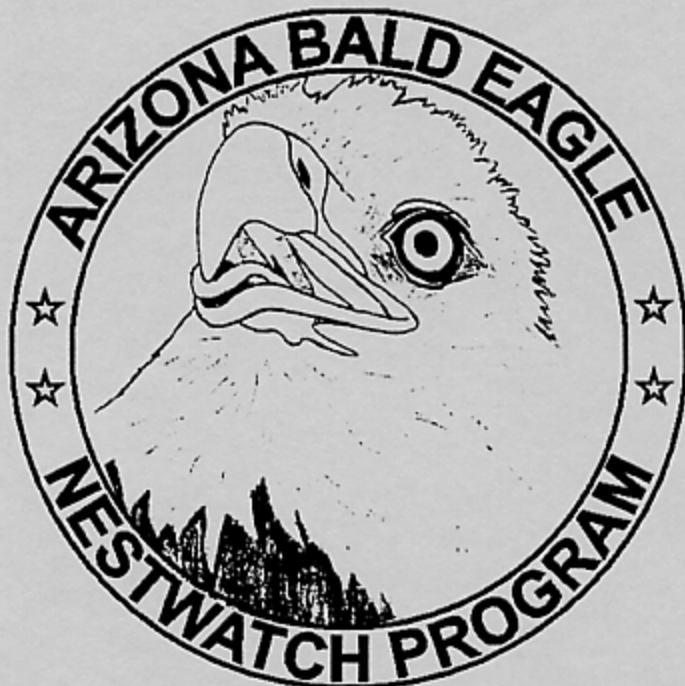


ARIZONA BALD EAGLE NESTWATCH PROGRAM: 1999 – 2000 SUMMARY REPORT

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James T. Driscoll and John G. Koloszar

INTRODUCTION

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

Due to urban sprawl and an increase in metropolitan Phoenix's human population, many Arizona bald eagle breeding areas (BAs) are located near high recreation areas. As land and wildlife management agencies became more informed on the affects of human recreation to bald eagles in these areas, the demand for protective management increased. In 1978, efforts began to monitor these areas when the U.S. Forest Service (USFS) and two Maricopa Audubon Society volunteers monitored a BA near Bartlett Reservoir. This monitoring effort eventually expanded into other areas, and developed into the Arizona Bald Eagle Nestwatch Program (ABENWP).

To adequately address the needs for Arizona's breeding bald eagles, the ABENWP operates under three goals: conservation, data collection, and education. Due to high recreation pressures along some of Arizona's lakes and rivers, land management agencies enact seasonal closures to protect the bald eagle breeding cycle. Nestwatchers interact with members of the public who visit these areas, educate them on bald eagles, distribute brochures, and/or direct them out of the closures. To help the land and wildlife management agencies make better decisions, nestwatchers collect basic demographic information and behaviors in response 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 for the rescue of bald eagles in those situations.

As we found new BAs, interagency coordination became more important. To provide oversight and increase communication, the land and wildlife management agencies formed the Southwestern Bald Eagle Management Committee (SWBEMC) in 1984. The SWBEMC is comprised of various federal, state, and county land and wildlife management agencies, Native American Tribes, and private organizations interested in bald eagle conservation. In 1986, the USFWS assumed coordination of the ABENWP on behalf of the SWBEMC, and expanded its scope. In 1991, as a result of the passage of the Heritage Initiative, the USFWS transferred the lead to the Arizona Game and Fish Department (AGFD).

This report summarizes significant discoveries at each monitored BA in 1999 and 2000. Detailed reports of each monitored BA are centralized at AGFD, and distributed to the land and wildlife management agencies where the BA occurs.

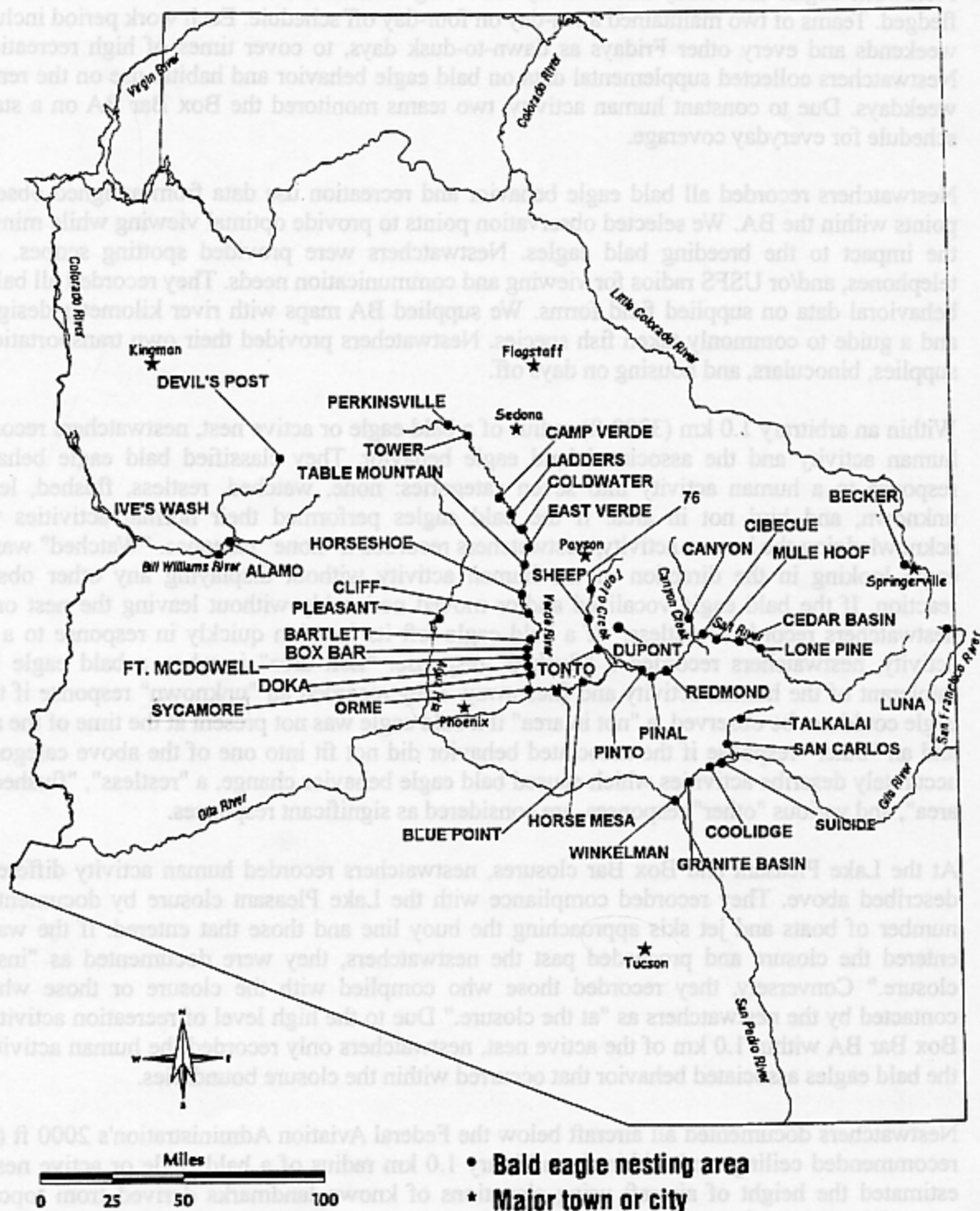


Figure 1. Location of known bald eagle BAs in Arizona, 2000.

Fieldwork began the Friday immediately following orientation, and continued until the nestlings fledged. Teams of two maintained a ten-day on four-day off schedule. Each work period included all weekends and every other Fridays as dawn-to-dusk days, to cover times of high recreation use. Nestwatchers collected supplemental data on bald eagle behavior and habitat use on the remaining weekdays. Due to constant human activity, two teams monitored the Box Bar BA on a staggered schedule for everyday coverage.

Nestwatchers recorded all bald eagle behavior and recreation use data from assigned observation points within the BA. We selected observation points to provide optimal viewing while minimizing the impact to the breeding bald eagles. Nestwatchers were provided spotting scopes, cellular telephones, and/or USFS radios for viewing and communication needs. They recorded all bald eagle behavioral data on supplied field forms. We supplied BA maps with river kilometer designations and a guide to commonly taken fish species. Nestwatchers provided their own transportation, gas, supplies, binoculars, and housing on days off.

Within an arbitrary 1.0 km (3300 ft) radius of a bald eagle or active nest, nestwatchers recorded all human activity and the associated bald eagle behavior. They classified bald eagle behavior in response to a human activity into seven categories: none, watched, restless, flushed, left area, unknown, and bird not in area. 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" is when a bald eagle became intolerant of the human activity and flies away. They recorded an "unknown" response if the bald eagle could not be observed, a "not in area" if a bald eagle was not present at the time of the activity, and an "other" response if the associated behavior did not fit into one of the above categories. To accurately describe activities which caused bald eagle behavior change, a "restless", "flushed", "left area", and various "other" responses, are considered as significant responses.

At the Lake Pleasant and Box Bar closures, nestwatchers recorded human activity different than described above. They recorded compliance with the Lake Pleasant closure by documenting the number of boats and jet skis approaching the buoy line and those that entered. If the watercraft entered the closure and proceeded past the nestwatchers, they were documented as "inside the closure." Conversely, they recorded those who complied with the closure or those who were contacted by the nestwatchers as "at the closure." Due to the high level of recreation activity at the Box Bar BA within 1.0 km of the active nest, nestwatchers only recorded the human activities and the bald eagles associated behavior that occurred within the closure boundaries.

Nestwatchers documented all aircraft below the Federal Aviation Administration's 2000 ft (600 m) recommended ceiling, and within the arbitrary 1.0 km radius of a bald eagle or active nest. They estimated the height of aircraft using elevations of known landmarks derived from topographic maps. We sent the forms with known identification numbers and aircraft type to the USFWS Law Enforcement Division for processing.

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

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

The ABENWP contractors concentrate their monitoring efforts within the BA, and therefore a bias must be considered when extrapolating conclusions about habitat utilization. Information gathered by this method informs land and wildlife management agencies about a breeding pair's behavior and potential conflicts only within the BA. Therefore, other habitat use by a particular pair should be considered when proposing projects or habitat alterations near known BAs.

RESULTS AND DISCUSSION

PROGRAM

The ABENWP monitored 11 BAs in 1999, and 12 BAs in 2000. Those BAs monitored both years include: Bartlett, Box Bar, Doka, Fort McDowell, Luna, Orme, Pleasant, Sheep, Sycamore, Tonto, and Tower. Additionally, we monitored the Horseshoe BA in 2000. The final status of monitored BAs was: 1 failed, 10 successful, 14 fledged in 1999; and 5 failed, 7 successful, 13 fledged in 2000.

Some BAs were not monitored the entire season due to breeding attempt failures (Bartlett BA 2000, Box Bar BA 1999, Sycamore BA 2000, and Tonto BA 2000), subsequent moving contractors to new sites (Orme BA 1999 and 2000, Luna BA 1999 and 2000, and Sheep BA 1999 and 2000), and incidental observations (Doka BA 1999 and 2000). Therefore observation days vary, and all collected data reflects only those instances observed during the documented time frame. Since the Doka BA was monitored only for supplemental information by the Fort McDowell nestwatchers, the summary is not included in this report.

INTERVENTION 1999

Sycamore Breeding Area

On May 20, one nestling was attempting to fly when the branch in which it was perched broke. The nestling was able to grab a lower branch of the nest tree and right itself. However, the nestling had not eaten since its sibling fledged two days prior. On May 21, we captured, hydrated, and placed it back into the nest.

Overnight the nestling fell out of the nest a second time. On May 23, we recaptured it on the ground, fed, hydrated, and placed it back into the nest a second time. The nestling successfully fledged the next morning.

Luna Breeding Area

While banding the Luna Lake nestlings on April 18, we observed deformities on both nestling's pinfeathers, and one had a distended colon. We returned the nestlings to the nest until we consulted with a veterinarian.

On April 23, after consulting with Dr. Kathy Orr, The Phoenix Zoo, we revisited the BA to take blood samples and rehabilitate the nestling with the distended colon. We returned the nestling to the nest on April 29. The deformity in pinfeathers was likely frostbite caused by the severe weather on April 1, and the distended colon healed on its own.

Nestwatch personnel arrived to monitor the BA on May 7, where they discovered the rehabilitated nestling on the ground. We recovered the nestling and sent it to Liberty Wildlife Rehabilitation for examination. Dr. Kathy Orr discovered the nestling had a hyper extended left tarsal ligament. After four months of rehabilitation using specialized braces crafted by an orthopedic surgeon, the leg was not healing, and the nestling was euthanized.

INTERVENTION 2000

Doka Breeding Area

We returned one of the Doka nestlings after it had fallen from the nest on March 26. Due to fragility of the nest tree (burned and hollow snag) we were unable to put the nestling into the nest and placed it on a lower branch.

On March 28, the Fort McDowell nestwatchers reported the nestling had not moved and had not been fed. After climbing the nest tree to retrieve the nestling, we hydrated, fed, and placed the nestling on a higher branch on the opposite side of the tree. The nestling fledged the next day.

Sheep Breeding Area

After falling from the nest on May 5, the Sheep nestling was taken to Liberty Wildlife Rehabilitation for severe dehydration on May 6. Even though the nestling had been fed the day prior to falling, extremely hot temperatures and a lack of shade in the nest tree probably caused the dehydration. The nestling died three days later in rehabilitation.

Tower Breeding Area

One Tower nestling left the nest on May 17 after its sibling fledged on May 16. However, the second nestling was not observed leaving the nest, nor flying in the BA. On May 18, we retrieved the second nestling below the nest pinnacle, hydrated, fed, and placed the nestling above the nest on a cliff.

On May 22, after a few flying attempts, the nestling remained on the cliff and had not been fed. We found the nestling the next day below the cliff near the Verde River, and placed it at Liberty Wildlife Rehabilitation. After a month of rehab for a broken keel and clavicle, the nestling was released back into the BA on June 14. There were no subsequent observations of the nestling.

BREEDING AREA SUMMARIES

Productivity Overview

The 1999 Arizona bald eagle breeding season successfully produced a record number of young (Appendix A, Tables 1 and 2). Out of 29 attempts, 21 pairs successfully produced a record 31 juveniles. Discovery of the Suicide and Granite Basin BAs, the Orme and Coldwater BAs double clutches, and nearly half of the nests producing two young all contributed to the record number.

The 2000 breeding season started similar to the record 1999 season, as 36 plus nestlings hatched (Appendix A, Tables 3 and 4). Midseason, 34 nestlings survived past four weeks old. However, due to various circumstances (predation, extreme temperatures, new adults in the pair, etc.), 12 nestlings died after April. Only 13 pairs out of 27 attempts successfully produced 22 juveniles.

Bartlett Breeding Area: 1999

Observation Period.—Observation dates February 7 to April 25
Total monitoring days 57 days

Eagle Identification.—Male Unbanded, adult plumage
Female Unbanded, adult plumage

The Bartlett pair hatched two nestlings in 1999, and one died of unknown causes before it was one week old. The remaining nestling fledged at 9.5 weeks old. As an inexperienced flyer, we captured the juvenile to band and examine for injuries (nestlings fledging from Bartlett nest #2 typically land in cholla cactus). After banding and a quick physical, we placed the nestling on a pinnacle downstream from the nest.

Management Activities.—1. The Tonto National Forest reinstated the seasonal BA closure.

Human Activity.—Nestwatchers recorded 443 human activities (Appendix B, Table 5). Aircraft (small planes, and helicopters) represented 85 percent (n=375), terrestrial activities 11 percent (n=50) of 14 different types, and watercraft (rafters, canoes, and kayaks) four percent (n=18).

Nine activities elicited 23 significant responses from the breeding pair. The bald eagles were restless to five small planes, two canoes/kayaks, one helicopter, one gunshot, and one OHV. The breeding pair flushed in response to five small planes, one canoe/kayak, one driver, one gunshot, one researcher, and one boat with a generator. The adults left the area in response to one helicopter, one canoe/kayak, and one rafter. In addition, three small planes, one helicopter, one driver, and one angler caused the adults to leave their perch and return to the nest.

Although the majority of the human activities were small aircraft (n=375) only three percent (n=12) elicited a significant response from the breeding pair. Terrestrial activities while smaller in occurrence (n=68), elicited significant responses in 16 percent (n=11). This could indicate the pair is either more accustomed to aircraft, or the pair identifies terrestrial activity as a bigger threat.

Food Habits.—Nestwatchers observed 24 forage attempts (Appendix B, Table 6). The male was successful in 85 percent of the attempts (11 of 13), and the female 100 percent (11 of 11). Most common forage item was fish (n=21).

The breeding pair delivered 84 prey items to the nest (Appendix B, Table 7). The male delivered 82 percent (n=69), the female 14 percent (n=12), and an unknown adult 4 percent (n=3). Seventy percent of those were fish (n=59), 16 percent unknown (n=13), five percent each birds and mammals (n=4 each), and two percent each herps and carrion (n=2 each).

Of the 45 prey items delivered that could be identified to species, 57 percent were suckers (n=26) (Appendix B, Table 8). Other prey items included: channel catfish (n=5), largemouth bass (n=4), American coot (n=4), western cottontail rabbits (n=2), bluegills (n=2), black crappie (n=1), and rock squirrel (n=1).

Bartlett Breeding Area: 2000

Observation Period.—Observation dates February 4 to February 20
Total monitoring days/hours..... 16 days/119.8 hours

Eagle Identification.—Male Unbanded, adult plumage
Female Blue VID band left leg, USFWS band right leg, adult plumage

The Bartlett adults laid eggs and failed in nest #1. However, the female was new to the pair this year and the male did not incubate the eggs. As a result the female was forced to abandon the breeding attempt.

Management Activities.—1. The Tonto National Forest reinstated the seasonal BA closure.

Human Activity.—Nestwatchers recorded only 15 human activities during their 16 days of monitoring (Appendix B, Table 9). Aircraft (small planes and helicopters) represented 40 percent (n=6), terrestrial activities 53 percent (n=8) of four different types, and watercraft (canoes and kayaks) seven percent (n=1). No activities elicited a significant responses from the breeding pair.

Food Habits.—Nestwatchers observed 3 forage attempts in the BA. The male was successful in 100 percent (1 of 1), and the female 50 percent (1 of 2). All forage attempts were for fish. The breeding pair delivered three prey items to the nest. The male delivered 33 percent (n=1), and the female 66 percent (n=2). One prey item was identified as an American Coot, the other two were unknown.

Box Bar Breeding Area: 1999

Observation Period.—Observation dates February 5 to March 27
Total monitoring days/hours..... 48 days/474 hours

Eagle Identification.—Male.....Blue VID band left leg, USFWS band right leg, adult plumage
FemaleBlue VID band left leg, USFWS band right leg, adult plumage

After lightning struck the only nest, the Box Bar pair began building a new nest in an upstream cottonwood on January 8. Due to an unknown cause, the adults abandoned the breeding attempt after hatching on March 24.

Management Activities.—1. The Tonto National Forest reinstated the seasonal BA closure, 2. Two ABENWP teams monitored the BA for continuous coverage, 3. ABENWP contractors monitored the recreational use of USFS Road 160, 4. ABENWP contractors were active in educating the public visiting the Rio Verde Ranch, 5. The owners of Rio Verde Ranch allowed ABENWP to camp and monitor from their lawn.

Human Activity. —Nestwatchers recorded 152 human activities within 48 days of monitoring (Appendix C, Table 10). Aircraft (small planes and helicopters) represented 55 percent (n=84), terrestrial activity 40 percent (n=61) of seven types, and watercraft (canoes/kayaks and tubers) five percent (n=8).

Six activities elicited eight significant responses from the breeding pair. The bald eagles were restless to three gunshots, one small plane, one helicopter, and one OHV. The breeding pair flushed in response to one horseback rider, and the birds left the area when biologists climbed the nest.

Nestwatchers documented the times of highest recreational use within the closure, and tallied people at the USFS Fee Station on USFS Road 160 (Appendix C, Table 11). They discovered 56 percent of all human activity occurred during Saturday and Sunday. In addition, they documented 211 vehicles containing 507 people entering the Needle Rock Recreation Area in 44.5 hours of monitoring on weekends.

Situated near two semi-retirement communities, Rio Verde Ranch not only offers a good place to view the river (and bald eagles) for visiting guests, but also allows the ABENWP contractors a unique opportunity to educate a large group of people. During their 48 days of observation, ABENWP educated 1,457 people visiting the ranch and 84 people entering the Needle Rock Recreation Area.

Food Habits.—Nestwatchers observed seven forage attempts (Appendix C, Table 12). The male was successful in 100 percent (3 of 3), and the female in 75 percent (3 of 4). Seventy-one percent (n=5) of the forage attempts were for fish, and 29 percent (n=2) unknown.

The breeding pair delivered eight items to the nest. The male delivered 75 percent (n=6), and the female 25 percent (n=2). The most common prey types were fish and unknown prey (n=4 each). No prey items were identified to species.

Box Bar Breeding Area: 2000

Observation Period.—Observation datesFebruary 5 to May 7
Dawn-to-dusk hours512.2 hours
Total monitoring days/hours..... 93 days/948.3 hours

Eagle Identification.—MaleBlue VID band left leg, USFWS band right leg, adult plumage
FemaleBlue VID band left leg, USFWS band right leg, adult plumage

Management Activities.— 1. The Tonto National Forest reinstated the seasonal BA closure. 2. Two ABENWP teams monitored the BA for daily coverage, 3. USFS moved access to USFS Road 160 to within the fee area for the Needle Rock Recreation Area, 4. ABENWP contractors were active in educating the public visiting the Rio Verde Ranch and those in the campground, 5. The owners of Rio Verde Ranch allowed ABENWP to camp and monitor from their lawn, 6. An unidentified Boy Scout Troop posted signs about the bald eagle closure on the west side of the river near the campground.

Human Activity.—Nestwatchers recorded 489 human activities (Appendix C, Table 13). Aircraft (small planes and helicopters) represented 67 percent (n=327), terrestrial activity 32 percent (n=155) of 13 different types, and watercraft (canoes and tubers) one percent (n=7).

Ten activities elicited 18 significant responses from the breeding pair. The bald eagles were restless to two gunshots, one helicopter, one agency worker, and one researcher. The breeding pair flushed in response to three drivers, three agency workers, one shooter, one birder, one helicopter, one hiker, and one horseback rider. In addition, the adults left the area in response to one helicopter and one OHV.

If an effort to accurately describe closure violators, nestwatchers tallied the method of entry and time of year they entered the closure (Appendix C, Table 14). Although the method of entry was similar for people on foot as it was for people on horseback or in cars (49.7 percent and 50.3 percent, respectively), 50.3 percent of those documented entered the closure in April. This is inevitably due to the warmer temperatures. During that month, 67.6 of the recreationists entered on foot. We have no data on whether the closure was the impeding factor, or this was time of high river flows affecting the river crossings.

Nestwatchers contacted 2,322 individuals at Rio Verde Ranch and the campground at the end of USFS Road 160. An average of 70 people in 23 cars visited the campground each weekend, and over 1,600 people visited the ABENWP contractors at the Rio Verde Ranch.

Food Habits.—Nestwatchers observed four forages attempts. Both the male and female were successful in all observed attempts (1 of 1, 3 of 3, respectively). All forages were for fish.

In contrast to the number of forage attempts, nestwatchers were able to document 101 prey deliveries to the nest (Appendix C, Table 15). The male delivered seven percent (n=7), and the female 93 percent (n=94). Eighty-two percent of those items were fish (n=83), 14 percent unknown (n=14), three percent birds (n=3), and one percent carrion (n=1).

Only 49 prey deliveries were identified to species. Ninety-four percent (n=46) were suckers, four percent (n=2) channel catfish, and one percent (n=1) perch.

Fort McDowell Breeding Area: 1999

Observation Period.—Observation datesFebruary 6 to May 5

Dawn-to-dusk hours413 hours

Total monitoring days/hours 65 days/ 680 hours

Eagle Identification.—MaleBlue VID band left leg, USFWS band right leg, adult plumage

Female Unbanded, adult plumage

One young disappeared from the nest on April 8 at six weeks of age. The second nestling fledged successfully on May 5.

Management Activities.—1. The Fort McDowell Yavapai Nation continues to restrict non-tribal member use of the river area, 2. The Fort McDowell Police visited the ABENWP contractors on nearly a daily basis, 3. ABENWP contractors were introduced to the Fort McDowell police in an orientation session held their first day in the field.

Human Activity.—Nestwatchers recorded 298 human activities within the BA (Appendix D, Table 16). Aircraft (small planes, helicopters, and jets) accounted for 84 percent (n=249), terrestrial activity 13 percent (n=39) of ten different types, and watercraft (canoes/kayaks) three percent (n=10).

Four activities elicited ten significant responses from the breeding pair. The bald eagles were restless to one small plane and one helicopter. The breeding pair flushed in response to one helicopter and one driver. Additionally, four small planes, one helicopter, and one canoe/kayak caused a left area response.

Food Habits.—Nestwatchers observed 36 forage attempts (Appendix D, Table 17). The male was successful in 48 percent (11 of 23), and the female in 100 percent (13 of 13). Most attempts were for fish (97 percent, n=35).

The breeding pair delivered 82 prey items to the nest (Appendix D, Table 18). The male delivered 42 percent (n=34), and the female 59 percent (n=48). Seventy-eight percent of those items were fish (n=64), 18 percent carrion (n=15), two percent mammals (n=2), and one percent birds (n=1).

Of the 42 prey items that could be identified to species (Appendix D, Table 19), 45 percent (n=19) were suckers, 33 percent (n=14) channel catfish, 19 percent (n=8) carp, and two percent (n=1) western cottontail rabbit.

Fort McDowell Breeding Area: 2000

Observation Period.—Observation datesFebruary 5 to May 7
Dawn-to-Dusk Hours276 hours
Total monitoring days/hours..... 44 days/ 445 hours

Eagle Identification.—Male.....Blue VID band left leg, USFWS band right leg, adult plumage
Female Unbanded, adult plumage

Management Activities.—1. The Fort McDowell Yavapai Nation continues to restrict non-tribal member use of the river area, 2. The Fort McDowell Police visited the ABENWP contractors on nearly a daily basis, 3. ABENWP contractors were introduced to the Fort McDowell police in an orientation session held their first day in the field.

Human Activity.—Nestwatchers recorded 91 human activities (Appendix D, Table 20). Aircraft (small planes and helicopters) represented 78 percent (n=71), terrestrial activities 18 percent (n=16) of four different types, and watercraft (kayaks) four percent (n=4).

One activity elicited six significant responses from the breeding pair. Hikers caused the adults to be restless, flush, and left area response on two occasions, each.

Food Habits.—The breeding pair foraged north of the nest area and out of the nestwatchers view. Thus, no forage events were observed. However, nestwatchers were able to record 42 prey deliveries to the nest (Appendix D, Table 21). The male delivered 76 percent (n=32), and the female 24 percent (n=10). Unknown prey items comprised of 52 percent (n=22), fish 43 percent (n=18), and birds and mammals two percent (n=2), each. No prey items were identified to species.

Horseshoe Breeding Area: 2000

Observation Period.—Observation datesFebruary 6 to May 7
Total monitoring days/hours..... 59 days/ 516 hours
Dawn-to-Dusk Hours334 hours

Eagle Identification.—Male..... Unbanded, adult plumage
FemaleUSFWS band right leg, adult plumage

Management Activities.—None.

Human Activity.— Nestwatchers recorded 577 human activities (Appendix E, Table 22). Aircraft (small planes, jets, and helicopters) represented six percent (n=36), terrestrial activities 94 percent (n=540) of five different types, and watercraft (kayaks) less than one percent (0.2 percent, n=1).

Most activities (93 percent, n=535) were vehicles passing on FS road 269. Four activities elicited six significant responses from the breeding pair. The bald eagles were restless to three jets, flushed in response to one hiker and one agency worker, and left the area in response to one helicopter.

Food Habits.—The breeding pair foraged north and south of the nest area and out of the nestwatchers view. Thus, no forage events were observed. However, nestwatchers recorded 63 prey deliveries to the nest (Appendix E, Table 23). The male delivered 71 percent (n=45), the female 22

percent (n=14), and an unknown adult six percent (n=4). Fish comprised 68 percent (n=43), unknown items 30 percent (n=19), and birds two percent (n=1). No prey items were identified to species.

Luna Breeding Area: 1999

Observation Period.—Observation dates May 7 to June 20
Total monitoring days/hours..... 37 days/ 380 hours
Dawn-to-Dusk Hours 127 hours
Eagle Identification.—Male Black VID band right leg, USFWS band left leg, adult plumage
Female Black VID band right leg, USFWS band left leg, adult plumage

During banding on April 18, both young were observed with irregular growth patterns in their pin feathers, and one had a distended colon. Both nestlings were returned to the nest until after consultation with a veterinarian. We reentered the nest on April 23, removed the nestling with the distended colon, and transferred it to Liberty Wildlife Rehabilitation. The nestling was returned to the nest on April 29.

On May 7, the nestwatchers discovered the rehabilitated nestling on the ground. The nestling was recovered, and flown to Liberty Wildlife Rehabilitation. Upon examination, the nestling suffered from a hyperextended tarsal ligament and was fitted with a modified orthopedic brace. After four months of rehabilitation, the ligament was not healing, and the nestling was developing bumblefoot on the other leg. This nestling was euthanized on July 20.

Management Activities.— 1. The USFS reinstated the seasonal breeding area closure around the nest, 2. The USFS posted signs along the fence separating the campground from the nest area, 3. Due to the unusual circumstance surrounding post-fledging mortality at this BA, nestwatchers monitored the site past the fledging dates, 4. Nestwatchers were stationed at the boat ramp to talk to fisherman launching boats, 5. The USFS closed Group Site A until the fledged nestlings dispersed from the nest area, 6. Nestwatchers posted flyers about the Luna Lake bald eagles on the bathroom doors and the bulletin boards.

Human Activity.—Nestwatchers recorded 38 human activities during their 37 days of observation (Appendix F, Table 24). Aircraft (helicopters and jets) represented 32 percent (n=12), terrestrial activities 66 percent (n=25) of six different types, and watercraft (small boats) three percent (n=1).

Six activities elicited seven significant responses from the breeding pair. The adults became restless to one fisherman, flushed in response to one helicopter and twice to agency workers. The birds left the area in response to one hiker, one nestwatcher, and one driver.

Food Habits.—Nestwatchers observed 67 forage attempts (Appendix F, Table 25). The male was successful in 48 percent (16 of 33), the female 61 percent (11 of 18), and an unknown adult 81 percent (13 of 16). The two forage items were fish (n=47) and birds (n=20).

Nestwatcher observed 15 prey items delivered to the nest (Appendix F, Table 26). The male and female delivered 40 percent each (n=6), and an unknown adult 20 percent (n=3). Fish made up 67

percent (n=10), 13 percent (n=2) unknown birds, and 20 percent (n=3) unknowns. No prey items were identified to species.

Luna Breeding Area: 2000

Observation Period.—Observation dates May 13 to June 11
Total monitoring days/hours..... 24 days/ 241 hours
Dawn-to-Dusk Hours 126 hours
Eagle Identification.—Male Black VID band right leg, USFWS band left leg, adult plumage
Female Black VID band right leg, USFWS band left leg, adult plumage

The Luna pair hatched three nestlings in 2000, although not all three fledged. On May 19, one nestling was discovered missing and presumed fledged. On May 20, nestwatchers observed the smallest nestling fall from the nest, and immediately attacked by coyotes. Upon investigation and retrieval of the smallest nestlings remains, nestwatchers and law enforcement officials found the remains of the first nestling (also presumed attacked by coyotes). The third nestling fledged successfully.

Management Activities.—1. The USFS reinstated the seasonal breeding area closure, 2. The USFS posted signs along the fence separating the campground from the nest area, 3. Due to the unusual circumstance surrounding post-fledging mortality at this BA, nestwatchers monitored the site past the fledging dates, 4. Nestwatchers were stationed at the boat ramp to talk to fisherman launching boats, 5. The USFS closed Group Site A until the fledged nestling dispersed from the nest area.

Human Activity.—Nestwatchers recorded 13 human activities during their 24 days of observation (Appendix F, Table 27). Military jets were 23 percent (n=3), and terrestrial activities were 77 percent (n=10) of three different types.

Two activities elicited three significant responses from the breeding pair. The adults flushed in response to a hiker, and twice to agency workers.

Food Habits.—Nestwatchers observed 15 forage attempts (Appendix F, Table 28). The male was successful in 20 percent (1 of 5), the female 67 percent (2 of 3), and an unknown adult 100 percent (7 of 7). The most common forage item was fish (n=13).

Nestwatchers observed 14 prey items delivered to the nest (Appendix F, Table 29). The male and female delivered 14 percent each (n=2), and an unknown adult 71 percent (n=10). Fish made up 71 percent (n=10), along with seven percent (n=1) unknown birds, and 21 percent (n=3) unknown. No prey items were identified to species.

Orme Breeding Area: 1999

Observation Period.—Observation dates March 29 to May 31
Total monitoring days/hours..... 51 days/513 hours
Eagle Identification.—Male Unbanded, adult plumage
Female Unbanded, adult plumage

Management Activities.—1. USFS personnel allowed the ABENWP contractors to camp and used the facilities and the Blue Point Ranger Station, 2. Salt River Pima Maricopa Indian Community has closed access downstream of the nest on the north side to non-tribal members.

Human Activity.—Nestwatchers recorded 837 human activities in 51 days of monitoring (Appendix G, Tables 30). Aircraft (small planes, helicopters, and jets) represented 66 percent (n=554), terrestrial activity five percent (n=38) of 10 different types, and watercraft (rafts/canoe/kayak, boaters, and tubers) 29 percent (n=242).

Six activities elicited 18 significant responses from the breeding pair. The bald eagles were restless to two helicopters, and flushed in response to two small planes, three helicopters, six rafts/canoes/kayaks, one fisherman, one hiker, and one researcher. One adult altered its flight path in response to an approaching helicopter, and a raft/canoe/kayak caused an adult to flush and interact with a great blue heron.

It is important to note, although nestwatchers recorded tubers in only 57 events, many of those events lasted hours with thousands of individuals in each event. In six weekends from April 29 to June 6, 18,245 people floated the lower Salt River (Appendix G, Table 31). On Memorial Day weekend alone (May 29 to 31), 14,751 tubers floated the lower Salt River near the nest.

The breeding pair appears habituated to high traffic from helicopters. In the 51 days of monitoring, nestwatchers recorded 194 helicopters with only six events eliciting a significant response (Appendix G, Table 32). Helicopters from Boeing, Sheriff's Department, and Television Stations comprised 46 percent (n=89).

Food Habits.—Nestwatchers observed seven forage attempts (Appendix G, Table 33). The male foraged for three items and the female four, all observed forage attempts were successful. The most common forage item was fish (86 percent, n=6).

The breeding pair delivered 61 prey items to the nest (Appendix G, Table 34). Eighty-two percent (n=50) were fish, 10 percent (n=6) unknown, three percent each (n=2) unknown birds and mammals, and two percent (n=1) unknown reptiles.

Only the 31 fish prey items identified to species. Fifty-eight percent (n=29) were suckers and four percent (n=2) channel catfish.

Orme Breeding Area: 2000

Observation Period.—Observation dates March 11 to April 23
Total monitoring days/hours..... 43 days/326 hours
Dawn-to-Dusk hours220 hours

Eagle Identification.—Male..... Unbanded, adult plumage
FemaleBlue VID band left leg, USFWS band right leg, adult plumage

The Orme pair was incubating in a new nest #6 on March 10. The nestlings hatched around March 31, and the nestlings died in the nest near April 20. On April 23 the adults abandoned the breeding attempt, and our efforts to determine the cause of failure were thwarted due to a large beehive below the nest.

Management Activities.—1. The Fort McDowell Yavapai Nation and the Salt River Pima Maricopa Indian Community have closed land access to non-tribal members. 2. The Fort McDowell Police visited the ABENWP contractors on nearly a daily basis, 3. ABENWP contractors were introduced to the Fort McDowell police in an orientation session held their first day in the field.

Human Activity.—Nestwatchers recorded 456 human activities (Appendix G, Table 35). Aircraft (small planes, jets, and helicopters) represented 76 percent (n=346), and terrestrial activities 24 percent (n=110) of 13 different types.

Six activities elicited ten significant responses from the breeding pair. The adults flushed to five drivers, and once each to a plane, helicopter, hiker, construction, and a researcher. Although numerous activities occurred at the practice rodeo grounds (less than 20 feet from the active nest) on a daily basis, the breeding pair appeared habituated to most activities, and only those that caused a reaction were recorded. In addition, various activities were audible from the BA that did not cause a reaction including: the Out of Africa loud speakers, shooting range, and HWY 87.

Nestwatchers attempted to identify the type of aircraft below the recommended 2000 foot ceiling (Appendix G, Table 36). Of the 355 reported aircraft, six percent (n=20) were World War II planes, eight percent (n=29) Apache helicopters, five percent (n=16) sheriff's department helicopters, and the majority were unknown planes (66 percent, n=234) and unknown helicopters (16 percent, n=56).

Food Habits.—Although no forages were documented, the nestwatchers observed 13 prey deliveries (Appendix G, Table 37). Most prey items were fish (54 percent, n=7), although the adults delivered two birds (15 percent), one mammal (eight percent), and three unknown items (23 percent). No prey items were identified to species.

Pleasant Breeding Area: 1999

Observation Period.—Observation datesFebruary 7 to May 12
Total monitoring days/hours..... 69 days/711 hours
Dawn-to-Dusk hours403 hours

Eagle Identification.—Male.....Blue VID band left leg, USFWS band right leg, adult plumage
FemaleUnbanded, adult plumage

Management Activities.—1. Maricopa County parks reinstated the seasonal closure around the active nest, 2. Maricopa County Parks and AGFD placed new closure signs at boat ramps, and roads entering the seasonal closure, 3. Maricopa County Parks marked closure boundaries with buoys, 4. Nestwatchers were stationed at the southern closure boundary on dawn-to-dusk days to educate recreationists on the closure and bald eagles, 4. Television crews broadcast the opening and closing dates of the closure.

Human Activity.—Nestwatchers recorded 479 human activities (Appendix H, Table 38). Aircraft (jets, helicopters, and ultra lights) represented 37 percent (n=178), fishermen 0.2 percent (n=1), and watercraft (boats and jet skis) 63 percent (n=300).

Seven activities elicited 75 significant responses by the breeding pair. The bald eagles were restless to 14 jets, 12 small planes, ten boats, six helicopters, five jet skis, two agency boats, and one ultra light. The breeding pair flushed in response to two jet skis, one boat, one agency boat, and one small plane. In addition, a small plane caused a left area response, and 19 responses were documented as "other" with no explanation offered.

Of the 8,513 watercraft that approached the southern buoy line, only 238 (3 percent) did not comply (agency boats omitted) (Appendix H, Table 39). Boats represented 88.2 percent (n=210), and 11.7 percent (n=28) jet skis. This is the best compliance since the closure was enacted in 1994 (Beatty et. al. 1995a, 1995b, 1997, 1998, 1999). Noncompliance has ranged as low as four percent in 1998 to 12 percent in 1997. Nestwatchers attribute this success to strict law enforcement, increased awareness, and recreationists regulating themselves.

Food Habits.—Nestwatchers observed 38 forage attempts (Appendix H, Table 40). The male was successful in 58 percent (18 of 31), the female 33 percent (2 of 6), and an unknown adult 100 percent (1 of 1). The most common forage item was fish (n=20), although birds (n=7) and unknown items (n=11) were captured.

The breeding pair delivered 72 prey items to the nest (Appendix H, Table 41). The male delivered 86 percent (n=62), the female 11 percent (n=8), and an unknown adult three percent (n=2). Sixty percent of those items (n=43) were fish, 22 percent (n=16) unknown, 13 percent (n=9) birds, four percent (n=3) mammals, and one percent (n=1) reptiles. No prey items were identified to species.

Pleasant Breeding Area: 2000

Observation Period.—Observation dates February 5 to May 27
Total monitoring days/hours 80 days/766 hours
Dawn-to-Dusk hours 471 hours

Eagle Identification.—Male Blue VID band left leg, USFWS band right leg, adult plumage
Female Unbanded, adult plumage

Management Activities.—1. Maricopa County parks reinstated the seasonal closure around the active nest, 2. Maricopa County Parks and AGFD placed new closure signs at boat ramps, and roads entering the seasonal closure, 3. Maricopa County Parks marked closure boundaries with buoys, 4. Nestwatchers were stationed at the southern closure boundary on dawn-to-dusk days to educate recreationists on the closure and bald eagles, 4. Television crews, and newspapers announced the opening and closing dates of the closure.

Human Activity.—Nestwatchers recorded 720 human activities (Appendix H, Table 42). Aircraft (planes, helicopters, jets, and ultra lights) represented 40 percent (n=285), and watercraft (boats and jet skis) 60 percent (n=435).

Seven activities elicited 25 significant responses from the breeding pair. Thirteen boats, four planes, three agency boats, two helicopters, one jet, one ultra light, and one water skier all caused a restless response.

Of the 7,711 watercraft that approach the southern buoy line, only 379 (5 percent) entered the closure (agency boats omitted) (Appendix H, Table 43). Boats represented 81.3 percent (n=308), and 18.7 percent (n=71) jet skis. This is consistent with the noncompliance percentages of previous years (Beatty et. al. 1995a, 1995b, 1997, 1998, 1999).

Food Habits.—Nestwatchers observed 12 forage attempts (Appendix H, Table 44). The male was successful in 100 percent (5 of 5), the female 40 percent (2 of 5), and an unknown adult 100 percent (2 of 2). The most common forage item was fish (n=10).

The breeding pair delivered 72 prey items to the nest. Seventy-one percent (n=51) were fish, three percent (n=2) birds, and 26 percent (n=19) unknown. The identity of the adults was not broken down to prey items. No prey items were identified to species.

Sheep Breeding Area: 1999

Observation Period.—Observation datesApril 3 to May 31
Total monitoring days/hours..... 46 days/461 hours

Eagle Identification.—MaleBlue VID band left leg, USFWS band right leg, adult plumage
Female Green VID band left leg, USFWS band right leg, adult plumage

Management Activities.—None.

Human Activity.—Nestwatchers recorded 32 human activities (Appendix I, Table 45). Aircraft (planes, helicopters, and jets) represented 78 percent (n=25), and terrestrial activities 22 percent (n=7) of five different types.

Two activities elicited two significant responses from the breeding pair. A hiker and agency biologists caused the adults to flush on one occasion, each.

Food Habits.—Nestwatchers observed three forage attempts. All attempts were made by the male and 100 percent successful (3 of 3). The male pirated prey from red-tail hawks on two occasions, and captured a rabbit from the ground once.

The breeding pair delivered 52 prey items to the nest (Appendix H, Table 46). Fifty-two percent (n=27) were delivered by the male, the female 44 percent (n=23), and an unknown adult four percent (n=2). Forty percent (n=21) of the prey items were fish, ten percent (n=5) birds, 15 percent (n=8) mammals, and 35 percent (n=18) unknown. No prey items were identified to species.

Sheep Breeding Area: 2000

Observation Period.—Observation datesFebruary 21 to May 6
Total monitoring days/hours..... 55 days/695 hours

Eagle Identification.—MaleBlue VID band left leg, USFWS band right leg, adult plumage
Female Green VID band left leg, USFWS band right leg, adult plumage

After falling from the nest on May 5, the Sheep nestling was taken to Liberty Wildlife Rehabilitation for severe dehydration on May 6. Even though the nestling had been feed the day prior, extremely hot temperatures and a lack of shade in the nest tree probably caused the dehydration. The nestling died three days later in rehabilitation.

Management Activities.—None.

Human Activity.—Nestwatchers recorded 22 human activities (Appendix I, Table 47). Aircraft (planes, helicopters, and jets) represented 68 percent (n=15), and terrestrial activities 32 percent (n=7) of four different types.

One activity elicited a significant responses from the breeding pair. Agency biologists caused the adults to flush while banding the nestling.

Food Habits.— Although the nestwatchers observed no forage attempts, the breeding pair delivered 35 prey items to the nest (Appendix I, Table 48). Eighty percent (n=28) were delivered by the male,

and 20 percent (n=7) by the female. Fifty-seven percent (n=20) of the prey items were fish, nine percent (n=3) birds, six percent (n=2) mammals, and 29 percent (n=10) unknown. No prey items were identified to species.

Sycamore Breeding Area: 1999

Observation Period.—Observation dates February 6 to May 25
Total monitoring days/hours..... 81 days/927 hours
Dawn-to-Dusk hours531 hours

Eagle Identification.—MaleBlue VID band left leg, USFWS band right leg, adult plumage
FemaleBlue VID band left leg, USFWS band right leg, adult plumage

On May 20, one nestling was attempting to fly when the branch it was perched on broke. The nestling grabbed a lower branch and righted itself. However, the nestling had not eaten since its sibling fledged two days prior. On May 21, we captured and hydrated the nestling, placing it back into the nest.

Overnight the nestling had fallen out a second time. On May 23, we recaptured the nestling on the ground, fed, hydrated, and placed it back into the nest. The nestling fledged the next morning.

Management Activities.—1. The Fort McDowell Yavapai Nation continues to restrict non-tribal member use of the river area, 2. The Fort McDowell Police visited the ABENWP contractors on nearly a daily basis, 3. ABENWP contractors were introduced to the Fort McDowell police in an orientation session held their first day in the field.

Human Activity.—Nestwatchers recorded 736 human activities (Appendix J, Table 49). Aircraft (planes, helicopters, and ultra lights) represented 76 percent (n=560), terrestrial activities 20 percent (n=146) of 13 different types, and watercraft (rafters and canoes/kayaks) four percent (n=30).

Fifteen activities elicited 63 significant responses from the breeding pair. The bald eagles were restless to seven drivers, four small planes, two researchers, one helicopter, one OHV, and one rafter. The breeding pair flushed in response to eight drivers, three OHV's, three dog catchers, two rafters, two researchers, and one each of the following: helicopter, horseback rider, police, canoe/kayak, miscellaneous recreationists, picnicker, hiker and swimmer. The adults left the area in response to four OHV's and one driver. In addition, 17 other responses were listed and varied in nature.

Nestwatchers recorded the number and type of aircraft below the recommended 2000 foot advisory. Of the 560 aircraft observed, small planes comprised of 68 percent (n=383), personal helicopters 18 percent (n=98), and apache helicopters 14 percent (n=76).

Food Habits.—Nestwatchers observed 14 forage attempts (Appendix J, Table 50). The male was successful in 57 percent (4 of 7), the female in 80 percent (4 of 5), and an unknown adult was unsuccessful twice. Most common forage item was fish (43 percent, n=6), although the adults were observed foraging for unknown prey (50 percent, n=7) and mammals (seven percent, n=1).

The breeding pair delivered 83 prey items to the nest (Appendix J, Table 51). The male delivered 54 percent (n=45), and the female 46 percent (n=38). Seventy-two percent (n=60) of the prey items were fish, seven percent (n=6) birds, six percent (n=5) mammals, and 15 percent (n=12) unknown.

Of the 41 prey items that could be identified to species, 38 percent (n=27) were suckers (Appendix J, Table 52). Other prey items include: carp (n=4), trout (n=4), ducks (n=2), small mouth bass (n=1), American coots (n=1), grebes (n=1), and western cottontail (n=1). The breeding adults were also successful in 50 percent (3 of 6) of their attempts to pirate prey from other species. Those species pirated from include: great blue herons (n=3), ravens (n=1), turkey vultures (n=1), and prairie falcons (n=1).

Sycamore Breeding Area: 2000

Observation Period.—Observation dates February 4 to March 10
Total monitoring days/hours..... 27 days/189 hours
Dawn-to-Dusk hours 115 hours

Eagle Identification.—MaleBlue VID band left leg, USFWS band right leg, adult plumage
FemaleBlue VID band left leg, USFWS band right leg, adult plumage

The breeding adults began abandoning the breeding attempt following a winter storm on March 3 to 6. The nestwatch contractors were moved on March 10 after two days of abandonment.

Management Activities.—1. The Fort McDowell Yavapai Nation continues to restrict non-tribal member use of the river area, 2. The Fort McDowell Police visited the ABENWP contractors on nearly a daily basis, 3. ABENWP contractors were introduced to the Fort McDowell police in an orientation session held their first day in the field.

Human Activity.— Nestwatchers recorded 116 human activities during their 27 days of monitoring (Appendix J, Table 53). Aircraft (planes and helicopters) represented 81 percent (n=94), terrestrial activities 20 percent (n=20) of 6 different types, and watercraft (canoes/kayaks) two percent (n=2).

Three activities elicited three significant responses from the breeding pair. The adults flushed in response to one small plane, one helicopter, and one gunshot.

Nestwatchers recorded the number and type of aircraft below the recommended 2000 foot advisory. Of the 94 aircraft observed, small planes comprised of 66 percent (n=62), Apache helicopters 19 percent (n=18), personal helicopters 12 percent (n=11), and sheriff's helicopters 3 percent (n=3).

Food Habits.—Due to the short duration of their stay, nestwatchers did not observe and forage attempts. One fish prey delivery was made by the male, and no prey items were identified to species.

Tonto Breeding Area: 1999

Observation Period.—Observation datesFebruary 7 to May 9
Dawn-to-dusk hours375 hours
Total monitoring days/hours..... 70 days/636 hours

Eagle Identification.—MaleBlue VID band left leg, USFWS band right leg, adult plumage
FemaleBlue VID band left leg, USFWS band right leg, adult plumage

Management Activities.—1. The newly constructed Indian Point campground remained closed throughout the breeding season, 2. The Southwestern Willow Flycatcher Closure limited recreational activities in the area.

Human Activity.—Nestwatchers recorded 65 human activities (Appendix K, Table 54). Aircraft (small planes, helicopters, and jets) represented 80 percent (n=52), and terrestrial activities 20 percent (n=13) of seven types.

Three activities elicited three significant responses from the breeding pair. Horseback riders caused the adults to flush when they road their horses under the nest tree to observe the bald eagles. An OHV and AGFD biologists caused the adults to flush once each.

Food Habits.—Although no forage attempts were observed by the nestwatchers, they did observe the adults returning from the vicinity of Roosevelt Lake with prey items.

The breeding adults delivered 71 prey items to the nest (Appendix K, Table 55). The majority was unknown (49 percent, n=35), 42 percent (n=30) fish, seven percent (n=5) mammals, and two percent (n=1) birds. No prey items were identified to species.

Tonto Breeding Area: 2000

Observation Period.—Observation datesFebruary 5 to April 3
Dawn-to-dusk hours256 hours
Total monitoring days/hours..... 42 days/403 hours

Eagle Identification.—MaleBlue VID band left leg, USFWS band right leg, adult plumage
FemaleBlue VID band left leg, USFWS band right leg, adult plumage

The Tonto breeding pair incubated two eggs for over 63 days. Upon collection, one egg appeared to be void of any embryonic matter though there were no apparent holes or cracks in the eggshell. We sent both eggs to the USFWS for contaminant studies.

Management Activities.— 1. The newly constructed Indian Point campground remained closed throughout the breeding season, 2. The Southwestern Willow Flycatcher Closure limited recreational activities in the area.

Human Activity.—Nestwatchers recorded 17 human activities (Appendix K, Table 56). Aircraft (small planes and helicopters) represented 47 percent (n=8), and terrestrial activities 53 percent (n=9) of four types.

Two activities elicited three significant responses from the breeding pair. AGFD biologists caused the birds to be restless while reading bands, and a left area response while collecting the addled eggs. A small plane caused the adults to be restless on one occasion.

Minimal flows in Tonto Creek allowed for substantial vehicle crossing at A-Cross road. However, due to low lake levels, Indian Point campground remained closed throughout the breeding season. The low lake levels, closed campground, and the failure of the breeding attempt all contributed to the low number of human activities recorded this year.

Food Habits.—Although they did not record any definitive forage attempts, all prey items were brought to the nest from the vicinity of the lake.

Nestwatchers only recorded six prey deliveries to the nest. Fish were identified as 83 percent (n=5), and 16 percent (n=1) unknown. No prey items were identified to species.

Tower Breeding Area: 1999

Observation Period.—Observation datesFebruary 6 to May 22
Total monitoring days/hours..... 68 days/686 hours

Eagle Identification.—MalePurple VID band left leg, USFWS band right leg, adult plumage
Female Unbanded, adult plumage

Management Activities.—1. The USFS reinstated a seasonal breeding area closure surrounding the nest area, 2. The USFS posted closure signs at the upstream and downstream access points to the Verde River, 3. The USFS hauled a trailer and restroom to the nestwatch camp.

Human Activity.—Nestwatchers recorded 559 human activities (Appendix L, Table 57). Aircraft (planes, jets, and helicopters) represented 47 percent (n=262), terrestrial activities 52 percent (n=292) of 11 different types, and watercraft (canoes/kayaks) less than one percent (0.9 percent, n=5).

Two activities elicited 13 significant responses from the breeding pair. Small planes caused the adults to be restless four times, flush twice, and a left area response once. Trains caused the adults to be restless once, flush three times, and a left area response twice.

Food Habits.—Nestwatchers observed 20 forage attempts in the BA (Appendix L, Table 58). The male was successful in 83 percent (10 of 12) of the attempts, and the female in 50 percent (4 of 8). Most common forage item was fish (70 percent, n=14), although the adults foraged for birds twice (10 percent), mammals and carrion once (five percent each), and an unknown twice (10 percent).

The breeding pair delivered 99 prey items to the nest (Appendix L, Table 59). The male delivered 62 percent (n=61), the female 34 percent (n=34), and an unknown adult four percent (n=4). Eighty-three percent (n=82) of the prey items were fish, two percent (n=2) birds and mammals each, three percent (n=3) carrion, and 10 percent (n=10) unknown.

Of the 44 prey items that could be identified to species, 55 percent (n=24) were suckers (Appendix L, Table 60). Other prey items include: brown trout (18 percent, n=8), channel catfish (16 percent, n=7), carp (nine percent, n=2), and bass species (two percent, n=1).

Tower Breeding Area: 2000

Observation Period.—Observation dates February 4 to May 16
Total monitoring days/hours..... 74 days/753 hours
Eagle Identification.—Male Purple VID band left leg, USFWS band right leg, adult plumage
Female Unbanded, adult plumage

One Tower nestling left the nest on May 17 after its sibling fledged on May 16. However, this nestling was not observed leaving the nest, nor flying in the BA. On May 18, we retrieved the nestling below the nest pinnacle, hydrated, fed, and placed the nestling above the nest on a cliff.

On May 22, the nestling remained on the cliff and had not been fed. We found the nestling the next day below the cliff near the Verde River, and took it to Liberty Wildlife Rehabilitation. After a month of rehab for a broken keel and clavicle, the nestling was released on June 14.

Management Activities.— 1. The USFS reinstated a seasonal breeding area closure surrounding the nest area, 2. The USFS posted closure signs at the upstream and downstream access points to the Verde River, 3. The USFS hauled a trailer and restroom to the nestwatch camp.

Human Activity.— Nestwatchers recorded 301 human activities (Appendix L, Table 61). Aircraft (planes and helicopters) represented 19 percent (n=57), terrestrial activities 80 percent (n=241) of 15 different types, and canoes one percent (n=3).

Three activities elicited three significant responses from the breeding pair. A hiker caused the adults to be restless, a railroad maintenance vehicle caused the adults to flush, and the train caused a left area response.

Food Habits.—Nestwatchers observed 23 forage attempts in the BA (Appendix L, Table 62). The male was successful in 77 percent (10 of 13), the female in 75 percent (6 of 8), and both adults in 50 percent (1 of 2). Most common forage item was fish (78 percent, n=18), although the adults foraged for birds and mammals twice each (nine percent each), and carrion once (four percent).

The breeding pair delivered 82 prey items to the nest (Appendix L, Table 63). The male delivered 72 percent (n=59), and the female 28 percent (n=23). Fifty-nine percent (n=48) of the prey items were fish, 29 percent mammals (n=24), five percent (n=4) birds, and seven percent (n=6) unknown.

Of the 53 prey items that could be identified to species, 77 percent (n=34) were suckers (Appendix L, Table 64). Other prey items include: trout (n=3), channel catfish (n=3), flathead catfish (n=2), carp (n=1), American Coots (n=3), grebes (n=1), western cottontails (n=1), squirrels (n=2), and cotton rats (n=3).

MANAGEMENT RECOMMENDATIONS

Bartlett Breeding Area

1. More descriptive signs need to be placed around closure boundaries warning individuals that the roads are closed.

Box Bar Breeding Area

1. Enlarge the current closure to include a part of the Needle Rock Recreation Area and the campground at the end of USFS Road 160.
2. Close USFS Road 160.
3. Increase closure signs on the western side of the Verde River near the river crossings. New closure signs should be in English and Spanish.
4. In the future, one ABENWP member at this site should be fluent in the Spanish language.
5. The dirt road from Hwy 87 which passes under the nest tree should be closed and signed annually.

Fort McDowell Breeding Area

1. Create opportunities to educate tribal members on the purpose of the ABENWP.
2. Communicate with Boeing and the Maricopa County Sheriff's Department on the location of bald eagle nests and their sensitivity during the breeding season. Educate the local airports and pilots on flight advisories and sensitivity of the bald eagles during the breeding cycle.
3. Continue the Orientation Session with Fort McDowell tribal officials and the police.
4. Provide brochures in Spanish.

Horseshoe Breeding Area

1. Better communication devices have to be purchased in the case of emergencies.
2. Although no closure exists, and one is not recommended, signs need to be placed in order to help educate the public to avoid the nest area.

Luna Breeding Area

1. Add more signs, or extended the fence between the nest area and the campgrounds.
2. Add trashcans in the parking lot for monofilament.
3. Continue to post closure notices on parking lot bathroom doors and bulletin boards.

Orme Breeding Area

1. Do not create a closure around this nest (nest #6). A closure (with signs and postings) would only draw attention into the nest area.
2. Continue to designate Orme as a high priority site if they continue to use this nest (nest #6).
3. Continue to coordinate with Desert Voyagers Rafting Company about the sensitivity of bald eagle during the breeding season.
4. Nestwatchers stationed at this site should be very tolerant of recreationists.
5. Contact Sheriff's Department, News Channels, and Boeing about repeated low-flying helicopters in the area.
6. Notify the rancher in the area about the nest location and the bald eagles.

7. Maintain land closures for non-tribal members.
8. Develop a plan to restore the health of the riparian ecosystem.
9. Develop more opportunities to educate tribal members on the bald eagles and management programs in the area.
10. Seasonal closures should be in place to protect the bald eagles.
11. Contact the owners of the rodeo grounds near the nest and inform them of the sensitivity of the bald eagles during the breeding cycle.

Pleasant Breeding Area

1. Always include the additional 14th buoy on the west side of the southern closure boundary.
2. Contact boat, jet ski, and ultra-light rental companies and ask that they inform customers about the closure.
3. Continue to have a patrol boat visit the northern buoy line daily.
4. Continue strict enforcement of closure boundaries.
5. Contact the coordinators of "Big Bass Days" and ask they institute measures to eliminate contestants entering the closure boundaries.

Sheep Breeding Area

1. Continue to monitor the BA.
2. Encourage a survey of prey populations and habitat analysis within the area to determine suitability.
3. Have future ABENWP notify USFS of the presence of cattle after March 15.
4. Cattle need to be removed from the drainage indefinitely to restore riparian health.

Sycamore Breeding Area

1. Limit the amount of wood cutting within the BA.
2. Rafting guides and companies should be contacted with regards to the sensitivity of the bald eagles during the breeding cycle.
3. Signs notifying recreating public to the closed area need to be added along Sycamore Creek, after the Fort McDowell Adventures.
4. Increase coordination with the police on camp location and observation points for faster response times.
5. Continue to restrict use of the Verde River to tribal members.
6. A comprehensive plan to restore the riparian vegetation of the lower Verde River would benefit the bald eagles.
7. Promote the program and nestwatcher involvement in Tribal functions during the breeding season.
8. A temporary closure restricting access to the nest area could be erected to eliminate disturbance to the breeding cycle.

Tonto Breeding Area

1. A BA closure needs to be enacted around the nest tree when the lake levels rise.
2. Fencing around the Tonto Creek Riparian Unit to encourage the regeneration of riparian vegetation.

3. Encourage future ABENWP contractors to become more involved in local community outreach efforts,

Tower Breeding Area

1. Move the big breeding area closure sign behind the trailer to prevent people from walking down the access point.
2. Continue to place river closure signs and lock appropriate gates on December 1st. Add additional signs and informative postings to all access points.
3. Communicate the importance of not blowing the train horn and not sending people to photograph the nest to the Verde Valley Train owners.
4. Continue the process of removing cattle from the riparian area.
5. Allow flexible closure boundaries to accommodate new nest locations.
6. Continue to keep Nestwatch camp in a high profile location.
7. Provide local recreation areas with Arizona Bald Eagle Nestwatch Information.
8. Continue to provide radios and add cellular telephones.

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APPENDIX A: 1999 – 2000 BALD EAGLE REPRODUCTION SUMMARIES

Table 1. Arizona bald eagle BA productivity summary, 1999.								
Breeding Area	Status ¹	Nest ²	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Alamo	F	4	1/22-2/1	1+	Failed 2/1-3/25.			
Bartlett*	S	2	1/4-16	2+	2/15-18	2	1	4/26
	One nestling died on 2/26 at 8 days old.							
Becker	F	1	3/6-10	1+	Failed 4/10. Male disappeared.			
Blue Point	S	7	1/5-2/1	1+	2/1-3/17	1+	1	5/13-6/14
Box Bar*	F	3	2/5-8	1+	3/14-15	1+	Failed 3/28.	
Camp Verde	U							
Canyon	O							
Cedar Basin	O							
Cibecue	S	2	2/2-4/16	2+	4/16-5/13	2+	1	>5/22
	One nestling disappeared 5/13 – 22 at four weeks old.							
Cliff	O							
Coldwater	F	8	1/4-2/1	1+	Failed 2/10-3/20.			
Coldwater 2	F	8	3/20-4/15	1+	Failed 4/15-5/13.			
Coolidge	F	2	2/2-3/18	1+	Failed 3/18-4/29.			
Devil's Post	U							
Doka*	S	1	<1/4	2+	1/8-2/5	2	2	3/29-30
Dupont	O							
East Verde	S	6	1/4-2/1	2+	2/1-3/17	2	2	5/13-6/14
Fort	S	17	1/4-2/1	2+	2/13	2	1	5/5
McDowell*	One eaglet disappeared on 4/6 at six weeks old.							
Granite Basin	F	1	2/2-3/18	1+	Failed 3/18-4/29.			
Horse Mesa	S	4	1/5-2/1	2+	2/1-3/17	2+	1	5/13-6/14
	One nestling disappeared 4/16 – 5/13 at four to eight weeks old.							
Horseshoe	S	11	1/4-2/1	2+	2/12-3/17	2	2	5/13-6/14
Ive's Wash	O							
Ladders	S	3	2/1-20	2+	2/20-3/15	2	2	5/13-6/14
Lone Pine	S	2	2/2-4/16	2+	2/2-4/16	2+	2	>5/13
Luna*	S	1	<3/12	2+	<3/12	2	1	5/20
	One eaglet taken to rehab on 5/7.							
Mule Hoof	U							
Orme	F	1	1/5-2/1	1+	Failed 2/1-3/17.			
Orme 2*	S	5	2/1-3/17	1+	3/17-23	1	1	6/12
Perkinsville	U							
Pinal	O							
Pinto	S	3	1/27-2/1	2+	2/9-3/18	2	2	5/13-6/14
Pleasant*	S	2	<1/14	2+	2/15-19	2	1	5/12
	One nestling died 3/5-15 at 2-3 weeks old.							
Redmond	F	5	2/21-3/18	1+	3/18-4/16	1	Failed 5/16-6/14	
San Carlos	O							
76	S	3	1/26-2/2	1+	2/2-3/18	1	1	5/13-6/14

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

² Nest numbers are from Hunt et al. 1992; Driscoll et al. 1992, 1995a, 1995b, 1997, 1998, 1999; Driscoll and Beatty 1994.

* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Breeding Area	Status ¹	Nest ²	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Sheep*	S	1	1/5-2/2	2+	2/8-3/18	2	1	5/29
One eaglet died 3/19-3/28.								
Suicide	S	1	<5/27	2+	<5/27	2+	2	<5/27
Sycamore*	S	2	1/8-19	2+	2/24	2	2	5/17, 5/24
Table Mountain	S	4	2/1-3/17	1+	3/17-4/15	1+	1	>6/14
Talkalai	F	4	1/5-2/2	1+	Failed 3/18-4/29.			
Tonto*	S	2	1/5-25	2+	2/20	2	2	5/7
Tower*	S	8	1/20-21	2+	2/25-2/26	2	2	5/21, 5/21-6/14
Winkelman	U							

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

² Nest numbers are from Hunt et al. 1992; Driscoll et al. 1992, 1995a, 1995b, 1997, 1998, 1999; Driscoll and Beatty 1994.

* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Number of BAs	40 ¹	Number of Active BAs	29
Number of Occupied BAs	36	Number of Failed Breeding Attempts	10
Number of Eggs	48+	Number of Successful Breeding Attempts	21
Nest Success = 21/36	0.58	Number of Young Hatched	40+
Mean Brood Size = 31/21	1.48	Number of Young Fledged	31
		Productivity = 0.58 x 1.48	0.86

¹ We are unsure if the Suicide nest site is a new BA, or an alternate nest within the San Carlos or Coolidge BA. Adult identification in 2000 will clarify.

Table 3. Arizona bald eagle BA productivity summary, 2000.								
Breeding Area	Status ¹	Nest ²	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Alamo	S	4	1/31 – 3/23	1+	1/31 – 3/23	1	1	5/15 – 6/9
			Nestling last observed at 8.5 weeks old on 5/15.					
Bartlett*	F	1	1/3 - 31	2		Failed 2/19		
Becker	O							
Blue Point	F	7	<1/17	1+		Failed 2/16		
Box Bar*	S	3	1/4 - 10	2+	2/14 - 18	2	2	5/4, 5/8
Camp Verde	U							
Canyon	O							
Cedar Basin	O							
Cibecue	O							
Cliff	O							
Coldwater	F	3	1/31 – 3/23	2+	3/23 – 4/17	2	Failed 5/15 - 6/9	
Coolidge	F	4	2/1 – 3/6	1+	3/8 – 4/3	1	Failed 4/3 – 5/10	
Devil's Post	U							
Doka*	S	1	< 1/3	2+	1/3 – 1/31	2	2	3/26, 4/8
Dupont	F	2	2/1 – 3/22	1+	3/22 - 4/20	1+	Failed 4/20 – 5/15	
East Verde	O							
Fort McDowell*	S	17	1/3 - 31	2+	2/11 - 12	2	2	4/29, 5/2
Granite Basin	O							
	S	4	1/17 – 2/1	2+	2/1 – 3/22	2	1	5/15 – 6/9
Horse Mesa			One nestling disappeared 4/20 – 5/15 at 5 to 8.5 weeks of age. Second nestling last observed on 5/15 at 8.5 weeks of age.					
Horseshoe*	S	11	1/3 – 31	2	3/3, 3/7	2	2	5/4 – 15, 5/15 – 6/9
			One nestling last observed on 5/7 at 9.5 to 10.5 weeks of age.					
Ive's Wash	O							
Ladders	O							
	F	2	2/1 – 3/22	2+	3/22 – 4/20	2	Failed 4/20 – 5/15	
Lone Pine			New 3 year old subadult in pair mid-season. Nestlings disappeared 4/20 – 5/15 at 4 – 8 weeks of age.					
Luna*	S	1	<2/27	3+	2/27 -3/30	3	1	6/3
			One nestling fell out of nest 5/15 – 5/19, one fell 5/20. Both eaten by coyotes on ground.					
Mule Hoof	U							
Orme*	F	6	<3/10	2+	3/28 -31	2	Failed 4/21	
Perkinsville	S	4	<3/23	1+	<3/27	1	1	5/15 – 6/9
	F	6	2/1 – 3/22	2+	3/22 - 30	2	Failed 5/15 – 6/9	
Pinal			Nestlings disappeared 5/15 – 6/9 at 6 – 9.5 weeks of age.					
Pinto	O							
Pleasant*	S	2	1/13 - 29	2+	2/28 – 3/2	2	2	5/23, 5/24
	S	5	1/17 – 2/1	1+	2/1 – 3/22	1	1	5/15 – 6/9
Redmond			Nestling last observed on 5/15 at 9 weeks of age.					
San Carlos	F	3	2/1 – 3/6	1+		Failed 3/22 – 4/3		
76	S	3	1/17 – 2/1	2+	2/1 -3/22	2	2	5/15 -6/9

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

² Nest numbers are from Hunt et al. 1992; Driscoll et al. 1992, 1995a, 1995b, 1997, 1998, 1999; Driscoll and Beatty 1994.

* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 3 (continued).

Breeding Area	Status ¹	Nest ²	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Sheep*	F	1	1/17 – 2/1	1+	3/13 - 16	1+	Failed 5/5	
Nestling taken to rehab on 5/5 for severe dehydration. Died 5/8.								
Suicide	S	1	1/17 – 2/1	3+	3/10 - 22	3	3	>5/15
Sycamore*	F	3	1/3 - 31	1+	Failed 3/10			
Table Mountain	F	4	1/31 – 3/23	1+	Failed 3/23 – 4/17			
Talkalai	F	7	<3/22	1+	Failed 3/22 – 4/3			
Tonto*	F	2	1/17 – 2/1	2	Failed 4/3			
Tower*	S	9	<2/4	2+	3/12 - 17	2	2	5/17
One young taken to rehab after falling from nest on 5/17. Released back into BA on 6/14.								
Winkelman	U							

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

² Nest numbers are from Hunt et al. 1992; Driscoll et al. 1992, 1995a, 1995b, 1997, 1998, 1999; Driscoll and Beatty 1994.

* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 4. Arizona bald eagle productivity summary, 2000.

Number of BAs	41	Number of Active BAs	27
Number of Occupied BAs	37	Number of Failed Breeding Attempts	14
Number of Eggs	45+	Number of Successful Breeding Attempts	13
Nest Success = 13/37	0.35	Number of Young Hatched	36+
Mean Brood Size = 22/13	1.69	Number of Young Fledged	22
		Productivity = 0.35 x 1.69	0.59

APPENDIX B: BARTLETT BREEDING AREA SUMMARY

Table 5. Observed human activity and bald eagle behavior, Bartlett BA, Arizona, 1999.

Type	N ¹	W	R	F	L	X	U	D-D ² Total	Total
Small Plane	267	45	5	5	--	3	8	239 (77.9%)	333 (75.1%)
Helicopter	12	26	1	--	1	1	1	24 (7.8%)	42 (9.5%)
Canoe/Kayak	5	8	2	1	1	--	--	13 (4.2%)	17 (3.8%)
Driver	7	2	--	1	--	1	1	8 (2.6%)	12 (2.7%)
Gunshots	5	2	1	1	--	--	--	8 (2.6%)	9 (2.0%)
OHV	4	1	1	--	--	--	1	6 (2.0%)	7 (1.6%)
Hiker	5	2	--	--	--	--	--	4 (1.3%)	7 (1.6%)
Fisherman	4	1	--	--	--	--	--	1 (0.3%)	5 (1.1%)
Birder	1	--	--	--	--	1	--	2 (0.7%)	2 (0.4%)
Camper	1	--	--	--	--	--	--	0	1 (0.23%)
Researcher	--	--	--	1	--	--	--	0	1 (0.23%)
Agency Worker	1	--	--	--	--	--	--	0	1 (0.23%)
Hunter	1	--	--	--	--	--	--	1 (0.3%)	1 (0.23%)
Shooter	1	--	--	--	--	--	--	0	1 (0.23%)
Dog Walker	1	--	--	--	--	--	--	0	1 (0.23%)
Dog Barking	1	--	--	--	--	--	--	0	1 (0.23%)
Boat w/ Generator	--	--	--	1	--	--	--	0	1 (0.23%)
Rafter	--	--	--	--	1	--	--	1 (0.3%)	1 (0.23%)
Total	316	87	10	10	3	6	11	307	443

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left area, X=bird flies from perch to attend nest, U=unknown.

² D-D Total=Observations on dawn-to-dusk days.

Table 6. Observed forage event and success, Bartlett BA, Arizona, 1999.

Sex	Fish		Mammals		Unknown		Total	
	E ¹	S ² -U	E	S-U	E	S-U	E	S-U
Male	10	8-2	1	1-0	2	2-0	13	11-2
Female	11	11-0	--	--	--	--	11	11-0
Total	21	19-2	1	1-0	2	2-0	24	24-2

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 7. Observed prey types delivered to the nest, Bartlett BA, Arizona, 1999.

Sex	Fish	Birds	Mammals	Herps	Unknown	Carrion	Total
Male	50	2	4	2	9	2	69 (82.1%)
Female	9	--	--	--	3	--	12 (14.2%)
Unknown	--	2	--	--	1	--	3 (3.5%)
Total	59 (70.2%)	4 (4.8%)	4 (4.8%)	2 (2.4%)	13 (15.5%)	2 (2.4%)	84

Table 8. Observed prey items delivered to the nest, Bartlett BA, Arizona, 1999.

Sex	Fish					Birds	Mammals		Total
	S ¹	CC	LMB	BL	BC	AC	R	SQ	
Male	22	5	4	2	1	2	1	1	38 (84.4%)
Female	4	--	--	--	--	--	1	--	5 (11.1%)
Unknown	--	--	--	--	--	2	--	--	2 (4.4%)
Total	26	5	4	2	1	4	2	1	45

¹ S=sucker spp., CC=channel catfish, LMB=largemouth bass, BL=bluegill, BC=black crappie, AC=American coot, R=western cottontail, SQ=rock squirrel.

Table 9. Observed human activity and bald eagle behavior, Bartlett BA, Arizona, 2000.

Type	N ¹	W	U	D-D ² Total	Total
Small Plane	4	--	2	3 (27.3%)	6 (40.0%)
OHV	3	--	--	3 (27.3%)	3 (20.0%)
Hunter	2	--	1	3 (27.3%)	3 (20.0%)
Fisherman	--	1	--	0	1 (6.6%)
4x4	--	1	--	1 (9.1%)	1 (6.6%)
Canoe/Kayak	1	--	--	1 (9.1%)	1 (6.6%)
Total	10	2	3	11	15

¹ Bald eagle behavior, N=none, W=watched, U=unknown.

² D-D Total=Observations on dawn-to-dusk days.

APPENDIX C: BOX BAR BREEDING AREA SUMMARIES

Table 10. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 1999.

Type	N ¹	W	R	F	L	B	U	Total
Small Plane	36	7	1	--	--	--	8	53 (34.9%)
Helicopter	18	7	1	--	--	--	5	31 (20.4%)
OHV	11	4	1	--	--	--	--	16 (10.5%)
Driver	11	4	--	--	--	--	--	15 (9.9%)
Horseback Rider	10	1	--	1	--	1	1	14 (9.2%)
Fisherman	7	--	--	--	--	--	--	7 (4.6%)
Canoe/Kayak	5	1	--	--	--	--	--	6 (3.9%)
Hiker	4	--	--	--	--	--	--	4 (2.6%)
Gunshots	--	--	3	--	--	--	1	4 (2.6%)
Tuber	1	--	--	--	--	--	1	2 (1.3%)
Agency Worker	--	--	--	--	1	--	--	1 (0.6%)
Total	103	24	6	1	1	1	16	152

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

Table 11. Weekend use of USFS road 160, Box Bar BA, Arizona, 1999.

Clearance	Vehicles	Occupants
High (Capable of crossing River)	57 (27.0%)	136 (26.8%)
Moderate	93 (44.1%)	238 (46.9%)
Low (Incapable of crossing River)	56 (26.5%)	128 (25.2%)
Unknown	5 (23.7%)	5 (1.0%)
Total	211	507

Table 12. Observed forage event and success, Box Bar BA, Arizona, 1999.

Sex	Fish		Unknown		Total	
	E ¹	S ² -U	E	S-U	E	S-U
Male	3	3-0	--	--	3	3-0
Female	2	2-0	2	1-1	4	3-1
Total	5	5-0	2	1-1	7	6-1

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 13. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2000.

Type	N ¹	W	R	F	L	U	Total
Small Plane	149	24	--	--	--	93	266 (54.3%)
Helicopter	28	15	1	1	1	15	61 (12.5%)
Hiker	23	3	--	1	--	16	43 (8.8%)
Horseback Rider	19	6	--	1	--	5	31 (6.3%)
OHV	13	2	--	--	1	7	23 (4.7%)
Fisherman	10	4	--	--	--	7	21 (4.3%)
Driver	7	1	--	3	--	9	20 (4.1%)
Canoe	2	2	--	--	--	2	6 (1.2%)
Gunshots	2	2	2	--	--	--	6 (1.2%)
Agency Worker	--	--	1	3	--	--	4 (0.8%)
Swimmer	2	--	--	--	--	--	2 (0.4%)
Researcher	--	--	1	--	--	--	1 (0.2%)
Shooter	--	--	--	1	--	--	1 (0.2%)
Birder	--	--	--	1	--	--	1 (0.2%)
Cycler	1	--	--	--	--	--	1 (0.2%)
Tuber	--	--	--	--	--	1	1 (0.2%)
Picnicker	1	--	--	--	--	--	1 (0.2%)
Total	257	59	5	11	2	155	489

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

Table 14. Method of entry into closure, Box Bar BA, Arizona, 2000.

Date	Foot	Motorized/Horseback	Total
February	8 (10.8%)	21 (28.0%)	29 (19.4%)
March	11 (14.9%)	26 (34.6%)	37 (24.8%)
April	50 (67.6%)	25 (33.3%)	75 (50.3%)
May	5 (6.8%)	3 (4.0%)	8 (5.4%)
Total	74 (49.7%)	75 (50.3%)	149

Table 15. Observed prey types delivered to the nest, Box Bar BA, Arizona, 2000.

Sex	Fish	Birds	Unknown	Carrion	Total
Male	4	--	3	--	7 (6.9%)
Female	79	3	11	1	94 (93.1%)
Total	83 (82.2%)	3 (3.0%)	14 (13.9%)	1 (0.9%)	101

APPENDIX D: FORT McDOWELL BREEDING AREA SUMMARIES

Table 16. Observed human activity and bald eagle behavior. Fort McDowell BA, Arizona, 1999.

Type	N ¹	W	R	F	L	X	B	U	D-D ² Total	Total
Small Plane	86	47	1	--	4	1	1	52	150 (69.1%)	192 (64.4%)
Helicopter	12	27	1	1	1	1	--	11	29 (13.4%)	54 (18.1%)
Driver	7	4	--	1	--	--	--	5	14 (6.5%)	17 (5.7%)
Canoe/Kayak	--	8	--	--	1	--	1	--	7 (3.2%)	10 (3.4%)
Picnicker	1	4	--	--	--	--	--	--	4 (1.8%)	5 (1.7%)
Gunshots	3	--	--	--	--	1	--	1	5 (2.3%)	5 (1.7%)
Fisherman	--	3	--	--	--	--	--	--	3 (1.4%)	3 (1.0%)
Jets	--	2	--	--	--	--	--	1	1 (0.4%)	3 (1.0%)
Camper	--	3	--	--	--	--	--	--	3 (1.4%)	3 (1.0%)
Agency Worker	--	--	--	--	--	2	--	--	1 (0.4%)	2 (0.7%)
Horseback Riders	1	--	--	--	--	--	--	--	0	1 (0.3%)
Researcher	--	--	--	--	--	1	--	--	0	1 (0.3%)
Shooter	--	1	--	--	--	--	--	--	0	1 (0.3%)
OHV	--	--	--	--	--	1	--	--	1 (0.4%)	1 (0.3%)
Total	110	99	2	2	6	7	1	70	217	298

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left area, X=other (no explanation offered), B=bird not in area, U=unknown.

² D-D Total=Observations on dawn-to-dusk days.

Table 17. Observed forage event and success. Fort McDowell BA, Arizona, 1999.

Sex	Fish		Mammals		Total	
	E ¹	S ² -U	E	S-U	E	S-U
Male	23	11-12	--	--	23	11-12
Female	12	12-0	1	1-0	13	13-0
Total	35	23-12	1	1-0	36	24-12

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 18. Observed prey types delivered to the nest, Fort McDowell BA, Arizona, 1999.

Sex	Fish	Birds	Mammals	Carrion	Total
Male	23	1	1	9	34 (41.5%)
Female	41	--	1	6	48 (58.5%)
Total	64 (78.0%)	1 (1.2%)	2 (2.4%)	15 (18.3%)	82

Table 19. Observed prey items delivered to the nest, Fort McDowell BA, 1999.

Sex	Fish			Mammals	Total
	S ¹	CC	Carp	R	
Male	5	5	4	1	15 (35.7%)
Female	14	9	4	--	27 (64.3%)
Total	19	14	8	1	42

¹ S=sucker spp., CC=channel catfish, C=carp, R=western cottontail.

Table 20. Observed human activity and bald eagle behavior, Fort McDowell BA, Arizona, 2000.

Type	N ¹	W	R	F	L	Total
Aircraft	68	3	--	--	--	71 (78.0%)
Kayakers	4	--	--	--	--	4 (4.4%)
Gunshots	3	--	--	--	--	3 (3.3%)
Hikers	--	2	2	2	2	8 (8.8%)
Chainsaws	3	--	--	--	--	3 (3.3%)
Horseback Riders	1	1	--	--	--	2 (2.2%)
Total	79	6	2	2	2	91

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

Table 21. Observed prey types delivered to the nest, Fort McDowell BA, Arizona, 2000.

Sex	Fish	Birds	Mammals	Unknown	Total
Male	13	1	1	17	32 (76.2%)
Female	5	--	--	5	10 (23.8%)
Total	18 (42.9%)	1 (2.4%)	1 (2.4%)	22 (52.4%)	42

APPENDIX E: HORSESHOE BREEDING AREA SUMMARY

Table 22. Observed human activity and bald eagle behavior, Horseshoe BA, Arizona, 2000.

Type	N ¹	W	R	F	L	Total
Cars/Trucks	453	--	--	--	--	453 (78.5%)
OHV	82	--	--	--	--	82 (14.2%)
Small Plane	24	1	--	--	--	25 (4.3%)
Jets	7	--	3	--	--	10 (1.7%)
Hiker	--	1	--	1	--	2 (0.3%)
Agency Worker	1	--	--	1	--	2 (0.3%)
Helicopter	--	--	--	--	1	1 (0.2%)
Hunter/ Gunshot	--	1	--	--	--	1 (0.2%)
Kayakers	--	1	--	--	--	1 (0.2%)
Total	567	4	3	2	1	577

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

Table 23. Observed prey types delivered to the nest, Horseshoe BA, Arizona, 2000.

Sex	Fish	Birds	Unknown	Total
Male	33	1	11	45 (71.4%)
Female	8	--	6	14 (22.2%)
Unknown	2	--	2	4 (6.4%)
Total	43 (68.3%)	1 (1.6%)	19 (30.2%)	63

APPENDIX F: LUNA BREEDING AREA SUMMARIES

Table 24. Observed human activity and bald eagle behavior. Luna BA, Arizona, 1999.

Type	N ¹	W	R	F	L	X	B	U	Total
Hiker	1	7	--	--	1	--	3	--	12 (31.6%)
Helicopter	2	--	--	1	--	--	2	1	6 (15.8%)
Jets	--	2	--	--	--	--	--	4	6 (15.8%)
Agency Worker	2	--	--	2	--	--	--	--	4 (10.5%)
Nestwatcher	--	2	--	--	1	1	--	--	4 (10.5%)
Fisherman	--	2	1	--	--	--	--	--	3 (7.9%)
Birder	--	1	--	--	--	--	--	--	1 (2.6%)
Driver	--	--	--	--	1	--	--	--	1 (2.6%)
Boater	--	--	--	--	--	--	1	--	1 (2.6%)
Total	5	14	1	3	3	1	6	5	38

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left area, X=other (no explanation offered), B=bird not in area, U=unknown.

Table 25. Observed forage event and success. Luna BA, Arizona, 1999.

Sex	Fish		Birds		Total	
	E ¹	S ² -U	E	S-U	E	S-U
Male	22	14-8	11	2-9	33	16-17
Female	14	10-4	4	1-3	18	11-7
Unknown	11	11-0	5	2-3	16	13-3
Total	47	35-12	20	5-15	67	40-27

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 26. Observed prey types delivered to the nest. Luna BA, Arizona, 1999.

Sex	Fish	Birds	Unknown	Total
Male	4	--	2	6 (40.0%)
Female	4	1	1	6 (40.0%)
Unknown	2	1	--	3 (20.0%)
Total	10 (66.7%)	2 (13.3%)	3 (20.0%)	15

Table 27. Observed human activity and bald eagle behavior. Luna BA, Arizona, 2000.

Type	N ¹	W	F	B	Total
Hiker	5	--	1	--	6 (46.2%)
Agency Worker	--	1	2	--	3 (23.1%)
Jets	3	--	--	--	3 (23.1%)
Construction	--	--	--	1	1 (7.7%)
Total	8	1	3	1	13

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

Table 28. Observed forage event and success, Luna BA, Arizona, 2000.

Sex	Fish		Mammals		Unknown		Total	
	E ¹	S ² -U	E	S-U	E	S-U	E	S-U
Male	4	1-3	1	0-1	--	--	5	1-4
Female	3	2-1	--	--	--	--	3	2-1
Unknown	6	6-0	--	--	1	1-0	7	7-0
Total	13	9-4	1	0-1	1	1-0	15	10-5

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

Table 29. Observed prey types delivered to the nest, Luna BA, Arizona, 2000.

Sex	Fish	Birds	Unknown	Total
Male	2	--	--	2 (14.3%)
Female	1	--	1	2 (14.3%)
Unknown	7	1	2	10 (71.4%)
Total	10 (71.4%)	1 (7.1%)	3 (21.4%)	14

¹ Bald eagle behavior: N=none, W=watched, R=restless, F=flushed, X=other (a=alerted light path, b=increased with great blue heron), B=bird not in area, U=unknown.

Table 31. Observed watercraft use, Luna BA, Arizona, 1999.

Type	W/Watched		F/Flushed		X/Other		Total
	4/29 - 5/28	5/29 - 7/1	4/29 - 5/28	5/29 - 7/1	4/29 - 5/28	5/29 - 7/1	
Tubers	324	1473	1077	1612	374	1473	1813
Canoe/Kayak	337	20	18	375	247	34	606
Raft	183	7	4	194	1	31	174
Boat	2	--	--	2	--	--	2
Total	826	1477	1099	1989	322	1478	1824

Table 32. Observed helicopter activity and bald eagle behavior, Luna BA, Arizona, 1999.

Type	N	W	R	F	X	B	U	Total
Civilian	28	47	1	1	14	13	6	107 (24.1%)
Military	22	39	--	--	--	7	1	68 (28.1%)
Search	4	2	1	2	--	3	1	13 (2.7%)
News	1	3	--	--	--	--	1	5 (2.0%)
Total	55	91	2	3	14	19	9	194

¹ Bald eagle behavior: N=none, W=watched, R=restless, F=flushed, X=other (a=increased with great blue heron), B=bird not in area, U=unknown.

APPENDIX G: ORME BREEDING AREA SUMMARIES

Table 30. Observed human activity and bald eagle behavior, Orme BA, Arizona, 1999.

Type	N ¹	W	R	F	X	B	U	Total
Small Plane	248	42	--	2	--	53	14	359 (42.9%)
Helicopter	66	94	2	3	1a	19	9	194 (23.2%)
Raft/Canoe/Kayak	122	28	--	6	1b	23	3	183 (21.9%)
Tuber	31	10	--	--	--	16	--	57 (6.8%)
Fisherman	12	1	--	1	--	--	--	14 (1.7%)
Swimmer	6	3	--	--	--	2	--	11 (1.3%)
Driver	2	1	--	--	--	--	--	3 (0.4%)
Boater	--	2	--	--	--	--	--	2 (0.2%)
Dog	2	--	--	--	--	--	--	2 (0.2%)
Hiker	1	--	--	1	--	--	--	2 (0.2%)
Horseback Rider	1	1	--	--	--	--	--	2 (0.2%)
Gunshots	--	--	--	--	--	--	1	1 (0.1%)
Jets	1	--	--	--	--	--	--	1 (0.1%)
OHV	--	1	--	--	--	--	--	1 (0.1%)
Rancher	1	--	--	--	--	--	--	1 (0.1%)
Researcher	--	--	--	1	--	--	--	1 (0.1%)
Total	493	183	2	14	2	115	28	837

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, X=other (a=altered flight path, b=interacted with great blue heron), B=bird not in area, U=unknown.

Table 31. Observed watercraft use, Orme BA, Arizona, 1999.

Type	Watercraft				People			
	4/29 – 5/28	5/29 - 31	6/4 - 5	Total	4/29 – 5/28	5/29 - 31	6/4 - 5	Total
Tuber	334	14751	1037	16122	334	14751	1037	16122
Canoe/Kayak	337	20	18	375	547	34	25	606
Raft	183	7	4	194	1429	51	34	1514
Boat	2	--	--	2	3	--	--	3
Total	856	14778	1059	16693	2313	14836	1096	18245

Table 32. Observed helicopter activity and bald eagle behavior, Orme BA, Arizona, 1999.

Type	N ¹	W	R	F	X	B	U	Total
Civilian	36	47	1	1	1a	13	6	105 (54.1%)
Military	25	39	--	--	--	3	1	68 (35.1%)
Sheriff	4	5	1	2	--	3	1	16 (8.2%)
News	1	3	--	--	--	--	1	5 (2.6%)
Total	66	94	2	3	1	19	9	194

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, X=other (a=interacted with great blue heron), B=bird not in area, U=unknown.

Table 33. Observed forage event and success. Orme BA, Arizona, 1999.

Sex	Fish		Unknown		Total	
	E ¹	S ² -U	E	S-U	E	S-U
Male	2	2-0	1	1-0	3	3-0
Female	4	4-0	--	--	4	4-0
Total	6	6-0	1	1-0	7	7-0

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 34. Observed prey types delivered to the nest. Orme BA, Arizona, 1999.

Sex	Fish	Birds	Mammals	Reptile	Unknown	Total
Male	15	2	2	--	5	24 (39.3%)
Female	35	--	--	1	1	37 (60.7%)
Total	50 (82.0%)	2 (3.3%)	2 (3.3%)	1 (1.6%)	6 (9.8%)	61

Table 35. Observed human activity and bald eagle behavior. Orme BA, Arizona, 2000.

Type	N ¹	W	F	Total
Small Plane	189	56	1	246 (53.9%)
Helicopter	51	47	1	99 (21.7%)
Driver	30	5	5	40 (8.8%)
Hiker	20	1	1	22 (4.8%)
Shooter	13	1	--	14 (3.1%)
OHV	10	2	--	12 (2.6%)
Horseback Rider	3	2	--	5 (1.1%)
Construction	4	--	1	5 (1.1%)
Fisherman	4	--	--	4 (0.9%)
Picnicker	2	--	--	2 (0.4%)
Swimmer	2	--	--	2 (0.4%)
Researcher	--	--	1	1 (0.2%)
Mining	1	--	--	1 (0.2%)
Cycler	1	--	--	1 (0.2%)
Jets	--	1	--	1 (0.2%)
Photographer	1	--	--	1 (0.2%)
Total	331	115	10	456

¹ Bald eagle behavior, N=none, W=watched, F=flushed.

Table 36. Observed aircraft activity and bald eagle behavior, Orme BA, Arizona, 2000.

Type	N ¹	W	R	F	B	U	Total
Unknown plane	177	49	1	--	5	2	234 (63.4%)
WW II plane	12	7	--	1	--	--	20 (5.4%)
Unknown helicopter	31	23	1	--	--	1	56 (15.2%)
Apache helicopter	14	14	--	--	--	1	29 (7.9%)
Sheriff's helicopter	6	10	--	--	--	--	16 (4.3%)
Total	240	103	2	1	5	4	355

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

Table 37. Observed prey types delivered to the nest, Orme BA, Arizona, 2000.

Sex	Fish	Birds	Mammals	Unknown	Total
Male	6	1	--	3	10 (76.9%)
Female	1	--	--	--	1 (7.7%)
Unknown	--	1	1	--	2 (15.4%)
Total	7 (53.8%)	2 (15.4%)	1 (7.7%)	3 (23.1%)	13

¹ Bald eagle behavior, N=none, W=watched, F=flushed

APPENDIX H: PLEASANT BREEDING AREA SUMMARIES

Table 38. Observed human activity and bald eagle behavior. Pleasant BA, Arizona, 1999.

Type	N ¹	W	R	F	L	X	U	D-D ²	Total	Total
Boats	108	62	10	1	--	7	31	151	219 (45.7%)	
Small Plane	72	15	12	1	1	4	27	87	132 (27.6%)	
Agency Boats	25	20	2	1	--	2	5	36	55 (11.5%)	
Jet-Ski	9	5	5	2	--	3	2	17	26 (5.4%)	
Helicopter	7	3	6	--	--	2	4	11	22 (4.6%)	
Jets	2	--	14	--	--	1	1	5	18 (3.8%)	
Fisherman	1	--	--	--	--	--	--	1	1 (0.2%)	
Ultralight	1	2	1	--	--	--	2	4	6 (1.3%)	
Total	225	107	50	5	1	19	72	313	479	

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left area. X=other (no explanation offered), U=unknown.

² D-D Total=Observations on dawn-to-dusk days.

Table 39. Watercraft compliance at the southern closure boundary. Pleasant BA, Arizona, 1999.

Date	Boats at Closure	Boats in Closure	Agency Boats in Closure	Jet Skis at Closure	Jet Skies in Closure	Total
2/7 – 14	262	22	9	24	2	319
2/19 – 28	863	34	6	98	3	1004
3/5 – 14	847	38	9	61	1	956
3/19 – 28	1241	37	5	127	9	1419
4/2 – 11	729	15	11	39	--	794
4/16 – 25	1371	34	9	204	6	1624
4/31 – 5/9	1842	27	10	438	6	2323
5/11 – 5/12	95	3	--	34	1	133
Total	7250 (84.5%)	210 (2.4%)	59 (0.7%)	1025 (11.9%)	28 (0.3%)	8572

Table 40. Observed forage event and success. Pleasant BA, Arizona, 1999.

Sex	Fish		Birds		Unknown		Total	
	E ¹	S ² -U	E	S-U	E	S-U	E	S-U
Male	19	13-6	5	4-1	7	1-6	31	18-13
Female	--	--	2	1-1	4	1-3	6	2-4
Unknown	1	1-0	--	--	--	--	1	1-0
Total	20	14-6	7	5-2	11	2-9	38	21-17

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 41. Observed prey types delivered to the nest, Pleasant BA, Arizona, 1999.

Sex	Fish	Birds	Mammals	Reptile	Unknown	Total
Male	40	9	1	1	11	62 (86.1%)
Female	3	--	1	--	4	8 (11.1%)
Unknown	--	--	1	--	1	2 (2.8%)
Total	43 (59.7%)	9 (12.5%)	3 (4.2%)	1 (1.4%)	16 (22.2%)	72

Table 42. Observed human activity and bald eagle behavior, Pleasant BA, Arizona, 2000.

Type	N ¹	W	R	U	Total
Boats	156	70	13	50	289 (40.1%)
Small Plane	140	15	4	90	249 (34.6%)
Agency Boats	41	33	3	14	91 (12.6%)
Jet-Ski	20	18	--	15	53 (7.4%)
Helicopter	7	--	2	7	16 (2.2%)
Jets	3	4	1	5	13 (1.8%)
Ultralight	3	--	1	3	7 (1.0%)
Waterskier	--	--	1	--	1 (0.1%)
Sailboat	1	--	--	--	1 (0.1%)
Total	371	140	25	184	720

¹ Bald eagle behavior, N=none, W=watched, R=restless, U=unknown.

Table 43. Watercraft compliance at the southern closure boundary, Pleasant BA, Arizona, 2000.

Date	Boats at Closure	Boats in Closure	Agency Boats in Closure	Jet Skis at Closure	Jet Skies in Closure	Total
2/5 – 13	489	23	5	33	4	554
2/18 – 27	578	24	9	60	--	671
3/3 – 12	564	40	3	46	5	658
3/17 – 26	1302	41	14	120	6	1483
3/31 – 4/9	987	51	11	158	7	1214
4/14 – 23	750	48	8	119	11	936
4/28 – 5/9	675	39	13	166	21	914
5/12 – 5/27	1080	42	20	205	17	1364
Total	6425 (82.4%)	308 (4.0%)	83 (1.1%)	907 (11.6%)	71 (0.9%)	7794

Table 44. Observed forage event and success, Pleasant BA, Arizona, 2000.

Sex	Fish		Birds		Unknown		Total	
	E ¹	S ² -U	E	S-U	E	S-U	E	S-U
Male	5	5-0	--	--	--	--	5	5-0
Female	3	2-1	1	0-1	1	0-1	5	2-3
Unknown	2	2-0	--	--	--	--	2	2-0
Total	10	9-1	1	0-1	1	0-1	12	9-3

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

APPENDIX I: SHEEP BREEDING AREA SUMMARIES

Table 45. Observed human activity and bald eagle behavior, Sheep BA, Arizona, 1999.

Type	N ¹	W	F	U	D-D ² Total	Total
Small Plane	12	6	--	--	12 (57.1%)	18 (56.3%)
Helicopter	2	4	--	--	5 (23.8%)	6 (18.8%)
Barking Dog	2	--	--	--	0	2 (9.4%)
Gunshot	1	1	--	--	2 (9.5%)	2 (9.4%)
Jets	--	1	--	--	0	1 (3.1%)
Tire Blowout	--	--	--	1	0	1 (3.1%)
Hiker	--	--	1	--	1 (4.8%)	1 (3.1%)
Agency Worker	--	--	1	--	1 (4.8%)	1 (3.1%)
Total	17	12	2	1	21	32

¹ Bald eagle behavior, N=none, W=watched, F=flushed, U=unknown.

² D-D Total=Observations on dawn-to-dusk days.

Table 46. Observed prey types delivered to the nest, Sheep BA, Arizona, 1999.

Sex	Fish	Birds	Mammals	Unknown	Total
Male	13	2	6	6	27 (51.9%)
Female	7	3	2	11	23 (44.2%)
Unknown	1	--	--	1	2 (3.8%)
Total	21 (40.4%)	5 (9.6%)	8 (15.4%)	18 (34.6%)	52

Table 47. Observed human activity and bald eagle behavior, Sheep BA, Arizona, 2000.

Type	N ¹	W	F	U	Total
Small Plane	7	4	--	--	11 (50.0%)
Helicopter	2	1	--	1	4 (18.2%)
Ranchers	--	3	--	--	3 (13.6%)
OHV	1	1	--	--	2 (9.1%)
Agency Worker	--	--	1	--	1 (4.6%)
Gunshot	--	1	--	--	1 (4.6%)
Total	10	10	1	1	22

¹ Bald eagle behavior, N=none, W=watched, F=flushed, U=unknown.

Table 48. Observed prey types delivered to the nest, Sheep BA, Arizona, 2000.

Sex	Fish	Birds	Mammals	Unknown	Total
Male	17	2	2	7	28 (80.0%)
Female	3	1	--	3	7 (20.0%)
Total	20 (57.1%)	3 (8.6%)	2 (5.7%)	10 (28.6%)	35

APPENDIX J: SYCAMORE BREEDING AREA SUMMARIES

Table 49. Observed human activity and bald eagle behavior, Sycamore BA, Arizona, 1999.

Type	N ¹	W	R	F	L	X	U	D-D ² Total	Total
Small Plane	348	24	4	--	--	3	4	250 (59.2%)	383 (52.0%)
Helicopter	156	11	1	1	--	4	1	53 (12.6%)	174 (23.6%)
Driver	24	3	7	8	1	4	--	31 (7.4%)	47 (6.4%)
OHV	18	--	1	3	3	1	--	23 (5.5%)	26 (3.5%)
Horseback Rider	22	--	--	1	--	--	--	13 (3.1%)	23 (3.1%)
Rafter	15	1	1	2	--	1	--	11 (2.6%)	20 (2.7%)
Researcher	--	5	2	2	--	3	1	7 (1.7%)	13 (1.8%)
Police	11	--	--	1	--	--	--	9 (2.1%)	12 (1.6%)
Canoe/Kayak	9	--	--	1	--	--	--	7 (1.7%)	10 (1.4%)
Misc. Recreationist	6	1	--	1	--	--	--	6 (1.4%)	8 (1.1%)
Dog Catcher	1	--	--	3	--	--	--	0	4 (0.5%)
Fisherman	4	--	--	--	--	--	--	4 (0.9%)	4 (0.5%)
Picnicker	3	--	--	1	--	--	--	4 (0.9%)	4 (0.5%)
Ultra light	1	2	--	--	--	--	--	3 (0.7%)	3 (0.4%)
Hiker	1	--	--	1	--	--	--	1 (0.2%)	2 (2.7%)
Agency Worker	1	--	--	--	--	--	--	0	1 (0.1%)
SRP	--	--	--	--	--	1	--	0	1 (0.1%)
Swimmer	--	--	--	1	--	--	--	0	1 (0.1%)
Total	620	47	16	26	4	17	6	422	736

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left area, X=various other responses, U=unknown.

² D-D Total=Observations on dawn-to-dusk days.

Table 50. Observed forage event and success, Sycamore BA, Arizona, 1999.

Sex	Fish		Mammals		Unknown		Total	
	E ¹	S ² -U	E	S-U	E	S-U	E	S-U
Male	1	1-0	1	1-0	5	2-3	7	4-3
Female	5	4-1	--	--	--	--	5	4-1
Unknown	--	--	--	--	2	0-2	2	0-2
Total	6	5-1	1	1-0	7	2-5	14	8-6

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 51. Observed prey types delivered to the nest, Sycamore BA, Arizona, 1999.

Sex	Fish	Birds	Mammals	Unknown	Total
Male	29	6	2	8	45 (54.2%)
Female	31	--	3	4	38 (45.7%)
Total	60 (72.3%)	6 (7.2%)	5 (6.0%)	12 (14.5%)	83

Table 52. Observed prey items delivered to the nest, Sycamore BA, 1999.

Sex	Fish				Birds			Mammals	Total
	S ¹	C	T	SMB	D	A	G	R	
Male	11	3	4	--	2	1	1	--	22 (53.6%)
Female	16	1	--	1	--	--	--	1	19 (46.3%)
Total	27	4	4	1	2	1	1	1	41

¹ S=sucker spp., C=carp, T=trout, SMB=smallmouth bass, D=duck, A=American coot, G=grebe, R=western cottontail.

Table 53. Observed human activity and bald eagle behavior, Sycamore BA, Arizona, 2000.

Type	N ¹	W	F	U	Total
Small Plane	57	3	1	1	62 (53.4%)
Helicopter	26	4	1	1	32 (27.6%)
Driver	6	--	--	--	6 (5.2%)
Gunshot	3	--	1	--	4 (3.4%)
Shaman	3	1	--	--	4 (3.4%)
OHV	2	--	--	--	2 (1.7%)
Horseback Rider	2	--	--	--	2 (1.7%)
Canoe/Kayak	1	1	--	--	2 (1.7%)
Hiker	2	--	--	--	2 (1.7%)
Total	102	9	3	2	116

¹ Bald eagle behavior, N=none, W=watched, F=flushed, U=unknown.

APPENDIX K: TONTO BREEDING AREA SUMMARIES

Table 54. Observed human activity and bald eagle behavior. Tonto BA, Arizona, 1999.

Type	N ¹	W	R	F	U	D-D ² Total	Total
Small Plane	9	13	--	--	17	26 (66.6%)	39 (60.0%)
Helicopter	1	5	--	--	5	2 (5.1%)	11 (16.9%)
Domestic Dogs	1	3	--	--	--	3 (7.6%)	4 (6.1%)
OHV	2	--	--	1	--	3 (7.6%)	3 (4.6%)
Hiker	1	--	--	--	1	2 (5.1%)	2 (3.1%)
Jet	--	--	--	--	2	1 (2.6%)	2 (3.1%)
Driver	--	1	--	--	--	1 (2.6%)	1 (1.5%)
Horseback Riders	--	--	1	--	--	0	1 (1.5%)
Tuber	--	1	--	--	--	1 (2.6%)	1 (1.5%)
Agency Worker	--	--	--	1	--	0	1 (1.5%)
Total	14	23	1	2	25	39	65

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

² D-D Total=Observations on dawn-to-dusk days.

Table 55. Observed prey types delivered to the nest, Tonto BA, Arizona, 1999.

Sex	Fish	Birds	Mammals	Unknown	D-D ¹ Total	Total
Male	21	1	5	27	34 (79.1%)	54 (76.1%)
Female	6	--	--	6	7 (16.3%)	12 (16.9%)
Unknown	3	--	--	2	2 (4.7%)	5 (7.0%)
Total	30 (42.2%)	1 (1.4%)	5 (7.0%)	35 (49.3%)	43	71

¹ D-D Total=Observations on dawn-to-dusk days.

Table 56. Observed human activity and bald eagle behavior. Tonto BA, Arizona, 2000.

Type	N ¹	W	R	L	Total
Small Plane	2	1	1	--	4 (23.5%)
Helicopter	--	4	--	--	4 (23.5%)
Hunter	3	--	--	--	3 (17.6%)
Domestic Dogs	2	--	--	--	2 (11.7%)
Horseback Riders	1	1	--	--	2 (11.7%)
Agency Worker	--	--	1	1	2 (11.7%)
Total	8	6	2	1	17

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

APPENDIX L: TOWER BREEDING AREA SUMMARIES

Table 57. Observed human activity and bald eagle behavior, Tower BA, Arizona, 1999.

Type	N ¹	W	R	F	L	X	U	D-D ² Total	Total
Small Plane	189	28	4	2	1	3	24	140 (46.4%)	251 (44.9%)
Trains	72	67	1	3	2	3	6	91 (30.1%)	154 (27.6%)
Vehicles	66	19	--	--	--	--	6	29 (9.6%)	91 (16.3%)
Sightseer	16	1	--	--	--	--	--	12 (4.0%)	17 (3.0%)
Gunshot	3	2	--	--	--	--	6	11 (3.6%)	11 (2.0%)
Helicopter	5	4	--	--	--	--	1	7 (2.3%)	10 (1.8%)
Agency Worker	9	--	--	--	--	--	--	0	9 (1.6%)
Watercraft	--	5	--	--	--	--	--	5 (1.7%)	5 (0.9%)
Domestic Dogs	1	--	--	--	--	1	--	2 (0.7%)	2 (0.4%)
OHV	2	--	--	--	--	--	--	2 (0.7%)	2 (0.4%)
Sonic Boom	2	--	--	--	--	--	--	0	2 (0.4%)
Cattle	1	--	--	--	--	--	--	1 (0.3%)	1 (0.2%)
Swimmer	1	--	--	--	--	--	--	1 (0.3%)	1 (0.2%)
Hiker	1	--	--	--	--	--	--	1 (0.3%)	1 (0.2%)
Jet	1	--	--	--	--	--	--	0	1 (0.2%)
Photographer	1	--	--	--	--	--	--	0	1 (0.2%)
Total	370	126	5	5	3	7	43	302	559

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left area, X=other (no explanation offered), U=unknown.

² D-D Total=Observations on dawn-to-dusk days.

Table 58. Observed forage event and success, Tower BA, Arizona, 1999.

Sex	Fish		Birds		Mammals		Carrion		Unknown		Total	
	E ¹	S ² -U	E	S-U	E	S-U	E	S-U	E	S-U	E	S-U
Male	11	10-1	--	--	1	0-1	--	--	--	--	12	10-2
Female	3	3-0	2	0-2	--	--	1	1-0	2	0-2	8	4-4
Total	14	13-1	2	0-2	1	0-1	1	1-0	2	0-2	20	14-6

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 59. Observed prey types delivered to the nest, Tower BA, Arizona, 1999.

Sex	Fish	Birds	Mammals	Carrion	Unknown	Total
Male	48	2	2	2	7	61 (61.6%)
Female	30	--	--	1	3	34 (34.3%)
Unknown	4	--	--	--	--	4 (4.0%)
Total	82 (82.9%)	2 (2.0%)	2 (2.0%)	3 (3.0%)	10 (10.1%)	99

Table 60. Observed prey items delivered to the nest, Tower BA, 1999.

Sex	Fish					Total
	S ¹	BT	CC	C	B	
Male	14	5	6	2	1	28 (63.6%)
Female	10	3	1	2	--	16 (36.3%)
Total	24	8	7	4	1	44

¹ S=sucker spp., C=carp, BT=brown trout, CC=channel catfish, C=carp, B=bass sp..

Table 61. Observed human activity and bald eagle behavior, Tower BA, Arizona, 2000.

Type	N ¹	W	R	F	L	U	Total
Trains	98	37	--	--	1	1	137 (45.5%)
R.R. Vehicle	50	13	--	1	--	5	69 (22.9%)
Small Plane	30	13	--	--	--	3	46 (15.3%)
Helicopter	2	9	--	--	--	--	11 (3.7%)
Driver	4	2	--	--	--	1	7 (2.3%)
Cattle	2	4	--	--	--	--	6 (2.0%)
Hiker	4	1	1	--	--	--	6 (2.0%)
Agency Worker	2	1	--	--	--	--	3 (1.0%)
Canoe	2	1	--	--	--	--	3 (1.0%)
OHV	1	1	--	--	--	--	2 (0.7%)
Rancher	1	1	--	--	--	--	2 (0.7%)
A.P.S. Crew	--	2	--	--	--	--	2 (0.7%)
Shooter	--	2	--	--	--	--	2 (0.7%)
Gunshot	1	--	--	--	--	--	1 (0.3%)
Fisherman	--	1	--	--	--	--	1 (0.3%)
Loud Bang	--	--	--	--	--	1	1 (0.3%)
Train Horn	1	--	--	--	--	--	1 (0.3%)
Photographer	--	1	--	--	--	--	1 (0.3%)
Total	198	89	1	1	1	11	301

¹ Bald eagle behavior, N=none, W=watched, R=restless, F=flushed, L=left area, X=other (no explanation offered), U=unknown.

² D-D Total=Observations on dawn-to-dusk days.

Table 62. Observed forage event and success, Tower BA, Arizona, 2000.

Sex	Fish		Birds		Mammals		Carrion		Total	
	E ¹	S ² -U	E	S-U	E	S-U	E	S-U	E	S-U
Male	10	7-3	1	1-0	1	1-0	1	1-0	13	10-3
Female	8	6-2	--	--	--	--	--	--	8	6-2
Both	--	--	1	1-0	1	0-1	--	--	2	1-1
Total	18	13-5	2	2-0	2	1-1	1	1-0	23	17-6

¹ E=A Single forage event, not the number of attempts during one attempt.

² S-U=Successful – Unsuccessful forage events.

Table 63. Observed prey types delivered to the nest. Tower BA. Arizona. 2000.

Sex	Fish	Birds	Mammals	Unknown	Total
Male	34	3	17	5	59 (72.0%)
Female	14	1	7	1	23 (28.0%)
Total	48 (58.5%)	4 (4.9%)	24 (29.3%)	6 (7.3%)	82

Table 64. Observed prey items delivered to the nest. Tower BA. 2000.

Sex	Fish					Birds		Mammals			Total
	S ¹	T	CC	C	FC	AC	G	WC	SQ	CR	
Male	22	2	1	1	2	2	1	1	1	2	35 (66.0%)
Female	12	1	2	--	--	1	--	--	1	1	18 (34.0%)
Total	34	3	3	1	2	3	1	1	2	3	53

¹ S=sucker spp., T=trout, CC=channel catfish, C=carp, FC=flathead catfish, AC=American coot, G=grebe, WC=western cottontail, SQ=Squirrel, CR=cotton rat.