
162.7	351	--	10	3	2	--	--	--	366	3.7
162.8	1,956	15	137	4	7	20	--	2	2,141	21.5
162.9	1,202	75	38	18	23	--	--	--	1,356	13.6
163.0	234	52	90	--	--	--	--	--	376	3.8
163.1	4	--	--	--	--	--	--	--	4	0.1
163.2	14	--	--	--	--	--	--	--	14	0.1
163.4	18	--	--	--	--	--	--	--	18	0.2
163.5	21	--	--	--	--	--	--	--	21	0.2
Total	8,352	966	512	65	45	20	10	10	9,980	
Percent	83.7	9.7	5.1	0.7	0.5	0.2	0.1	0.1		

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, PP=perched preening, SS=standing on shore, DW=drinking water, SH=standing in water, PG=perched on ground, PV=perched vocalizing.

APPENDIX K: NEEDLE ROCK BREEDING AREA SUMMARY

Table 42. Observed human activity and bald eagle behavior, Needle Rock BA, Arizona, 2011.

Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Helicopter	6	2	1	--	--	1	4	14	28.6
Nestwatcher	--	--	1	4	1	--	--	6	12.2
OHV	--	2	1	--	2	--	--	5	10.2
Paraglider, powered	3	1	--	--		--	--	4	8.2
Driver	--	--	--	--	3	--	--	3	6.1
Small plane	2	1	--	--		--	--	3	6.1
Canoe/Kayak	--	--	--	--	2	--	--	2	4.1
Helicopter, sheriff	2	--	--	--	--	--	--	2	4.1
Camper	--	--	--	--	--	2	--	2	4.1
Helicopter, military	--	--	1	--	--	--	--	1	2.0
Ultralight	1	--	--	--	--	--	--	1	2.0
Military jet	1	--	--	--	--	--	--	1	2.0
Shooter	--	1	--	--		--	--	1	2.0
Hiker	--	--	--	--	1	--	--	1	2.0
Birdwatcher	--	--	--	--	1	--	--	1	2.0
Horseback rider	--	--	--	--	--	1	--	1	2.0
Vehicle	--	1	--	--	--	--	--	1	2.0
Total	15	8	4	4	10	4	4	49	

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

Table 43. Observed forage events and success, Needle Rock BA, Arizona, 2011.

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

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

Table 44. Observed prey types delivered to the nest, Needle Rock BA, Arizona, 2011.

Sex	Fish	Unknown	Total	Percent
Male	2	5	7	50.0
Female	3	2	5	35.7
Unknown	1	1	2	14.3
Total	6	8	14	
Percent	42.9	57.1		

Table 45. Bald eagle habitat analysis at the Needle Rock BA, Arizona, 2011 (continued next page).

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
25.2	SG	Right	No	2	RU	TX
25.3	SG	Right	No	2	RU	TX
25.5a	ST	Right	No	2	RI	TX
25.5b	HS	Left	No	6	RU	MB
25.5c	CL	Right	Yes	5	RU	MB
25.6	CL	Right	No	5	RU	TX
25.7	CL	Right	Yes	6	RB	MB
25.8	CL	Right	Partial	5	RU	CW
25.9a	WO	Left	Partial	1	RI	WT
25.9b	SM	Left	No	1	RU	WT
26.0a	ST	Left	No	4	RU	MB
26.0b	SM	Left	No	8	--	MB
26.0c	MS	Right	No	8	--	UP
26.0d	SM	Left	No	5	RU	MB
26.1a	SM	Left	No	8	--	MB
Nest Tree	YL	Left	Partial	8	RU	MB
26.1b	SM	Left	No	4	RU	MB
26.1c	CL	Left	Yes	4	RU	MB
26.2a	CL	Left	Partial	1	RU	MB
26.2b	SM	Left	No	8	RU	MB
26.2c	SO	Right	Partial	1	RU	--
26.3a	WO	Left	No	1	RU	WT
26.3b	WO	Right	No	1	RU	WT
26.3c	SM	Left	No	5	RU	MB
26.4	ST	Left	No	1	RU	WT
26.5a	SO	Right	Partial	1	RU	WT
26.5b	CL	Left	Partial	2	RU	CW
26.6	CL	Left	Yes	2	RU	CW
26.7a	ST	Right	No	5	RI	CW
26.7b	SM	Left	No	8	RU	MB
26.7c	SM	Left	No	6	RU	MB
26.9	SM	Left	No	7	--	MB
27.0a	WO	Right	No	1	RU	WT
27.0b	WO	Left	Partial	1	RU	WT
27.0c	ST	Left	No	7	--	MB
27.1a	WO	Left	Partial	1	RI	WT
27.1b	WO	Left	Yes	1	RI	WT
27.2	SO	Right	Yes	1	RB	SO
27.3	SG	Right	No	1	RU	WT

[1]River kilometer (Hunt et. al. 1992).
[2]BO=boulder, CL=cottonwood large/20-30m, HS=hard snag (main branches only), MS=mesquite, SG=soft snag, SM=snag mesquite, SO=shore, ST=snag top, WO=willow, YL=Sycamore.
[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.
[5]MB=mesquite bosque, CW=cottonwood grove, SO=shore, TX=tamarisk thicket, UP=desert upland, WT=willow thicket.

Table 45 continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
27.4	WO	Left	Partial	1	RU	WT
27.5	SG	Right	Partial	1	RU	WT
27.6	SG	Right	Partial	1	RU	WT
28.0	MS	Left	Partial	8	--	MB
28.2a	WO	Right	Partial	1	RU	WT
28.2b	WO	Left	No	1	RB	WT
28.2c	WO	Left	Partial	1	RU	WT
28.2d	WO	Left	No	1	RB	WT
28.2e	WO	Left	Yes	1	RU	WT
28.2f	WO	Right	Yes	1	RU	WT
28.3	SG	Left	Partial	1	RU	WT
28.8	SG	Left	No	1	RU	WT
29.0	HS	Left	No	1	RU	WT
29.4	BO	Right	No	1	RU	WT

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

[2]BO=boulder, CL=cottonwood large/20-30m, HS=hard snag (main branches only), MS=mesquite, SG=soft snag (dead but with branches still intact), SM=snag mesquite, SO=shore, ST=snag top, WO=willow, YL= sycamore large/10-20+m.

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

[4]RI=riffle, RU=run, RB=river bend.

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

Table 46. Bald eagle habitat use at the Needle Rock BA, Arizona, 2011.

River km[1]	PW[2,3]	PP	PR	PH	CL	PD	PE	PU	PV	SS	PI	Total	Percent
25.2	--	--	--	--	1	--	--	--	1	--	--	2	0.1
25.3	70	15	--	--	1	--	--	--	--	--	--	86	1.3
25.5	550	7	9	--	--	--	--	4	--	--	--	570	8.4
25.6	36	--	--	--	--	--	--	--	1	--	--	37	0.5
25.7	--	--	--	--	58	--	--	--	3	--	--	61	0.9
25.8	--	--	--	--	--	--	--	1	--	--	--	1	0.1
25.9	23	--	--	--	--	--	--	--	4	--	--	27	0.4
26.0	843	259	--	9	--	19	6	1	--	--	--	1,137	16.7
26.1	1,588	153	312	--	36	11	--	5	4	--	--	2,109	31.0
26.2	78	55	--	3	--	--	--	--	3	6	--	145	2.1
26.3	--	--	--	15	--	--	--	--	--	--	--	15	0.2
26.4	173	33	--	--	--	--	--	--	1	--	--	207	3.0
26.5	52	--	--	--	4	--	--	--	--	1	--	57	0.8
26.6	55	--	--	--	--	--	--	--	1	--	--	56	0.8
26.7	473	7	--	--	6	1	--	--	8	--	--	495	7.3
26.8	3	5	--	--	--	--	--	--	--	--	--	8	0.1
26.9	42	--	--	--	--	--	--	--	--	--	1	43	0.6
27.0	108	--	--	32	--	--	--	--	--	--	--	140	2.1
27.1	14	--	--	--	--	--	--	--	--	--	--	14	0.2
27.2	--	--	--	--	--	--	--	--	--	2	--	2	0.1
27.3	38	--	--	--	--	--	--	--	--	--	--	38	0.6
27.4	6	--	--	--	--	--	--	--	--	--	--	6	0.1
27.5	3	--	--	--	--	--	--	--	--	--	--	3	0.1
27.6	44	5	--	--	--	--	--	--	--	--	--	49	0.7
28.0	--	--	--	--	--	--	--	3	--	--	--	3	0.1
28.2	392	--	9	74	--	27	--	17	1	--	--	520	7.6
28.3	98	4	--	28	--	--	--	--	1	--	--	131	1.9
28.8	24	5	--	10	--	--	--	--	--	--	--	39	0.6
29.0	3	--	--	--	--	--	--	--	--	--	--	3	0.1
29.4	305	65	38	--	--	--	--	--	--	--	1	409	6.0
Nest	307	20	8	--	--	--	42	16	--	--	--	393	5.8
Total	5,328	633	376	171	106	58	48	47	28	9	2	6,806	
Percent	78.3	9.3	5.5	2.5	1.6	0.9	0.7	0.7	0.4	0.1	0.1		

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

[2]Observation time (minutes).

[3]PW=perched watching, PP=perched preening, PR=perched roosting, PH=perched hunting, CL=perched close to mate, PD=perched drying, PE=perched eating, PU=perched unknown, PV=perched vocalizing, SS=standing on shore, PI=perched interaction.

APPENDIX L: ORME BREEDING AREA SUMMARY

Table 47. Observed human activity and bald eagle behavior, Orme BA, Arizona 2011.										
Human Activity	N[1]	W	R	F	L	X	B	U	Total	Percent
Driver	20	1	--	--	2	--	--	10	33	19.3
Agency worker	20	1	--	2	1	2	--	--	26	15.2
Hiker	15	3	--	--	--	--	--	2	20	11.7
Vehicle	12	1	--	1	2	--	--	--	16	9.4
Horseback rider	5	3	--	--	--	--	--	--	8	4.7
Nestwatcher	--	3	--	3	--		--	--	6	3.5
Fisherman	4	1	--	--	--	1	--	--	6	3.5
Picnicker	6	--	--	--	--	--	--	--	6	3.5
Helicopter, Apache	1	5	--	--	--	--	--	--	6	3.5
Helicopter	2	2	--	--	1	1	--	--	6	3.5
Water plant alarm	4	--	--	--	1	--	--	--	5	2.9
Kayak/canoe	3	2	--	--	--	--	--	--	5	2.9
Construction	4	--	--	--	--	--	--	1	5	2.9
Camper	2	2	--	--	--	--	--	--	4	2.3
AGFD researcher	--	--	--	--	--	3			3	1.8
Rafter	2	--	--	--	--	--	--	1	3	1.8
Rancher	--	--	--	--	1	--	--	1	2	1.2
Large truck	--	2	--	--	--	--	--	--	2	1.2
Helicopter, Sheriff	--	--	--	--	--	--	--	2	2	1.2
Swimmer	1	--	--	--	--	--	--	--	1	0.6
Ultralight	1	--	--	--	--	--	--	--	1	0.6
Small plane	1	--	--	--	--	--	--	--	1	0.6
Helicopter, Other military	1	--	--	--	--	--	--	--	1	0.6
Photographer	1	--	--	--	--	--	--	--	1	0.6
Shooter	--	1	--	--	--	--	--	--	1	0.6
Explosion	--	--	--	1	--	--	--	--	1	0.6
Total	105	27	--	7	8	7	--	17	171	

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

Table 48. Observed forage events and success, Orme BA, Arizona, 2011.						
Sex	Fish		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	1	1-0	4	3-1	5	4-1
Female	1	1-0	--	--	1	1-0
Total	2	2-0	4	3-1	6	5-1

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

Table 49. Observed prey types delivered to the nest, Orme BA, Arizona, 2011.					
Sex	Fish	Mammals	Unknown	Total	Percent
Male	4	1	9	14	58.3
Female	8	--	--	8	33.3
Unknown	--	--	2	2	8.3
Total	12	1	11	24	
Percent	50.0	4.2	45.8		

Table 50. Observed prey species delivered to the nest, Orme BA, Arizona 2011.					
Sex	Fish		Mammals	Total	Percent
	SU[1]	RT	RS		
Male	1	1	1	3	60.0
Female	2	--	--	2	40.0
Total	3	1	1	5	
Percent	60.0	20.0	20.0		

[1]SU=sucker species, RT=rainbow trout, RS=rabbit species.

Table 51. Bald eagle habitat analysis at the Orme BA, Arizona, 2011 (continued next page).						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
V 0.2	ST	Right	Yes	1	PW	UP
V 0.3a	ST	Right	Partial	4	--	WT
V 0.3b	CM	Right	No	3	--	CW
V 0.3c	CS	Right	No	2	--	--
V 0.3d	CL	Right	No	2	RI	WT
V 0.3e	CM	Right	No	4	--	TX
V 0.3f	SG	Right	Yes	3	--	CW
V 0.4a	CL	Right	No	4	--	CW
V 0.4b	CL	Right	No	5	--	CW
V 0.4c	SB	Right	No	2	--	SB
V 0.4d	SG	Right	Yes	4	--	CW
V 0.4e	SG	Right	Yes	4	--	CW
V 0.5a	SM	Left	No	1	PW	MB
V 0.5b	SG	Left	No	1	PO	MB
V 0.6a	CL	Right	No	1	--	CW
V 0.6b	SM	Left	No	1	PO	MB
V 0.6c	CM	Left	No	1	PO	WT
V 0.7a	SG	Right	No	1	PO	CW
V 0.7b	SM	Left	No	1	PO	MB
V 0.7c	SM	Left	No	1	RI	MB
V 0.7d	CL	Right	No	1	--	--
V 0.7e	SM	Left	No	1	--	MB
V 0.7f	SM	Left	No	1	PO	MB
V 0.7g	SM	Left	No	1	--	MB
V 0.7h	SM	Left	No	1	PO	MB
V 0.7i	CL	Right	No	1	PO	WT
V 0.7j	CL	Right	No	1	PW	WT
V 0.7k	CL	Right	No	1	PN	CW
V 0.8a	CL	Right	No	1	PW	CW
V 0.8b	CL	Right	No	1	PO	WT

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

[2]BO=boulder, CF=cliff ledge, CL=cottonwood large (20-30+m), CM=cottonwood medium (10-20m), CS=small cottonwood (0-10m), DL=deciduous large (10-20+m), HL=hillside, MS=mesquite tree, SB=sandbar, SG=soft snag (dead but branches still intact), SH=shrub, SM=snag, mesquite, SO=shore, ST=snag top, YL=sycamore large (10-20+m), YM=sycamore medium (5-10m).

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

[4]PO=pool, PN=pond, PW=pocket water, RB=river bend, RI=riffle.

[5]CW=cottonwood grove, MB=mesquite bosque, SB=sand bar, TX=tamarisk thicket, UP=desert upland, WT=willow thicket.

Table 51 (continued).

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
V 0.8c	CL	Right	No	1	PW	WT
V 0.8d	CL	Left	No	1	PO	CW
V 0.8e	SM	Left	No	1	PO	WT
V 0.8f	SM	Left	No	2	--	MB
V 0.8g	DL	Left	No	1	PO	MB
V 1.0a	SO	Left	No	1	PO	WT
V 1.0b	MS	Left	No	6	--	MB
V 1.0c	CM	Left	No	1	PO	CW
V 1.0d	DW	--	No	--	PO	--
V 1.2	SM	Left	No	1	--	MB
S 4.5a	CL	Right	No	1	PO	WT
S 4.5b	CL	Left	No	1	RI	CW
S 4.7a	CM	Right	No	1	PW	WT
S 4.7b	YM	Right	No	1	--	WT
S 5.0a	CM	Right	No	5	PO	UP
S 5.0b	SG	Right	No	5	PO	MB
S 5.0c	CM	Right	Partial	1	PW	WT
S 5.0d	YM	Right	No	1	RI	WT
S 5.0e	SG	Left	No	1	RI	WT
S 5.0f	CM	Right	No	1	RI	WT
S 5.1	YM	Right	No	2	RI	WT
S 5.2a	YL	Right	No	1	RI	WT
S 5.2b	SM	Right	Partial	1	PO	WT
S 5.6	ST	Left	Yes	1	PW	UP
S 5.7a	SG	Right	No	5	PO	MB
S 5.7b	CM	Right	No	5	PO	UP
S 5.8	SG	Left	Partial	1	RI	UP
S 6.4	CM	Right	No	2	PW	WT
S 6.5a	SG	Right	No	--	RI	WT
S 6.5b	SG	Right	No	4	RI	WT
S 6.5c	CL	Right	No	1	--	CW
S 6.5d	CF	Left	No	1	--	UP
S 6.5e	CF	Left	No	1	PW	--
S 7.0a	SG	Right	No	--	--	WT
S 7.0b	SG	Right	No	1	--	WT
S 7.2	CL	Right	No	2	--	CW
S 7.5a	CL	Right	No	4	--	CW
S 7.5b	CL	Right	No	4	--	CW
S 7.5c	CL	Right	No	2	--	WT

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

[2]BO=boulder, CF=cliff ledge, CL=cottonwood large (20-30+m), CM=cottonwood medium (10-20m), CS=small cottonwood (0-10m), DL=deciduous large (10-20+m), HL=hillside, MS=mesquite tree, SB=sandbar, SG=soft snag (dead but branches still intact), SH=shrub, SM=snag, mesquite, SO=shore, ST=snag top, YL=sycamore large (10-20+m), YM=sycamore medium (5-10m).

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

[4]PO=pool, PN=pond, PW=pocket water, RB=river bend, RI=riffle.

[5]CW=cottonwood grove, MB=mesquite bosque, SB=sand bar, TX=tamarisk thicket, UP=desert upland, WT=willow thicket.

Table 51 (continued).

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
S 8.5a	CL	Right	No	--	--	CW
S 8.5b	CL	Right	No	8	--	CW
S 8.5c	CL	Left	Yes	2	--	CW
S 9.0a	SG	Left	No	1	--	WT
S 9.0b	CL	Left	No	1	--	CW
S 9.0c	SG	--	--	--	--	CW
S 9.0d	DL	Left	Yes	--	--	MB
S 999a	HL	Left	No	4	--	UP
S 999b	SH	Left	No	7	--	UP
S 999c	BO	Left	No	7	--	UP
S999d	SG	--	--	--	--	UP

[1]River kilometer (Hunt et. al. 1992). S=Salt River. 999=undetermined river kilometer (perched away from river).

[2]BO=boulder, CF=cliff ledge, CL=cottonwood large (20-30+m), CM=cottonwood medium (10-20m), CS=small cottonwood (0-10m), DL=deciduous large (10-20+m), HL=hillside, MS=mesquite tree, SB=sandbar, SG=soft snag (dead but branches still intact), SH=shrub, SM=snag, mesquite, SO=shore, ST=snag top, YL=sycamore large (10-20+m), YM=sycamore medium (5-10m).

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

[4]PO=pool, PN=pond, PW=pocket water, RB=river bend, RI=riffle.

[5]CW=cottonwood grove, MB=mesquite bosque, SB=sand bar, TX=tamarisk thicket, UP=desert upland, WT=willow thicket.

Table 52. Bald eagle habitat use at the Orme BA, Arizona, 2011.

River km[1]	PW[2,3]	PH	PX	PP	PD	PU	PK	PV	PE	OT	Total	Percent
0.2 V	594	--	18	--	10	46	--	--	--	--	668	4.3
0.3 V	5,119	58	2,049	732	198	169	36	9	5	2	8,377	53.7
0.4 V	134	23	86	46	--	1	--	4	--	--	294	1.9
0.5 V	7	26	1	--	--	--	--	--	--	1	35	0.2
0.6 V	47	141	148	--	28	--	--	--	--	2	366	2.3
0.7 V	742	1,271	415	53	195	--	--	8	--	6	2,690	17.3
0.8 V	80	343	144	1	11	--	--	--	--	4	583	3.7
0.9 V	--	--	--	--	--	--	--	5	--	--	5	0.1
1.0 V	4	6	3	--	--	--	--	18	--	15	46	0.3
1.1 V	--	235	--	--	--	--	--	--	--	--	235	1.5
1.2 V	18	--	--	--	--	--	--	--	--	--	18	0.1
1.3 V	--	--	--	--	--	--	--	--	--	--	0	0.1
1.4 V	--	3	--	--	--	--	--	1	--	--	4	0.1
4.5 S	76	36	--	--	--	--	--	--	--	--	112	0.7
4.6 S	--	24	--	--	--	--	--	--	--	--	24	0.2
4.7 S	6	12	--	--	--	--	--	--	--	--	18	0.1
5.0 S	45	39	8	9	9	1	--	--	--	--	111	0.7
5.1 S	4	2	--	--	--	--	--	--	--	--	6	0.1
5.2 S	--	5	20	--	--	12	--	--	--	--	37	0.2
5.3 S	7	--	--	--	--	--	--	--	--	--	7	0.1
5.6 S	--	37	--	--	1	--	3	--	--	--	41	0.3
5.7 S	--	16	1	--	--	--	--	--	--	--	17	0.1
5.8 S	--	46	33	--	--	--	8	--	--	--	87	0.6
6.3 S	--	27		--	--	--	--	--	--	--	27	0.2
6.5 S	256	225	92	--	--	--	2	--	13	--	588	3.8
6.7 S	32		--	--	--	--	--	--	--	--	32	0.2
6.8 S	--	13	--	--	--	--	--	--	--	--	13	0.1
7.0 S	25	117	7	--	--	--	--	--	--	--	149	1.0
7.2 S	30	23	--	--	--	--	1	--	17	--	71	0.5
7.5 S	305	26	--	--	--	--	--	--	--	3	334	2.1
7.7 S	1	--	--	--	--	--	--	--	--	--	1	0.1
8.0 S	--	22	--	--	--	--	--	--	--	--	22	0.1
8.5 S	22	100	--	--	--	4	--	--	--	--	126	0.8
8.7 S	--	--	--	--	--	21	--	--	--	21	42	0.3
9.0 S	26	234	24	--	--	62	--	--	--	--	346	2.2
9.5 S	31	--	--	--	--	4	--	--	--	--	35	0.2
9.7 S	--	--	--	--	--	1	--	--	--	--	1	0.1
10.0 S	--	--	--	--	--	21	--	--	--	--	21	0.1
Total	7,611	3,110	3,049	841	452	342	50	45	35	54	15,589	
Percent	48.8	19.9	19.6	5.4	2.9	2.2	0.3	0.3	0.2	0.3		

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

[2]Observation time (minutes).

[3]PW=perched watching, PH=perched hunting, PX=perched, various, PP=perched preening, PD=perched drying, PU=perched unknown, PK=perched with prey, PV=perched vocalizing, PE=perched eating, OT=other behaviors (includes perched close to mate, perched interaction, bathing, gathering nest material, perched on ground, standing in water, drinking water, standing on shore)

APPENDIX M: RODEO BREEDING AREA SUMMARY

Table 53. Observed human activity and bald eagle behavior, Rodeo BA, Arizona, 2011.									
Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Gunshot	8,104	--	--	1	--	--	--	8,105	84.5
Cyclist (on bridge)	854	--	1	1	--	--	--	856	8.9
Driver (below OP)	444	--	1	1	--	--	--	446	4.7
Hiker	67	--	--	--	--	--	--	67	0.7
Helicopter	38	3	--	--	--	--	--	41	0.4
Helicopter, military	28	1	2	--	--	--	--	31	0.3
Small plane	20	--	--	--	--	--	--	20	0.2
Woodcutter	10	--	--	--	--	--	--	10	0.1
OHV	8	1	--	--	--	--	--	9	0.1
Driver (stopped on bridge)	1	2	--	1	--	--	--	4	0.1
Rancher	1	--	--	--	--	--	--	1	0.1
Total	9,575	7	4	4	--	--	--	9,590	

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

Table 54. Observed forage events and success, Rodeo BA, Arizona, 2011.						
Sex	Birds		Mammals		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	--	--	--	--	--	--
Female	1	1-0	1	1-0	2	2-0
Total	1	1-0	1	1-0	2	2-0

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

Table 55. Observed prey types delivered to the nest, Rodeo BA, Arizona, 2011.						
Sex	Fish	Birds	Mammals	Unknown	Total	Percent
Male	6	5	1	10	22	37.9
Female	8	3	--	25	36	62.1
Total	14	8	1	35	58	
Percent	24.1	13.8	1.7	60.3		

Table 56. Observed prey species delivered to the nest, Rodeo BA, Arizona 2011.										
Sex	Fish			Birds				Mammals	Total	Percent
	LB	CS	SS	DU	WS	AC	PB	RO		
Male	5	--	1	1	2	1	1	1	12	52.2
Female	3	5	--	2	1	--	--	--	11	47.8
Total	8	5	1	3	3	1	1	1	23	
Percent	34.8	21.7	4.3	13.0	13.0	4.3	4.3	4.3		

[1]LB=largemouth bass, CS=catfish species, SS=Sonoran sucker, DU=duck species, WS=waterfowl species, AC=American coot, PB=pied-billed grebe, RO=rodent species.

Table 57. Bald eagle habitat analysis at the Rodeo BA, Arizona, 2011.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
3.0	CL	Left	Yes	7	--	CW
3.6a	CL	Left	Yes	6	--	CW
3.6b	HS	Left	No	6	--	CW
3.7a	CM	Left	No	6	--	CW
3.7b	TX	Left	Yes	6	--	CW
3.7c	HS	Left	No	6	--	CW
3.9a	HS	Left	No	6	--	CW
3.9b	CL	Left	No	6	--	CW
4.1a	CM	Left	Yes	7	--	CW
4.1b	CL	Left	Yes	8	--	CW
4.1c	CL	Left	Yes	6	--	CW
4.1d	CL	Left	Yes	7	--	CW
4.2a	CM	Right	No	1	RU	--
4.2b	CM	Left	Yes	5	--	CW
4.2c	CM	Left	Yes	7	--	CW
4.2d	CL	Left	Yes	7	--	CW
4.2e	CL	Left	No	8	--	CW
4.8	CM	Left	No	8	--	TX

[1]River kilometer (Hunt et. al. 1992).
[2]CL=cottonwood large (>20m), CM=cottonwood medium (10-20m), HS=hard snag (main branches only), TX=tamarisk.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]RU=run.
[5]CW=cottonwood grove, TX=tamarisk.

Table 58. Bald eagle habitat use at the Rodeo BA, Arizona, 2011.

River km[1]	PH[2,3]	PW	PP	PK	PR	PV	PD	Total	Percent
3.0	--	--	--	--	2	--	--	2	0.1
3.6	30	--	--	--	19	--	--	49	0.4
3.7	4	68	194	--	4,974	39	24	5,303	44.4
3.9	44	--	--	2	477	--	--	523	4.4
4.1	18	32	147	--	1,804	13	--	2014	16.9
4.2	3,311	131	42	--	544	--	29	4,057	34.0
Total	3,407	231	383	2	7,820	52	53	11,948	
Percent	28.5	1.9	3.2	0.0	65.5	0.4	0.4		

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

APPENDIX N: SAGUARO BREEDING AREA SUMMARY

Table 59. Observed human activity and bald eagle behavior, Saguaro BA, Arizona, 2011.

Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Boat	573	3	1	4	2	43	10	636	91.0
Helicopter	13	7	1	--	--	5	5	31	4.4
Small plane	17	--	--	--	4	2	1	24	3.4
Large plane	1	2	--	--	--	--	1	4	0.6
Helicopter, Apache	2	--	--	--	--	--	1	3	0.4
Helicopter, sheriff	1	--	--	--	--	--	--	1	0.2
Total	607	12	2	4	6	50	18	699	

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

Table 60. Observed forage events and success, Saguaro BA, Arizona, 2011.

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

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

Table 61. Bald eagle habitat analysis at the Saguaro BA, Arizona, 2011 (continued next page).

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
32.2	CF	Left	No	1	RS	CL
32.1	PF	Left	Yes	1	RS	CL
32.0	CF	Left	Partial	1	RS	CL
31.9	PT	Left	No	1	RS	CL
31.9	CT	Left	Yes	1	RS	CL
31.9	CF	Left	Partial	1	RS	CL
31.8	CF	Left	Partial	1	RS	CL
31.8	CT	Left	Partial	1	RS	CL
31.8	PF	Left	Partial	1	RS	CL
31.7	PF	Left	No	1	RS	CL
31.7	CT	Left	No	1	RS	CL
31.7	CF	Left	Partial	1	RS	CL
31.7	CT	Left	Yes	2	RS	CL
31.6	CT	Left	No	1	RS	CL
316	CF	Left	Partial	1	RS	CL
31.5	CT	Left	No	1	RS	CL
31.5	CF	Left	Partial	1	RS	CL
31.5	RW	Left	No	1	RS	CL
31.4	PT	Left	Partial	1	RS	CL

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff ledge, CT=cliff top, HL=hillside, HS=hard snag (main branches only), PF=pinnacle ledge, PT=pinnacle top, RW=rock in water, SO=shore, SS=shrub snag.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]RS=reservoir main body.
[5]CL=cliffs, SO=shore, UP=upland desert.

Table 61 continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
31.4	CT	Left	No	1	RS	CL
31.3	CF	Left	Partial	1	RS	CL
31.3	PT	Left	Partial	1	RS	CL
31.1	HL	Left	No	1	RS	UP
30.4	SS	Right	No	1	RS	SO
30.1	SO	Right	No	1	RS	CL
29.9	HS	Right	No	1	RS	CL
29.8	CT	Right	No	1	RS	CL

[1]River kilometer (Hunt et. al. 1992).
[2]CF=cliff ledge, CT=cliff top, HL=hillside, HS=hard snag (main branches only), PF=pinnacle ledge, PT=pinnacle top, RW=rock in water, SO=shore, SS=shrub snag.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]RS=reservoir main body.
[5]CL=cliffs, SO=shore, UP=upland desert.

Table 62. Bald eagle habitat use at the Saguaro BA, Arizona, 2011.

River km[1]	PW[2,3]	CL	PE	PH	PP	PX	DW	PV	CO	Total	Percent
29.8	--	9	--	--	--	--	--	--	--	9	0.5
29.9	--	--	--	12	--	--	--	--	--	12	0.6
30.1	--	--	--	3	--	--	--	--	--	3	0.1
30.3	--	--	--	--	--	--	5	--	--	5	0.3
30.4	--	--	20	--	--	--	--	--	--	20	1.1
31.3	106	--	--	--	--	--	--	--	--	106	5.8
31.4	256	--	--	--	--	--	--	--	--	256	14.1
31.5	436	57	--	--	--	1	--	--	1	495	27.3
31.6	163	--	--	--	--	--	--	1	--	164	9
31.7	278	--	--	--	7	6	--	1	--	292	16.1
31.8	147	--	--	--	--	--	--	2	--	149	8.2
31.9	183	--	28	--	--	--	--	--	--	211	11.6
32.0	5	--	--	--	--	--	--	--	--	5	0.3
32.1	9	--	--	--	--	--	--	--	--	9	0.5
32.2	81	--	--	--	--	--	--	--	--	81	4.5
Total	1,664	66	48	15	7	7	5	4	1	1,817	
Percent	91.6	3.6	2.7	0.8	0.4	0.4	0.3	0.2	0.1		

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, CL=perched close to mate, PE=perched eating, PH=perched hunting, PP=perched preening, PX=perched various, DW=drinking water, PV=perched vocalizing, CO=copulation.

APPENDIX O: SYCAMORE BREEDING AREA SUMMARY

Table 63. Observed human activity and bald eagle behavior, Sycamore BA, Arizona, 2011.									
Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Helicopter	15	8	1	--	--	3	--	27	19.3
Small plane	15	2	--	--	--	4	--	21	15.0
OHV	10	5	--	--	--	4	--	19	13.6
Rafter	8	3	--	1	--	5	--	17	12.1
Helicopter, Apache	10	2	1	--	--	3	--	16	11.4
Driver	6	2	--	1	--	4	--	13	9.3
Horseback rider	10	2	--	--	--	--	--	12	8.6
Helicopter, sheriff	4	1	--	--	--	1	--	6	4.3
Ultralight	3	1	--	--	--	--	--	4	2.9
Canoe/kayak	1	1	--	--	--	1	--	3	2.1
Swimmer	--	--	--	--	--	1	--	1	0.7
Fisherman	1	--	--	--	--	--	--	1	0.7
Total	83	27	2	2	--	26	--	140	

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

Table 64. Observed forage events and success, Sycamore BA, Arizona, 2011.						
Sex	Fish		Carrion		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	2	2-0	1	1-0	3	3-0
Female	--	--	--	--	--	--
Total	2	2-0	1	1-0	3	3-0

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

Table 65. Observed prey types delivered to the nest, Sycamore BA, Arizona, 2011.							
Sex	Fish	Birds	Mammals	Reptiles	Unknown	Total	Percent
Male	22	2	1	--	13	38	55.9
Female	24	2	1	1	2	30	44.1
Total	46	4	2	1	15	68	
Percent	67.6	5.9	2.9	1.5	22.1		

Table 66. Observed prey species delivered to the nest, Sycamore BA, Arizona 2011.						
Sex	Fish			Reptiles	Total	Percent
	SN	DS	RT	SS		
Unknown	5	3	2	1	11	100
Total	5	3	2	1	11	
Percent	45.5	27.3	18.2	9.1		

[1]SN=green sunfish, DS =desert sucker, RT=rainbow trout, SS=spiny softshell turtle.

Table 67. Bald eagle habitat analysis at the Sycamore BA, Arizona, 2011.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
9.4 V	SM	Left	No	1	RU/RI	MB
9.6 V	CM	Left	Partial	5	RU	MB
10.0 V	CL	Left	No	4	RU	MB
10.2 V	SP	Left	No	6	RU	MB
10.3 V	SG	Right	No	1	RI	MB
10.4 V	SG	Left	No	7	RU	MB
10.6 V	CM	Right	Partial	4	RI	CW
11.7 V	ST	Right	No	1	RU	MB
11.8 V	SP	Right	No	2	RU	MB
0.4 S	CL	Left	Yes	7	RU	CW
0.6 S	SM	Right	No	8	--	MB
0.9 S	YL	Left	No	8	--	TX

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

Table 68. Bald eagle habitat use at the Sycamore BA, Arizona, 2011.								
River km[1]	PW[2,3]	PH	PP	PD	ET	PV	Total	Percent
9.4 V	183	162	--	--	--	--	345	1.9
9.6 V	23	--	--	--	--	--	23	0.1
10.0 V	21	--	--	--	--	--	21	0.1
10.2 V	--	--	--	--	15	--	15	0.1
10.3 V	--	170	--	--	--	--	170	1.0
10.4 V	15,546	--	542	177	45	32	16,342	90.4
10.6 V	2	41	--	--	--	--	43	0.2
11.7 V	116	584	13	--	--	--	713	3.9
11.8 V	33	37	--	--	--	--	70	0.4
0.4 S	298	--	--	--	--	--	298	1.7
0.6 S	5	--	--	--	--	--	5	0.1
0.9 S	29	--	--	--	--	--	29	0.2
Total	16,256	994	555	177	60	32	18,074	
Percent	89.9	5.5	3.1	1.0	0.3	0.2		

[1]River kilometer (Hunt et. al. 1992). V=Verde River, S=Sycamore Creek.
[2]Observation time (minutes).
[3]PW=perched watching, PH=perched hunting, PP=perched preening, PD=perched drying, ET=eating in tree, PV=perched vocalizing.

APPENDIX P: TONTO BREEDING AREA SUMMARY

Table 69. Observed human activity and bald eagle behavior, Tonto BA, Arizona, 2011.									
Human Activity	N[1]	W	R	F	L	B	U	Total	Percent
Boat, fishing	698	1	--	--	--	--	--	699	83.8
Boat, other	73	1	--	1	--	--	--	75	10.7
Canoe/kayak	21	--	--	--	--	--	--	21	2.5
Helicopter	10	3	1	--	--	--	--	10	1.2
Jet ski	7	--	--	--	--	--	--	7	0.8
Small plane	5	--	--	--	--	--	--	5	0.6
Hunter	5	--	--	--	--	--	--	5	0.6
Hiker	3	--	--	--	--	--	--	3	0.4
Fisherman	2	--	--	--	--	--	--	2	0.2
Paraglider	1	--	1	--	--	--	--	2	0.2
Horseback rider	1	--	--	--	--	--	--	1	0.1
Total	826	5	2	1	--	--	--	834	

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

Table 70. Watercraft compliance at the closure boundary, Tonto BA, Arizona, 2011.					
Date	Boats at Closure	Boats in Closure	Jet Skis at Closure	Jet Skies in Closure	Total
2/5-2/14	26	--	--	--	26
2/19-2/28	9	--	--	--	9
3/4-3/14	64	2	3	--	69
3/18-3/28	116	3	2	1	122
4/1-4/11	80	3	1	--	84
4/15-4/25	136	4	5	--	145
4/30-5/9	50	2	1	--	53
5/10-5/26	47	2	4	--	53
Total	528	16	16	1	561
Percent	97.1	2.9	65.0	35.0	

Table 71. Watercraft compliance: weekend vs. weekday, Tonto BA, Arizona, 2011.						
Date	Boats at Closure	Boats in Closure	Jet Skis at Closure	Jet Skies in Closure	Total	Percent
Weekend	368	11	9	--	388	69.1
Weekday	160	5	7	1	173	30.8
Total	528	16	16	1	561	

Table 72. Observed forage events and success, Tonto BA, Arizona, 2011.										
Sex	Fish		Birds		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	49	43-6	1	1-0	1	1-0	3	1-2	54	46-8
Female	8	8-0	--	--	--	--	--	--	8	8-0
Total	57	51-6	1	1-0	1	1-0	3	1-2	62	54-8

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

Table 73. Observed prey types delivered to the nest, Tonto BA, Arizona, 2011.						
Sex	Fish	Mammals	Birds	Unknown	Total	Percent
Male	114	5	4	4	127	80.9
Female	23	--	--	1	24	15.3
Unknown	5	--	--	1	6	3.8
Total	142	5	4	6	157	
Percent	90.4	3.2	2.6	3.8		

Table 74. Observed prey species delivered to the nest, Tonto BA, Arizona 2011.								
Sex	Fish		Birds	Mammals			Total	Percent
	LB[1]	BC	AC	JK	RS	SR		
Male	3	3	1	2	2	1	12	85.7
Female	2	--	--	--	--	--	2	14.3
Total	5	3	1	2	2	1	14	
Percent	35.7	21.4	7.1	14.3	14.3	7.1		

[1]LB=largemouth bass, BC=black crappie, AC=American coot, JK=jackrabbit species, RS=rabbit species, SR=small rodent species.

Table 75. Bald eagle habitat analysis at the Tonto BA, Arizona, 2011.						
Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
10.0	PT	Left	No	4	RC	UP
15.8	HS	Right	No	1	BW	---
15.9a	HS	Right	No	1	BW	---
15.9b	HS	Right	No	1	BW	---
16.3a	HS	Right	No	1	BW	---
16.3b	HS	Right	No	1	BW	---
16.8	HS	Right	No	1	BW	---
16.9a	HS	Left	No	1	BW	MB
16.9b	LG	Left	No	1	BW	---
16.9c	SM	Left	No	1	BW	---
17.1a	HS	Right	No	1	BW	---
17.1b	LG	Right	No	1	BW	---
17.2	HS	Right	No	1	BW	---
17.3	HS	Left	No	1	BW	MB
17.4	YL	Right	No	1	BW	MB

[1]River kilometer (Hunt et. al. 1992).
[2]HS=hard snag (main branches only), LG=log, PT=pinnacle top, SM=snag (mesquite), YL=Sycamore large/10-20+m.
[3]1=0-25m, 2=26-50m, 3=51-75m, 4=76-100m, 5=101-200m, 6=201-300m, 7=301-400m, 8=>400m.
[4]RC=reservoir cove, BW=backwater.
[5]MB=mesquite bosque, UP=upland desert.

Table 76. Bald eagle habitat use at the Tonto BA, Arizona, 2011.

River km[1]	PW[2,3]	CL	PP	PD	PE	PH	DW	PV	OT	Total	Percent
15.9	691	--	--	39	26	9	--	--	--	765	3.1
16.3	909	--	136	21	60	51	--	11	--	1188	4.8
16.8	443	--	--	--	--	--	--	--	--	443	1.8
16.9	19,012	694	326	152	95	27	156	53	50	20,565	83.8
17.1	94	--	--	--	--	52	--	--	--	146	0.6
17.2	664	--	--	--	--	43	--	--	--	707	2.9
17.3	299	--	--	93	11	--	--	--	--	403	1.6
17.4	310	--	--	--	--	--	--	--	--	310	1.3
Total	22,422	694	462	305	192	182	156	64	50	24,527	
Percent	91.4	2.8	1.9	1.2	0.8	0.7	0.6	0.3	0.2		

[1]River kilometer (Hunt et. al. 1992).
[2]Observation time (minutes).
[3]PW=perched watching, CL=perched close to mate, PP=perched preening, PD=perched drying, PE=perched eating, PH=perched hunting, DW=drinking water, PV=perched vocalizing, OT=other (includes perched unknown, bathing, and perched with prey).

APPENDIX Q: WOODS CANYON BREEDING AREA SUMMARY

Table 77. Observed human activity and bald eagle behavior, Woods Canyon BA, Arizona, 2011.[1]

Human Activity	N[2]	W	R	F	L	B	U	Total	Percent
Boat	27	27	1	1	--	--	--	56	48.7
Hiker	7	14	--	1	--	--	--	22	19.1
Fisherman	9	2	--	--	--	--	--	11	9.6
Canoe/kayak	3	2	--	2	--	--	--	7	6.1
Small plane	2	2	--	--	--	--	--	4	3.5
Photographer	3	1	--	--	--	--	--	4	3.5
Nestwatcher	1	3	--	--	--	--	--	4	3.5
Fishing tube	3	--	--	--	--	--	--	3	2.5
Helicopter	1	1	--	--	--	--	--	2	1.7
Picnicker	1	--	--	--	--	--	--	1	0.9
Gunshot	1	--	--	--	--	--	--	1	0.9
Total	58	52	1	4	--	--	--	115	

[1]Activities within 25m of an adult or fledgling and all aircraft <2,000 feet above ground level and within 1 km of the nest. Activities >25m from an eagle were not seen to cause a significant reaction.
[2]Bald eagle response: N=none, W=watched, R=restless, F=flushed, L=left area, B=birds not in area, U=unknown.

Table 78. Observed forage events and success, Woods Canyon BA, Arizona, 2011.

Sex	Fish		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	51	38-13	1	0-1	52	38-14
Female	12	8-4	1	0-1	13	8-5
Unknown	6	5-1	2	0-2	8	5-3
Total	69	51-18	4	0-4	73	51-22

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

Table 79. Observed prey types delivered to the nest and fledglings, Woods Canyon BA, Arizona, 2011.

Sex	Fish[1]	Unknown	Total	Percent
Male	171	7	178	75.4
Female	30	3	33	14.0
Unknown	21	4	25	10.6
Total	222	14	236	
Percent	94.1	5.9		

[1]212 were rainbow trout, 10 were unidentified species.

Table 80. Bald eagle habitat analysis at the Woods Canyon BA, Arizona, 2011 (continued next page).

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
0.1	PO	Left	No	1	RS	CF
0.2a	HS	Left	No	1	RS	CF
0.2b	PO	Left	No	2	RS	CF
0.2c	PS	Left	Partial	1	RS	CF
0.3	HS	Left	No	1	RS	CF
0.4	ST	Left	No	1	RS	CF
0.8	HS	Left	No	1	RC	PF
0.9a	PO	Left	Partial	1	RS	SO
0.9b	PS	Left	Partial	1	RS	CF
0.9c	SG	Left	No	1	RS	CF
0.9d	ST	Left	No	1	RS	CF
1.0a	PO	Left	Partial	1	RS	SO
1.0b	PS	Left	Partial	1	RS	CF
1.0c	SG	Left	No	1	RS	CF
1.0d	ST	Left	No	1	RS	CF
1.1a	PO	Left	No	1	RS	CF
1.1b	PS	Left	Yes	1	RS	CF
1.1c	PS	Left	Partial	1	RS	SO
1.1d	SG	Left	No	1	RS	CF
1.1e	SO	Left	No	1	RS	CF
1.1f	SS	Left	No	1	RS	CF
1.1g	ST	Left	No	1	RS	CF
1.2a	PS	Left	Yes	1	RS	CF
1.2b	ST	Left	Yes	2	RS	CF
1.3a	HL	Left	Partial	1	RS	SO
1.3b	HL	Left	Partial	1	RS	CF
1.3c	PS	Left	Partial	1	RS	SO
1.3d	SG	Left	Partial	1	RS	SO
1.4a	LG	Left	Yes	1	RS	CF
1.4b	PO	Left	Yes	1	RC	SO
1.4c	PS	Left	No	1	RS	CF
1.5a	PO	Left	Partial	1	RC	CF
1.5b	PS	Left	Yes	1	RC	CF
1.6	PO	Left	Partial	1	RC	SO
1.7a	PO	Left	Yes	1	RC	SO
1.7b	PS	Left	Partial	1	RC	CF
1.7c	SO	Left	Yes	1	RC	CF
1.8	PS	Left	No	1	RS	CF
1.9	PO	Left	Yes	1	RS	CF
2.0	PS	Left	No	1	RS	CF

[1]Lake kilometer (counterclockwise from middle of dam).

[2]CS=cottonwood small/0-10 m., HL=hillside, HS=hard snag (main branches only), LG=log, PO=pine/conifer, old growth/20-30+ m., PS=pine/conifer, 2nd growth/10-20+ m, SC=snag, conifer, SG=soft snag (dead but branches still intact), SO=shore, SS=snag, shrub, ST=snag top.

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

[4]RS=reservoir main body, RC=reservoir cove.

[5]CF=conifer forest, SO=shore.

Table 80 continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
2.2a	HS	Left	No	1	RS	CF
2.2b	SG	Left	No	1	RS	CF
2.3a	HS	Left	No	1	RS	CF
2.3b	SG	Left	No	1	RS	CF
2.4a	HS	Left	Yes	2	RS	CF
2.4b	PS	Left	Partial	1	RS	CF
2.4c	SC	Left	No	1	RS	CF
2.4d	SO	Left	No	1	RS	SO
2.5a	HS	Left	No	3	RS	CF
2.5b	PS	Left	Partial	2	RS	CF
2.5c	PS	Left	Partial	1	RC	CF
2.9a	PS	Left	Partial	1	RS	CF
2.9b	PS	Left	No	2	RS	CF
3.2	SG	Right	Partial	1	RC	CF
3.3a	PS	Right	Partial	2	RS	CF
3.3b	SG	Right	No	1	RC	CF
3.4a	SC	Right	No	1	RS	CF
3.4b	SG	Right	No	1	RS	CF
3.4c	SG	Right	No	2	RS	CF
3.4d	SG	Right	Partial	3	RS	CF
3.4e	SG	Right	Partial	1	RS	SO
3.5a	CS	Right	No	1	SR	CF
3.5b	HS	Right	Partial	1	RS	CF
3.5c	HS	Right	No	4	RS	CF
3.5d	HS	Right	Partial	2	RS	CF
3.5e	HS	Right	No	3	RS	CF
3.5f	HS	Right	No	1	RS	CF
3.5g	PS	Right	Partial	1	RS	CF
3.5h	SC	Right	No	2	RS	CF
3.5i	SG	Right	No	4	RS	CF
3.5j	SG	Right	Partial	1	RS	CF
3.5k	SG	Right	No	3	RS	CF
3.5l	SG	Right	No	2	RS	CF
3.5m	ST	Right	No	2	RS	CF
3.5n	ST	Right	No	1	RS	CF
3.6a	CS	Right	Partial	1	RS	CF
3.6b	PO	Right	No	1	RS	SO
3.6c	SG	Right	No	1	RS	CF
3.6d	SO	Right	No	1	RS	CF
3.6e	ST	Right	No	1	RS	CF
3.7a	SG	Right	No	1	RS	SO
3.7b	SG	Right	Partial	1	RS	CF

[1]Lake kilometer (counterclockwise from middle of dam).

[2]CS=cottonwood small/0-10 m., HL=hillside, HS=hard snag (main branches only), LG=log, PO=pine/conifer, old growth/20-30+ m., PS=pine/conifer, 2nd growth/10-20+ m, SC=snag, conifer, SG=soft snag (dead but branches still intact), SO=shore, SS=snag, shrub, ST=snag top.

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

[4]RS=reservoir main body, RC=reservoir cove.

[5]CF=conifer forest, SO=shore.

Table 80 continued.

Perch Location[1]	Perch Type[2]	Side	Shade	Distance to H_2O[3]	H_2O Type[4]	Land Type[5]
3.8a	SC	Right	No	1	RS	CF
3.8b	SG	Right	Partial	1	RS	CF
3.8c	SG	Right	No	2	RS	CF
3.9	SG	Right	No	1	RS	CF
4.1a	PO	Right	Yes	1	RS	SO
4.1b	PS	Right	No	1	RS	SO
4.2	PS	Right	Yes	1	RS	CF
4.3	SG	Right	No	1	RS	CF
4.4	PO	Right	Yes	1	RS	CF
4.5	PO	Right	Yes	1	RS	SO
4.6a	HS	Right	No	2	RS	CF
4.6b	PS	Right	Yes	1	RS	CF
4.7a	PO	Right	Partial	1	RS	CF
4.7b	PS	Right	Partial	1	RS	CF
4.7c	PS	Right	Partial	2	RS	CF
4.8	ST	Right	No	1	RS	CF
4.9	PO	Right	Partial	1	RS	SO
5.0a	PO	Right	Partial	1	RS	SO
5.0b	PS	Right	No	1	RS	CF
5.1a	HS	Right	No	1	RS	CF
5.1b	PS	Right	Yes	1	RS	CF
5.2	PS	Right	Yes	1	RS	SO

[1]Lake kilometer (counterclockwise from middle of dam).

[2]CS=cottonwood small/0-10 m., HL=hillside, HS=hard snag (main branches only), LG=log, PO=pine/conifer, old growth/20-30+ m., PS=pine/conifer, 2nd growth/10-20+ m, SC=snag, conifer, SG=soft snag (dead but branches still intact), SO=shore, SS=snag, shrub, ST=snag top.

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

[4]RS=reservoir main body, RC=reservoir cove.

[5]CF=conifer forest, SO=shore

Table 81. Bald eagle habitat use at the Woods Canyon BA, Arizona, 2011.

Lake km[1]	PW[2,3]	PH	PD	PG	PE	PP	PK	DW	PV	OT	Total	Percent
0.1	--	36	--	--	--	--	--	--	--	--	36	0.5
0.2	511	29	--	--	3	--	--	--	--	--	543	7.0
0.3	694	--	--	--	--	--	--	--	--	--	694	9.0
0.9	511	78	--	--	15	15	--	--	--	--	619	8.0
1.0	17	74	--	--	--	--	--	--	--	--	91	1.2
1.1	1,188	263	16	2	2	--	1	13	--	10	1,495	19.9
1.2	17	--	--	--	--	--	--	--	--	1	18	0.2
1.3	293	46	74	24	--	--	5	--	1	--	443	5.7
1.4	--	--	--	--	14	--	4	--	--	4	22	0.3
1.5	8	27	--	--	--	--	--	--	--	--	35	0.5
1.6	--	--	--	--	--	--	4	--	--	--	4	0.1
1.7	374	77	--	12	--	--	--	--	--	--	463	6.0
1.8	130	--	--	--	--	--	--	--	--	--	130	1.7
1.9	--	--	--	--	--	--	6	--	--	--	6	0.1
2.0	64	--	--	--	--	--	--	--	--	--	64	0.8
2.2	130	16	--	--	--	--	--	--	--	--	146	1.9
2.3	27	--	--	--	--	--	--	--	--	--	27	0.3
2.4	20	--	--	--	--	--	--	--	--	--	20	0.3
2.5	9	--	--	--	--	--	--	--	3	--	12	0.1
2.7	5	--	--	--	--	--	--	5	--	--	10	0.1
2.9	11	1	--	--	--	--	--	--	--	--	12	0.1
3.2	7	--	--	--	--	--	--	--	--	--	7	0.1
3.3	5	32	--	--	--	--	--	--	--	--	37	0.5
3.4	134	172	--	--	--	--	--	--	--	--	306	4.0
3.5	206	4	--	--	--	17	1	--	2	--	230	3.0
3.6	80	11	--	--	--	--	6	--	--	--	97	1.3
3.7	3	20	--	--	--	--	--	--	1	--	24	0.3
3.8	135	235	--	--	--	--	--	--	2	--	372	4.8
3.9	71	--	--	--	--	--	--	--	--	--	71	0.9
4.1	84	22	--	--	--	--	--	--	--	--	106	1.4
4.2	56	--	--	--	--	--	--	--	--	--	56	0.7
4.3	15	--	--	--	--	--	--	--	--	--	15	0.2
4.4	--	2	--	--	--	--	--	--	--	--	2	0.1
4.5	--	43	--	--	--	--	--	--	--	--	43	0.6
4.6	61	7	--	--	--	--	--	--	--	--	68	0.9
4.7	379	633	--	--	--	--	--	--	--	--	1,012	13.1
4.8	33	--	--	--	--	--	--	--	--	--	33	0.4
4.9	22	120	--	--	--	--	--	--	--	--	142	1.8
5.0	--	40	--	--	--	--	--	--	--	--	40	0.5
5.1	130	19	--	--	--	--	--	--	--	--	149	1.9
5.2	--	2	--	--	--	--	--	--	--	--	2	0.1
Total	5,430	2,009	90	38	34	32	27	18	9	15	7,702	
Percent	70.5	26.1	1.2	0.5	0.4	0.4	0.4	0.2	0.1	0.2		

[1]Lake kilometer (counterclockwise from middle of dam).

[2]Observation time (minutes).

[3]PW=perched watching, PH=perched hunting, PD=perched drying, PG=perched on ground, PE=perched eating, PP=perched preening, PK= perched with prey, DW=drinking water, PV=perched vocalizing, OT=other (includes eating on shore, standing on shore, perched interaction, bathing, and standing in water).