ARIZONA BALD EAGLE NESTWATCH PROGRAM: 2002 SUMMARY REPORT

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James T. Driscoll

INTRODUCTION

In 1978 the U.S. Fish and Wildlife Service (USFWS) listed the bald eagle (*Haliaeetus leucocephalus*) as endangered under the Endangered Species Act (ESA) as amended (1973) in 43 states (including Arizona), and threatened in 5 others (USFWS 1982). In Alaska, the USFWS did not list the species and it does not occur in Hawaii. The USFWS downlisted the bald eagle to threatened in 1995 (USFWS 1995), and has proposed to delist in the future (USFWS 1999). Until delisting, the bald eagle remains protected under the ESA. Thereafter, the Airborne Hunting Act, the Bald and Golden Eagle Protection Act, the Lacey Act, the Migratory Bird Treaty Act, and Arizona Revised Statute Title 17 will protect the species.

Due to 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 become more informed on the affects of human recreation to bald eagles in these areas, the demand for protective management also increases. In 1978, U.S. Forest Service (USFS) biologists and 2 Maricopa Audubon Society volunteers began to monitor these areas near Bartlett Reservoir. This monitoring effort eventually expanded to 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 3 goals: conservation, data collection, and education. Due to high recreation pressures along some of Arizona's lakes and rivers, land management agencies enact seasonal closures to protect the bald eagles during the breeding cycle. Nestwatchers interact with members of the public, 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 biologists to intervene in those situations, and eliminate/reduce the threat.

As new BAs were discovered, interagency coordination became more important. To enhance coordination, increase communication, and provide oversight for Arizona bald eagle management, 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 2002. Detailed reports of each monitored BA are centralized at AGFD, and distributed to the appropriate land and wildlife management agencies.

STUDY AREA

Nestwatchers monitored BAs along creeks, lakes, reservoirs, and rivers throughout Arizona (Fig. 1). All monitored BAs (except the Luna BA) were in the central part of the state. We monitored BAs as far north as Tower, near Clarkdale; south to Orme, on the lower Verde/Salt rivers; east to Luna, near Alpine; and west to Lynx Lake, near Prescott. Elevations of the monitored BAs ranged from Luna at 2409 m (7900 ft) to Orme at 439 m (1440 ft).

Most bald eagles breed in central Arizona at elevations between 329 m (1080 ft) and 1719 m (5640 ft). Vegetation commonly associated within this area is comprised of the Upper and Lower Sonoran Life Zones, which includes riparian habitats and transition areas of both zones (Brown 1982). Representative vegetation includes Arizona sycamore (*Platanus wrightii*), blue palo verde (*Cercidium floridum*), Fremont cottonwood (*Populus fremontii*), Goodding willow (*Salix gooddingii*), mesquite (*Prosopis* spp.), saguaro (*Carnegiea gigantea*), and tamarisk (*Tamarix pentandra*). Pinyon pine (*Pinus* spp.) and juniper (*Juniperus* spp.) are found in the transition areas.

The Luna BA is 1 of 2 known Arizona bald eagle BAs found at high elevations. Vegetation commonly associated within this area is comprised of the Montane-Conifer Forest zone and includes ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), and quaking aspen (*Populus tremuloides*) (Brown 1982).

METHODS

We selected the monitored BAs by weighing the levels of recreation activity and necessary management needs. These included BAs with seasonal closures (Box Bar, Ladders, Luna, Lynx, Pleasant, and Tower), those without (Fort McDowell, Needle Rock, Orme, Sycamore, and Tonto), and as supplementary information (Doka, Granite Reef, and Rodeo).

In autumn 2001, we advertised the ABENWP contract positions through the American Ornithologists Union Newsletter, American Birding Associations Job Listing, AGFD Internet site, Society for Conservation Biology web page, and at university and college job placement services nationwide. Presentations, brochures, and word-of-mouth also contributed to the pool of applicants.

We held 2 orientation meetings, and several question and answer sessions for the selected ABENWP contractors. The first 2 meetings offered an introduction to the program, background and the ABENWP's role in bald eagle management, and an explanation of data forms and emergency protocols. After the orientation meetings, the nestwatchers chose partners, BAs, and were taken into the field. The question and answer sessions occurred after the first 10 day work period, and before every other 10 day period thereafter. In these sessions we discussed filling out forms, consistency in data collection, problems and issues, and the requirements for the report. Additional problems or questions were handled on an individual basis.

Fieldwork began February 8, 2002, and continued until all nestlings fledged. Teams of 2 maintained a 10 day on 4 day off schedule. During each 10 day work period observations were conducted from dawn-to-dusk, to cover times of high recreation use and to assess the habitat use of the breeding pair.

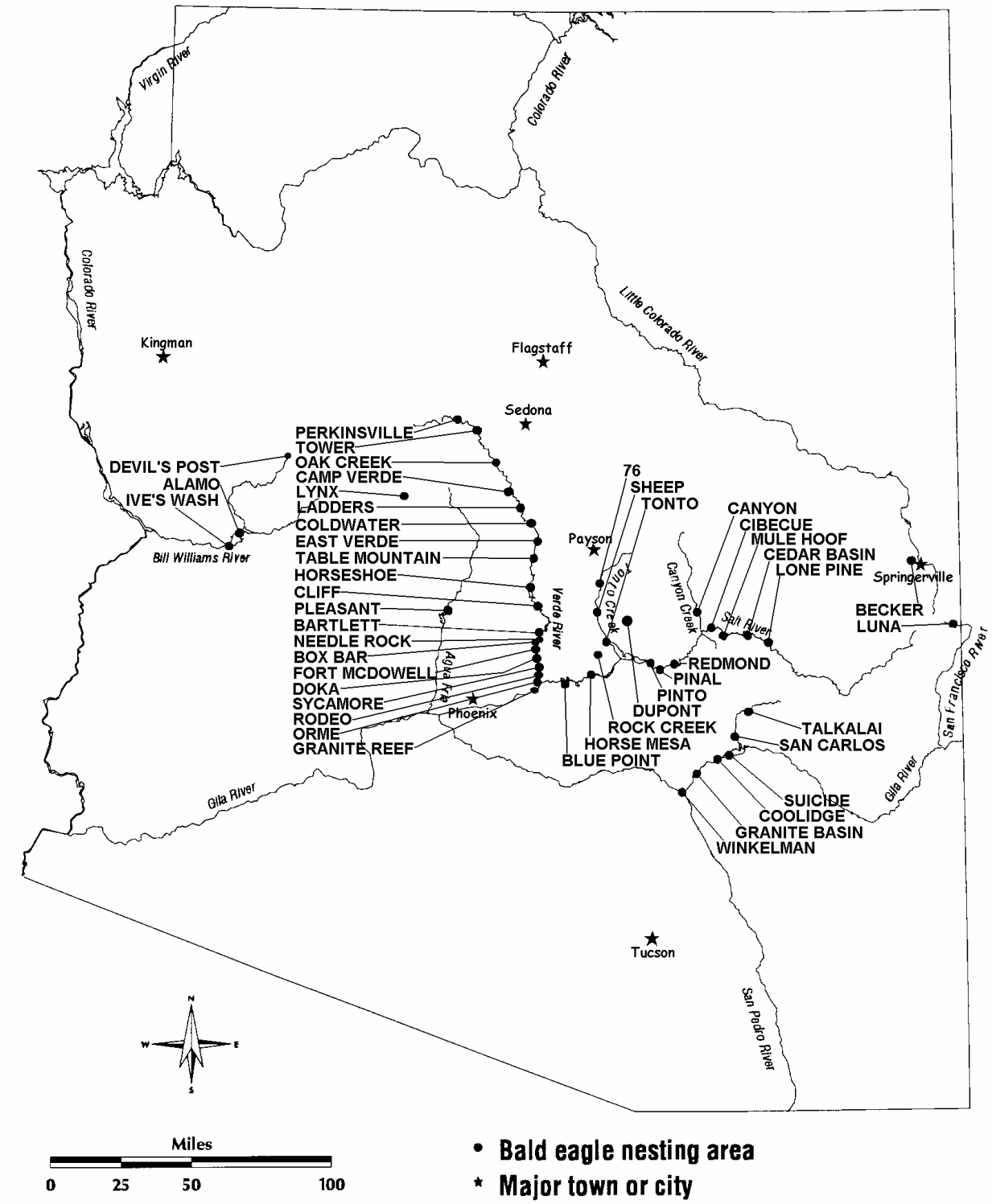

Figure 1. Location of known bald eagle BAs in Arizona, 2002.

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 7 categories: none, watched, restless, flushed, left area, bird not in area, and unknown. If the bald eagles performed their normal activities without acknowledging the human activity, nestwatchers recorded a "none" response. "Watched" was a bald eagle looking in the direction of the human activity without displaying any other observable reaction. If the bald eagle vocalized and/or moved noticeably without leaving the nest or perch, nestwatchers recorded "restless." If a bald eagle left its location quickly in response to a human activity, nestwatchers recorded a "flushed" response. "Left area" is when a bald eagle became intolerant of the human activity and flies away. They recorded a "not in area" if a bald eagle was not present at the time of the activity, an "unknown" response if the bald eagle could not be observed, 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 significant responses.

At the Lake Pleasant, Box Bar, and Needle Rock 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 and Needle Rock BAs within 1.0 km of the active nest, nestwatchers only recorded the human activities and the bald eagle's associated behavior that occurred within the closure boundaries.

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

Contrary to past years, the contractors focused data collection on habitat use of the breeding pair. This will help land and wildlife managers assess impacts of projects occurring within breeding area boundaries. Due to this shift in focus, some information collected historically has been de-emphasized. These include: interspecific interactions, low flying aircraft reporting, prey delivered to nest, and other wildlife observed. In addition, nestwatchers were instructed to use the weekdays to document habitat use within the breeding pairs home range. This prohibited them from consistently monitoring breeding pair behaviors at the nest during that time. Because of this, comparisons to past

reports may not be appropriate. Data collection on weekends remained the same with dawn to dusk monitoring of the breeding pair's behaviors at the nest.

Because 2002 is the pilot year for this new emphasis, we will not summarize habitat use in this report. Reporting methods were not standardized in order to determine the best method for doing so in future years. However, this year's individual site reports contain valuable information that should not be discounted. Future summary reports will include a description of perch associated parameters including: type, location, vegetation, shade, distance to water, water morphology, bald eagle activity, and time observed at these locations.

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

RESULTS AND DISCUSSION

PRODUCTIVITY OVERVIEW

The 2002 Arizona bald eagle breeding season produced the highest number of young on record (Appendix A, Tables 1 and 2). Out of 34 breeding attempts, 23 pairs successfully fledged 37 young.

PROGRAM

The ABENWP monitored 15 BAs in 2002. Those BAs monitored include: Bartlett, Box Bar, Doka, Fort McDowell, Granite Reef, Ladders, Luna, Lynx, Needle Rock, Orme, Pleasant, Rodeo, Sycamore, Tonto, and Tower. The final status of monitored BAs was: 2 failed, 13 successful, and 20 young fledged.

Some BAs were not monitored the entire season due to breeding attempt failures (Bartlett, Lynx), subsequent moving of contractors to new sites (Ladders, Needle Rock), and supplemental monitoring (Doka, Granite Reef, Rodeo). Therefore observation days vary, and all collected data reflects only those instances observed during the documented time frame. Since the Doka, Granite Reef, and Rodeo BAs were monitored only for supplemental information, and the Bartlett BA failed early in the ABEWNP field season; these summaries are not included in this report.

BREEDING AREA SUMMARIES

Box Bar Breeding Area

Observation Period. – Observation dates .....February 8 to May 7.
Total monitoring days/hours..... 68 days/744 hours.

Eagle Identification.
Male – Blue VID band "5/G" left leg, USFWS band right leg, adult plumage (Pleasant 1994 nestling).
Female – Blue VID band "5/H" left leg, USFWS band right leg, adult plumage (Pleasant 1994 nestling).

Intervention. – During banding on March 22, one Box Bar nestling was discovered with a cross-beak, which caused the connective skin tissue to partially cover the right eye. The nestling was taken to Liberty Wildlife Rehabilitation, where veterinarians researched corrective surgery. The nestling underwent minor surgery to restore vision in the right eye, and extensive therapy to correct the cross-beak. However, the consistent care involved in keeping the beak aligned would keep this nestling from being released. The nestling was euthanized on August 18.

Management Activities.
- The USFS reinstated the seasonal BA closure.
- The owners of Rio Verde Ranch allowed ABENWP to camp and monitor from their lawn.
- The USFS placed Sensitive Wildlife Area signs every 100 feet along the eastern perimeter of the closure.
- ABENWP contractors were active in educating the public visiting the Rio Verde Ranch and the campground at the end of USFS road 161.
- The remaining nestling was fitted with a satellite transmitter at 9 weeks of age.

Human Activity. – Nestwatchers recorded 515 human activities within the closure (Appendix B, Table 3). Terrestrial activity represented 99% of 6 different types, and aircraft (helicopters) 1%.

All 7 activity types elicited 75 significant responses from the breeding pair. The bald eagles were restless to 21 hikers, 3 OHV's, 3 vehicles, and 2 horseback riders. The breeding pair flushed in response to 13 hikers, 11 OHV's, 5 agency workers, 4 horseback riders, 4 vehicles, 3 fisherman, and 1 helicopter. The birds left the area in response to 3 hikers, and 2 agency workers during banding and placement of satellite transmitters.

Food Habits. – Nestwatchers observed 29 forage attempts (Appendix B, Table 4). The male, female, and an unknown adult were successful in all of their forage attempts (12 of 12, 7 of 7, and 10 of 10 respectively). Ninety-three percent of the forage attempts were for fish, and 7% birds.

The breeding pair delivered 84 items to the nest (Appendix B, Table 5). The male delivered 45%, the female 24%, and an unknown adult 31%. The common prey types were fish (n=51), unknown prey (n=30), and birds (n=3). No items were identified to species.

Fort McDowell Breeding Area

Observation Period. – Observation dates ..... February 12 to April 28.
Total monitoring days/hours..... 56 days/ 473 hours.

Eagle Identification.
Male – Blue VID band "4/N" left leg, USFWS band right leg, adult plumage (1993 Blue Point nestling).
Female – Unbanded, adult plumage.

Management Activities.

- The Fort McDowell Yavapai Nation (FMYN) continued to restrict non-tribal member use of the river area.
- ABENWP contractors were introduced to the FMYN Police in an orientation session held on their first day in the field.
- The FMYN Police visited the ABENWP contractors on a regular basis.
- Fort McDowell erected No Trespassing signs on the road leading into the BA.
- ABENWP contractors help plant cottonwood trees during the Fort McDowell Riparian Workshop.
- Both nestlings were fitted with satellite transmitters at 9 weeks of age.

Human Activity. – Nestwatchers recorded 75 human activities (Appendix C, Table 6). Terrestrial activity accounted for 73% of 8 different types, and aircraft (small planes, and helicopters) 26%.

Five activities elicited 19 significant responses from the breeding pair. The bald eagles were restless to 3 fisherman, 3 agency workers, 2 small planes and 1 helicopter. The breeding pair flushed in response to 3 fisherman, 2 vehicles, 2 helicopters, and 2 agency workers during banding and placement of satellite transmitters.

Food Habits. – Nestwatchers observed 49 forage attempts (Appendix C, Table 7). The male was successful in 59% (13 of 22), and the female in 78% (21 of 27). Ninety percent of the attempts were for fish, 6% birds, and 2% mammals and unknown items each.

The breeding pair delivered 77 prey items to the nest (Appendix C, Table 8). The male delivered 49%, and the female 51%. Eighty-seven percent of those items were fish, 12% mammals, and 1% birds. No items were identified to species.

Ladders Breeding Area

Observation Period. – Observation dates ..... March 25 to June 16.
Total monitoring days/hours..... 50 days/565 hours.

ABENWP contractors were assigned to the Ladders BA after the failure of the Bartlett BA. Therefore, observation dates and times vary.

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

Management Activities.
- The USFS reinstated the seasonal BA closure.
- The USFS supplied contractors with a camping trailer.
- The USFS closed the public lands surrounding the Ladders BA on May 29 due to fire danger.

Human Activity. – Nestwatchers recorded 49 human activities during 50 days of observation (Appendix D, Table 9). Aircraft (small planes, and helicopters) accounted for 47%, watercraft (boats) 33%, and terrestrial activity 20% of 4 different types.

Two activities elicited 4 significant responses from the breeding pair. The bald eagles flushed in response to 2 agency workers, and 1 boat, and returned to nest in response to 1 boat. Extreme drought conditions curtailed boating activity in comparison to earlier years of monitoring.

Food Habits. – Nestwatchers observed 11 forage attempts (Appendix D, Table 10). The male was successful in 63% (5 of 8), and the female in 33% (1 of 3). Sixty-four percent of the attempts were for fish, 27% reptiles, and 9% mammals.

The breeding pair delivered 54 prey items to the nest (Appendix D, Table 11). The male delivered 65%, the female 33%, and an unknown adult 2%. Sixty-five percent of those items were fish, 18% mammals, 9% unknown , 6% reptiles, and 2% birds.

Of the 29 items that could be identified to species, 76% were common carp (*Cyprinus carpio*), 10% soft-shelled turtles (*Kinosternon sonoriense* or *Trionyx spiniferus*), 7% flathead catfish (*Pylodictis olivaris*), and 3% each muskrats (*Ondatra zibethica*) and rabbits (*Sylvilagus spp*.) (Appendix D, Table 12).

Luna Breeding Area

Observation Period. – Observation dates .....February 9 to June 9.
Total monitoring days/hours..... 81 days/ 836 hours.

Eagle Identification.
Male – Black VID band "?/A" right leg, USFWS band left leg, adult plumage (1988 Texas nestling).
Female – Black VID band "? /B" right leg, USFWS band left leg, adult plumage (Unknown origin).

Management Activities
- The USFS reinstated the seasonal breeding area closure around the nest.
- Nestwatchers were stationed at the boat ramp to talk to fisherman launching boats.
- The USFS housed the nestwatchers in a trailer.

Human Activity. – Nestwatchers recorded 1461 human activities (Appendix E, Table 13). Terrestrial activities represented 79% of 4 different types, watercraft (boats) 20%, and aircraft (jets) less than 1%.

Four activities elicited 6 significant responses from the breeding pair. The bald eagles were restless in response to 2 jets, 1 driver and 1 gunshot. The breeding pair left the area in response to 2 boats.

Mild weather during the winter allowed for earlier access to the lake for fisherman and boaters, thus the increase of that activity as compared to previous years monitoring.

Food Habits. – Nestwatchers observed 100 forage attempts (Appendix E, Table 14). The male was successful in 81% (48 of 59), the female in 70% (26 of 37), and an unknown adult in 25% (1 of 4). Fifty-nine percent of the attempts were for fish, 31% birds, and 10% unknown.

The breeding pair delivered 85 prey items to the nest (Appendix E, Table 15). The male delivered 61%, the female 35%, and an unknown adult 4%. Fifty-five percent of those items were fish, 24% mammals, 20% unknown, and 1% reptiles. No items were identified to species.

Lynx Breeding Area

Observation Period. – Observation dates.....February 8 to March 7.
Total monitoring days/hours..... 18 days/ 200 hours.

The breeding attempt at Lynx Lake failed on March 1, 2002. Upon ABENWP contractors arriving at the site the breeding adults had been incubating a minimum of 33 days. Although it is unknown why the eggs did not hatch, the cause of failure could be attributed to this pair's first attempt at breeding.

Eagle Identification.
Male – Blue VID band "9/??" left leg, USFWS band right leg, adult plumage.
Female – Unbanded, adult plumage.

Management Activities

- The USFS and AGFD instated the seasonal breeding area closure around the nest.
- Nestwatchers were stationed at the campground to talk to visitors.
- The USFS housed the nestwatchers at one of the developed campgrounds.

Human Activity. – Nestwatchers recorded 22 human activities in 18 days of observation (Appendix F, Table 16). Watercraft (boats, and kayaks) represented 68%, terrestrial activities 27% of 3 different types, and aircraft (helicopters) 5%.

Three activities elicited 5 significant responses from the breeding pair. The bald eagles flushed in response to 3 kayaks, 1 boat, and 1 photographer.

Food Habits. – Nestwatchers observed 30 forage attempts (Appendix F, Table 17). The male was successful in 60% (9 of 15), and the female in 87% (13 of 15). Ninety-three percent of the attempts were for fish, and 7% birds.

The breeding pair delivered 22 prey items to the nest (Appendix F, Table 18). The male delivered 41%, and the female 59%. Ninety-one percent of those items were fish, and 9% birds.

Of the 17 items that could be identified to species, 88% were rainbow trout (*Oncorhynchus mykiss*), and 6% each were American coots (*Fulica americana*) and ruddy ducks (*Oxyura jamaicensis*) (Appendix F, Table 19).

Needle Rock Breeding Area

Observation Period. – Observation dates .....March 9 to May 23.
Total monitoring days/hours..... 57 days/422 hours.

ABENWP contractors were assigned to the Needle Rock BA after the failure of the Lynx BA. Therefore, observation dates and times vary.

Eagle Identification.
Male – Blue VID band "??/??" left leg, USFWS band right leg, adult plumage.
Female – USFWS banded right leg, adult plumage.

Intervention. – On May 4, ABENWP contractors watched the Needle Rock nest and the 9 week old nestling fall from the tree. Efforts to rebuild the nest and replace the nestling the same day were thwarted by an active bee hive. On May 5, we placed the nestling in alternate nest #2, where the adults resumed rearing duties.

The 10 week old nestling fell a second time on May 13, and again bees prohibited replacing the nestling in the alternate nest. We built a temporary artificial third alternate nest in a large cottonwood tree within the BA, and placed the nestling on May 14.

The nestling fell a third time and was replaced into the artificial nest on May 16, where the nestling successfully fledged later that day.

On May 18, ABENWP contractors reported the juvenile was injured near Needle Rock Recreation Area. We recovered the juvenile and transferred it to Liberty Wildlife Rehabilitation later that day. On July 30, the rehabilitated juvenile was re-released back into its natal area.

Management Activities.
- The owners of Rio Verde Ranch allowed contractors to camp on their lawn.
- ABENWP contractors were active in educating the public visiting the Needle Rock Recreation Area.
- The nestling was fitted with a satellite transmitter after rehabilitation.

Human Activity. – Nestwatchers recorded 511 human activities (Appendix G, Table 20). Terrestrial activities represented 90% of 7 different types, aircraft (planes and helicopters) 9%, and watercraft (boats) 1%.

Nine activities elicited 45 significant responses from the breeding pair. The bald eagles were restless in response to 2 OHV's and 1 gunshot. The breeding adults flushed in response to 17 OHV's, 5 gunshots, 5 agency workers, 3 planes, 3 hikers, 2 fisherman, and 1 each driver, horseback rider, and helicopter. The bald eagles left the area in response to 3 gunshots, and 1 OHV.

Food Habits. – Nestwatchers observed 72 forage attempts (Appendix G, Table 21). The male was successful in 75% (24 of 72), and the female in 90% (36 of 40). Ninety-nine percent of the attempts were for fish, and 1% birds.

The breeding pair delivered 59 prey items to the nest (Appendix G, Table 22). The male delivered 39%, and the female 61%. Ninety-eight percent of those items were fish, and 2% birds. No items were identified to species.

Orme Breeding Area

Observation Period. – Observation dates.....February 9 to June 6.
Total monitoring days/hours.....85 days/900 hours.

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

The male bald eagle from the Orme BA is in a polygynous relationship with the female from the Rodeo BA. This adult was observed incubating at both nests, taking food from one nest to feed the nestlings at the other, and foraging for both nests equally.

Management Activities.
- The Salt River Pima-Maricopa Indian Community (SRPMIC) continues to restrict non-tribal member use of the river area/
- The SRPMIC Police visited the ABENWP contractors on nearly a daily basis.
- Both nestlings were fitted with satellite transmitters at 9 weeks of age.

Human Activity. – Nestwatchers recorded 202 human activities (Appendix H, Table 23). Aircraft (planes, and helicopters) represented 45%, terrestrial activity 43% of 14 different types, and watercraft (airboats, rafters, and canoe/kayaks) 11%.

Nine activities elicited 25 significant responses by the breeding pair. The bald eagles were restless to 1 helicopter and 1 plane. The breeding pair flushed in response to 6 helicopters, 4 hikers, 3 agency workers, 3 rafters, 3 swimmers, 2 photographers, and 1 each fisherman and bicyclist.

Food Habits. – Nestwatchers observed 24 forage attempts (Appendix H, Table 24). The male was successful in 57% (4 of 7), and the female 70% (12 of 17). The most common forage item was fish (96%), although birds (4%) were captured.

The breeding pair delivered 38 prey items to the nest (Appendix H, Table 25). The male delivered 42%, and the female 58%. Ninety-seven percent of those items were fish, and 3% birds.

Of the 20 prey items that could be identified to species, 80% were sucker spp., 15% channel catfish (*Ictalurus punctatus*), and 5% small-mouth bass (*Micropterus dolomieu*) (Appendix H, Table 26).

Pleasant Breeding Area

Observation Period. – Observation dates ..... February 11 to May 16.
Total monitoring days/hours..... 70 days/773 hours.

Eagle Identification.
Male – Blue VID band "W" left leg, USFWS band right leg, adult plumage (1987 Horse Mesa nestling).
Female – Unbanded, adult plumage.

Management Activities.

- Maricopa County Parks and Recreation Department (MCPRD) reinstated the seasonal closure around the active nest.
- MCPRD marked closure boundaries with buoys.
- Nestwatchers were stationed at the southern closure boundary to educate recreationists on the closure and bald eagles.

Human Activity. – Nestwatchers recorded 151 human activities (Appendix I, Table 27). Watercraft (boats and jet skis) represented 94%, aircraft (jets, helicopters, and ultra lights) 5%, and terrestrial activities (hikers) 1%.

One activity elicited one significant responses by the breeding pair. The bald eagles flushed in response to one jet.

Of the 4,148 watercraft that approached the southern buoy line, only 94 (2%) did not comply (agency boats omitted) (Appendix I, Table 28). Boats represented 75% of those non-complying, and 25% jet skis. However within the type of watercraft, only 2% of the boats and 4% of the jet skis did not comply with the closure. For the third consecutive year, noncompliance has been at its lowest since the closure was enacted on the new lake levels in 1994 (Beatty and others 1995a, 1995b, 1997, 1998, 1999, Driscoll and Koloszar 2001, 2002).

Food Habits. – Nestwatchers documented 55 prey deliveries, and observed no forage attempts. Of the 55 prey deliveries, the breeding adults delivered 40% fish and 60% unknown items. No prey items could be identified to species.

Sycamore Breeding Area

Observation Period. – Observation dates ..... February 9 to April 28.
Total monitoring days/hours..... 54 days/623 hours.

Eagle Identification.
Male – Blue VID band "3/G" left leg, USFWS band right leg, adult plumage (1992 Orme nestling).
Female – Unbanded, adult plumage.

Intervention. – One of the Sycamore nestling's was discovered with a broken tarsal bone during our banding trip on March 20. The nestling was taken to Liberty Wildlife Rehabilitation, where x-rays also revealed a broken pelvic bone. The nestling remains in rehabilitation.

Management Activities.
- The FMYN continues to restrict non-tribal member use of the river area.
- The FMYN Police visited the ABENWP contractors on nearly a daily basis.
- ABENWP contractors were introduced to the FMYN police in an orientation session held on their first day in the field.
- ABENWP contractors help plant cottonwood trees during the Fort McDowell Riparian Workshop.
- The remaining nestling was fitted with satellite transmitter at 9 weeks of age.

Human Activity. – Nestwatchers recorded 25 human activities (Appendix J, Table 29). Terrestrial activity accounted for 72% of 3 different types, and aircraft (small planes, and helicopters) 28%.

Four activities elicited 16 significant responses from the breeding pair. The bald eagles were restless to 3 drivers, and 3 agency workers. The breeding pair flushed in response to 6 drivers, 2 agency workers, and 1 helicopter. The breeding adults left the area in response to one driver.

Food Habits. – Nestwatchers observed 13 forage attempts (Appendix J, Table 30). The male was successful in 77% (7 of 9), and the female in 100% (4 of 4). Sixty-two percent of the attempts were for fish, 15% each mammals and unknown items, and 7% birds.

The breeding pair delivered 98 prey items to the nest (Appendix J, Table 31). The male delivered 49%, the female 48%, and an unknown adult 2%. Sixty-five percent of those items were fish, 19% unknown, 10% birds, 4% mammals, and 1% unknown items.

Of the 43 prey items that could be identified to species, 77% were sucker spp., 14% American coots, and 9% channel catfish (Appendix J, Table 32).

Tonto Breeding Area

Observation Period. – Observation dates ..... February 9 to May 12.
Total monitoring days/hours..... 93 days/745 hours.

Eagle Identification.
Male – Blue VID band "G" left leg, USFWS band right leg, adult plumage (1987 Pinal nestling).
Female – Blue VID band "Backwards 3" left leg, USFWS band right leg, adult plumage (1987 Horseshoe nestling).

Management Activities.
- The Indian Point campground remained closed throughout the breeding season.
- The Southwestern Willow Flycatcher Closure limited recreational activities in the area.

Human Activity. – Nestwatchers recorded 35 human activities (Appendix K, Table 33). Aircraft (small planes, and helicopters) represented 86%, and terrestrial activities (woodcutter, and gunshots) 14%. One small plane cause the adults to be restless on one occasion

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 106 prey items to the nest (Appendix K, Table 34). The male delivered 47%, and the female 52%. Forty-five percent of those items were unknown, 32% fish, 14% birds, and less than one percent mammals. No prey items were identified to species.

Tower Breeding Area

Observation Period. – Observation dates .....February 9 to May 26.
Total monitoring days/hours..... 703 hours.

Eagle Identification.
Male – Purple VID band "Diamond 8" left leg, USFWS band right leg, adult plumage (1988 Ladders nestling).
Female – Unbanded, adult plumage.

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

Human Activity. – Nestwatchers recorded 248 human activities (Appendix L, Table 35). terrestrial activities represented 57% of 11 different types, and aircraft (small planes, helicopters, jets, sonic booms) 43%.

Thirteen activities elicited 35 significant responses from the breeding pair. The bald eagles were restless to one each, train, dogs, gunshots, and sightseers. The breeding pair flushed in response to 3 trains, 2 cattle, 2 sonic booms, 1 hunter, and 1 vehicle. The adults left the area in response to one jet. Twenty-one various significant responses were additionally recorded for eight activities.

Food Habits. – Nestwatchers observed 21 forage attempts (Appendix L, Table 36). The male was successful in 57% (4 of 7), and the female in 71% (10 of 14). Eighty-one percent of the attempts were for fish, 14% mammals, and 5% unknown.

The breeding pair delivered 78 prey items to the nest (Appendix L, Table 37). The male delivered 51%, the female 45%, and an unknown adult 4%. Seventy-one percent of those items were fish, 22% mammals, 5% birds, 1% each mammals and carrion items.

Of the 34 prey items that could be identified to species, 38% were sucker spp., 18% small-mouth bass, 15% common carp, and 12% rabbits (Appendix L, Table 38). Other species identified were channel catfish, common merganser (*Mergus merganser*), bullfrogs (*Rana catesbeiana*), and black-tailed jackrabbits (*Lepus californicus*).

OTHER INTERVENTIONS

Granite Reef Breeding Area

One Granite Reef nestling fell from the nest near dusk on May 20 at 9.5 weeks of age. After receiving the call from ABENWP contractors, we recovered the nestling that night, and replaced it on May 21. The nestling successfully fledged between June 1 and 2.

Horseshoe Breeding Area

During a nest survey flight on May 21, both 9 week old Horseshoe nestlings were discovered on the ground below the nest. Arizona Public Service provided helicopter transport back to the BA where both nestlings were recovered and replaced into the nest.

Rodeo Breeding Area

On May 21, ABENWP contractors reported the 12 week old Rodeo nestling was on the ground and not able to fly. We recovered the nestling, and placed it back into the nest tree later that day. The nestling successfully fledged 3 days later.

Sheep Breeding Area

While banding at the Sheep BA on April 28, we discovered 1 of the nestlings emaciated and dehydrated. The nestling was transferred to Liberty Wildlife Rehabilitation for treatment, and returned to the nest on April 30. The nestling successfully fledged near the end of May.

MANAGEMENT RECOMMENDATIONS

Box Bar Breeding Area

1. Enlarge the current closure to include the campground at the end of USFS Road 160.
2. Due to the high levels of human activity, more law enforcement staff needs to be devoted to the area.
3. Restrict access to the area by gating all entry roads, including USFS Road 160.
4. More trashcans and outhouses are needed at the campground to keep recreationists from leaving potentially lethal litter in the breeding area and seeking privacy within the closure.

Fort McDowell Breeding Area

1. Increase the number and visibility of signs leading into the riparian area. Signs should clearly state the regulations for use and penalties afforded.
2. Continue riparian habitat restoration projects like the cottonwood pole planting.
3. Increase the enforcement of litter laws to keep recreationists from leaving potentially lethal litter in the breeding area.
4. Increase law enforcement officers knowledge of the environmental regulations and laws slated to protect the riparian areas through training or presentations.
5. Eliminate livestock grazing in the riparian areas of the reservation.

Ladders Breeding Area

1. Add an additional closure sign near the nest area to inform boaters where the portage restriction ends.

2. Place an information kiosk at the Beasley Flats launch to educate boaters about the closure and recreations affect on the bald eagles.
3. Add an additional closure sign at the USFS road access to Chasm Creek to inform recreationist about the closure.
4. Extend the closure date to June 30 to be consistent with other closures statewide.

Luna Breeding Area

1. Keep the campgrounds near the BA closed until the confirmed fledging or failure of the BA.
2. Add more signs within the entire recreation area to notify everyone of the closures existence.
3. Maintain the existing waterfowl closure, and strictly adhere to the closure date of April 1.
4. Increase law enforcement presence at the lake.
5. Ban idling trucks from parking at the boat ramp.
6. Increase the breeding pairs foraging opportunities by creating a waterfowl breeding island.

Lynx Lake Breeding Area

1. Extend the current buoy line to the cove directly south of the nest tree.
2. Increase closure signs on the shore around the nest tree.

Needle Rock Breeding Area

1. Create a closure on the east side of the river from the Needle Rock Campground south to the Box Bar Closure and include the campground at the end of USFS Road 160.
2. Hire an extra pair of ABENWP contractors to cover weekends and off weeks for the BA.
3. Increase radio communication by giving the ABENWP contractors USFS and AGFD radios.
4. Increase land and law enforcement coordination by holding meetings between USFS, and AGFD to discuss safety for the ABENWP contractors at this BA.
5. Increase law enforcement presence at the BA during the weekends.

Orme Breeding Area

1. Continue AGFD and Tribal Police coordination meetings, and include Water Treatment Plant Employees, and other officials in the area.
2. Continue to restrict access to the Salt River Pima-Maricopa Indian Community.
3. Increase tribal community awareness of the ABENWP contractors and the goals of the program.
4. Increase riparian habitat in the BA using cattle rotations, pole planting, and vegetation surveys.

Pleasant Breeding Area

1. Increase the visibility of the buoys by adding signs to the tops of every third buoy.
2. Establish a procedure where ABENWP contractors can turn in repeat offenders of the closure by using the hull number.
3. Maintain the closure through June 15.

Sycamore Breeding Area

1. Close the road passing beneath the current nest tree during the breeding season.

Tonto Breeding Area

1. Establish a no camping restriction at Bermuda Flats during the breeding season to increase the pairs foraging opportunities.
2. Close the Indian Point Campground and boat ramp during low water years.
3. Evaluate the Tonto Creek Riparian Unit restoration measures by surveying habitat regeneration and condition.

Tower Breeding Area

1. Increase educational outreach in the area by presenting at local organization meetings.
2. Install Raptor Protective Devices on the power poles within the BA.
3. Continue the working relationship with the Verde Canyon Railroad.
4. Replace all closure signs with the clear bilingual metal signs.
5. Increase the education of local pilots to avoid the BAs.
6. Close or sign early all roads that end at the closure.
7. Extend the downstream closure boundary to limit violators coming from upstream.

LITERATURE CITED

Beatty, G.L., J.T. Driscoll, and J.G. Koloszar. 1995a. Arizona bald eagle nestwatch program: 1995 summary report. Nongame and Endangered Wildlife Program Technical Report Number 85. Arizona Game and Fish Department, Phoenix, Arizona.

_____. 1997. Arizona bald eagle nestwatch program: 1996 summary report. Nongame and Endangered Wildlife Program Technical Report Number 117. Arizona Game and Fish Department, Phoenix, Arizona.

_____. 1998. Arizona bald eagle nestwatch program: 1997 summary report. Nongame and Endangered Wildlife Program Technical Report Number 131. Arizona Game and Fish Department, Phoenix, Arizona.

_____. 1999. Arizona bald eagle nestwatch program: 1998 summary report. Nongame and Endangered Wildlife Program Technical Report Number 139. Arizona Game and Fish Department, Phoenix, Arizona.

Beatty, G.L., J.T. Driscoll, and M.C. Siemens. 1995b. Arizona bald eagle nestwatch Program: 1994 Summary Report. Nongame and Endangered Wildlife Program Technical Report Number 72. Arizona Game and Fish Department, Phoenix, Arizona.

Brown D.E. (ed.). 1982. Biotic communities of the American Southwest - United States and Mexico. University of Arizona. Desert Plants 4:1-342.

Driscoll J.T. and G.L. Beatty. 1994. 1993 Arizona bald eagle nest survey. Nongame and Endangered Wildlife Program Technical Report 31. Arizona Game and Fish Department, Phoenix, Arizona.

_____, and J.D. Hanna. 1992. 1992 Arizona bald eagle nest survey final report and recommendations. Nongame and Endangered Wildlife Program Technical Report. Arizona Game and Fish Department, Phoenix, Arizona.

_____, and J.G. Koloszar. 1995b. Arizona bald eagle 1995 nest survey. Nongame and Endangered Wildlife Program Technical Report 87. Arizona Game and Fish Department, Phoenix, Arizona.

_____. 1997. Arizona bald eagle 1996 nest survey. Nongame and Endangered Wildlife Program Technical Report 117. Arizona Game and Fish Department, Phoenix, Arizona.

_____. 1998. Arizona bald eagle 1997 nest survey. Nongame and Endangered Wildlife Program Technical Report 127. Arizona Game and Fish Department, Phoenix, Arizona.

_____. 1999. Arizona bald eagle 1998 nest survey. Nongame and Endangered Wildlife Program Technical Report 138. Arizona Game and Fish Department, Phoenix, Arizona.

Driscoll J.T., G.L. Beatty, and M.C. Siemens. 1995a. Arizona bald eagle 1994 nest survey. Nongame and Endangered Wildlife Program Technical Report 71. Arizona Game and Fish Department, Phoenix, Arizona.

Driscoll J.T. and J.G. Koloszar. 2001. Arizona bald eagle nestwatch program: 1999 - 2000 summary report. Nongame and Endangered Wildlife Program Technical Report 181. Arizona Game and Fish Department, Phoenix, Arizona.

_____. 2002. Arizona bald eagle nestwatch program: 2001 summary report. Nongame and Endangered Wildlife Program Technical Report 188. Arizona Game and Fish Department, Phoenix, Arizona.

Hunt, W.G., D.E. Driscoll, E.W. Bianchi, and R.E. Jackman. 1992. Ecology of Bald Eagles in Arizona. BioSystems Analysis, Inc. Santa Cruz, California Volumes A, C. Report to U.S. Bureau of Reclamation, Contract 6-CS-30-04470.

Koloszar J.G. and J.T. Driscoll. 2001a. Arizona bald eagle 1999 - 2000 nest survey. Nongame and Endangered Wildlife Program Technical Report 182. Arizona Game and Fish Department, Phoenix, Arizona.

_____. 2001b. Arizona bald eagle 2001 nest survey. Nongame and Endangered Wildlife Program Technical Report 189. Arizona Game and Fish Department, Phoenix, Arizona.

Koloszar J.G., K.V. Jacobson, J.S. Canaca and J.T. Driscoll,. 2002. Arizona bald eagle 2002 nest survey. Nongame and Endangered Wildlife Program Technical Report 206. Arizona Game and Fish Department, Phoenix, Arizona.

Postupalsky, S. 1974. Raptor reproductive success: some problems with methods, criteria, and terminology. *In* F.N. Hammerstrom, B.E. Harrell and R.R. Olendorff, Eds. Management of

raptors. Proceedings of the conference on raptor conservation techniques. Raptor Research Report 2:21-31.

U.S. Fish and Wildlife Service. 1982. Bald eagle recovery plan (southwestern population). U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

_____. 1995. Endangered and threatened species: bald eagle reclassification; final rule. Federal Register. 60(133): 36000-10. Department of the Interior, Washington, D.C.

_____. 1999. Endangered and threatened wildlife and plants; proposed rule to remove the bald eagle in the lower 48 states from the list of endangered and threatened wildlife; proposed rule. Federal Register. 64(128):36454-64. Department of the Interior, Washington, D.C.

APPENDIX A: 2002 BALD EAGLE REPRODUCTION SUMMARY

Table 1. Arizona bald eagle breeding area productivity summary, 2002.

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Alamo	S	4	<2/1	1+	2/1-3/11	1	1	4/23-5/9
Bartlett*	F	2	1/7-2/1	1+	3/9	1	Failed 3/22.	
	Nestling died in nest at 1 week old.							
Becker	O							
Blue Point	S	10	1/8-2/5	2+	2/5-22	2	2	5/10-21
Box Bar*	S	3	<1/7	2+	2/9-11	2	1	4/26
	One nestling taken to rehab on 3/22. Cross-beak and non-releasable.							
Camp Verde	U							
Canyon	U							
Cedar Basin	O							
Cibecue	F	2	2/5-3/12	1+	Failed 3/12-4/16.			
Cliff	O							
Coldwater	S	3	2/1-3/11	2+	3/11-4/23	2	2	5/21-6/6
Coolidge	F	2	2/5-3/12	2+	3/12-4/16	2	Failed 6/6-20	
	Two nestlings died in nest at 8-10 weeks old.							
Devil's Post	U							
Doka*	S	2	12/7-1/7	2+	1/7-2/1	2	2	4/13, 4/27
Dupont	U							
East Verde	F	6	2/1-26	2	Failed 3/11-4/23.			
Fort McDowell*	S	16	12/7-1/7	2+	1/7-2/12	2	2	4/26
Granite Basin	O							
Granite Reef*	S	2	2/8-10	2+	3/18-21	2	2	6/2
Horse Mesa	S	4	1/8-2/5	1+	2/5-3/12	1	1	5/21-6/6
Horseshoe	S	11	1/7-2/1	2+	3/11-4/14	2	2	5/21-6/6
	One nestling last observed at 8.5 weeks of age.							
Ive's Wash	O							
Ladders*	S	3	2/1-2/21	2+	3/11-3/16	2	2	6/8, 6/15
Lone Pine	F	2	1/8-2/5	1+	Failed 2/5-3/12.			
Luna*	S	1	<1/10	2+	3/8-9	2	2	6/2, 6/8
Lynx*	F	1	<1/7	1+	Failed 3/1.			
Mule Hoof	U							
Needle Rock*	S	2	<3/1	2+	<3/1	1	1	5/16
	Nestling and nest fell out on 5/4 and 5/11. Returned to alternate nests on 5/5 and 5/14. Shot and taken to rehab on 5/18.							
Oak Creek	S	1	<4/23	2+	<4/23	2	2	5/3-6/6
Orme*	S	6	1/7-2/1	2+	2/26	2	2	5/26-31
Perkinsville	F	4	2/1-25	1	Failed 3/18-4/23.			
Pinal	S	6	<3/12	1	<3/12	1	1	>6/6
Pinto	F	4	1/8-2/5	1+	Failed 2/5-3/4.			
Pleasant*	S	2	1/7-2/10	1+	2/18-22	1	1	5/15
Redmond	F	5	1/8-2/5	2	Failed 3/12-29.			
Rock Creek	S	2	2/5-3/12	1+	3/12-5/20	1	1	>6/6

[1] Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.
[2] Nest numbers are from Hunt and others 1992; Driscoll and others 1992; Driscoll and Beatty 1994; Driscoll and others 1995a, 1995b, 1997, 1998, 1999, 2001; Koloszar and Driscoll 2001a, 2001b; Koloszar and others 2002.
* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 1 (continued).

Breeding Area	Status[1]	Nest[2]	Incubation Date	Eggs	Hatch Date	Young	Fledged	Fledge Date
Rodeo*	S	2	1/7-2/1	2	3/2	1	1	5/24
San Carlos	F	3	2/5-3/12	1+	3/12-4/16	1	Failed 5/22-6/6.	
	Nestling died in nest at 6-8 weeks old							
76	O							
Sheep	S	3	1/8-2/5	2+	2/5-3/6	2	2	5/21-6/6
Suicide	F	2	<3/12	3+	<3/12	3	Failed 4/16-5/10.	
	All three nestlings died in nest at 11 weeks old.							
Sycamore*	S	4	12/18-1/7	2+	2/1-8	2	1	4/27
	One nestling taken to rehab on 3/20 with broken tarsus and broken pelvic bone.							
Table Mountain	O							
Talkalai	S	6	1/8-2/5	2+	2/5-3/12	2	2	5/10-6/6
Tonto*	S	2	1/8-2/5	2+	2/18-22	2	2	5/15-21
Tower*	S	8	1/7-24	2+	2/28	2	2	5/27-31
Winkelman	U							

[1] Breeding area status codes (Postupalsky 1974): U=unoccupied, O=occupied, S=successful, F=failed.
[2] Nest numbers are from Hunt and others 1992; Driscoll and others 1992; Driscoll and Beatty 1994; Driscoll and others 1995a, 1995b, 1997, 1998, 1999, 2001; Koloszar and Driscoll 2001a, 2001b; Koloszar and others 2002.
* Nests monitored by the Arizona Bald Eagle Nestwatch Program.

Table 2. Arizona bald eagle productivity summary, 2002.

Number of BAs	47	Number of Active BAs	34
Number of Occupied BAs	41	Number of Failed Breeding Attempts	11
Number of Eggs	57+	Number of Successful Breeding Attempts	23
Nest Success = 23/41	0.56	Number of Young Hatched	46
Mean Brood Size = 37/24	1.54	Number of Young Fledged	37
		Productivity = 0.56 x 1.54	0.86

APPENDIX B: BOX BAR BREEDING AREA SUMMARY

Table 3. Observed human activity and bald eagle behavior, Box Bar BA, Arizona, 2002.

Human Activity	N[1]	W	R	F	L	U	Total
Hiker	54	123	21	13	3	190	404 (78.4%)
OHV	5	16	3	11	--	--	35 (6.8%)
Fisherman	11	13	--	3	--	--	27 (5.2%)
Horseback Rider	10	8	2	4	--	--	24 (4.6%)
Vehicle	2	6	3	4	--	--	15 (2.9%)
Agency Worker	--	--	--	5	2	--	7 (1.4%)
Helicopter	--	2	--	1	--	--	3 (0.5%)
Total	82	168	29	41	5	190	515

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

Table 4. Observed forage event and success, Box Bar BA, Arizona, 2002.

Sex	Fish		Birds		Total	
	E[1]	S[2]-U	E	S-U	E	S-U
Male	11	11-0	1	1-0	12	12-0
Female	6	6-0	1	1-0	7	7-0
Unknown	10	10-0	--	--	10	10-0
Total	27	27-0	2	2-0	29	29-0

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

Table 5. Observed prey types delivered to the nest, Box Bar BA, Arizona, 2002.

Sex	Fish	Birds	Unknown	Total
Male	24	2	12	38 (45.2%)
Female	13	--	7	20 (23.8%)
Unknown	14	1	11	26 (31.0%)
Total	51 (60.7%)	3 (3.6%)	30 (35.7%)	84

APPENDIX C: FORT MCDOWELL BREEDING AREA SUMMARY

Table 6. Observed human activity and bald eagle behavior, Fort McDowell BA, Arizona, 2002.

Human Activity	N[1]	W	R	F	U	Total
Vehicle	6	--	--	2	17	25 (33.3%)
Fisherman	--	--	3	3	9	15 (20.0%)
Helicopter	--	9	1	2	--	12 (16.0%)
Small Plane	--	5	2	1	--	8 (10.7%)
Agency Worker	--	--	3	2	--	5 (6.7%)
Woodcutter	--	3	--	--	--	3 (4.0%)
OHV	2	--	--	--	--	2 (2.7%)
Shooter	--	2	--	--	--	2 (2.7%)
Photographer	2	--	--	--	--	2(2.7%)
Dumping	1	--	--	--	--	1 (1.3%)
Total	11	19	9	10	26	75

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

Table 7. Observed forage event and success, Fort McDowell BA, Arizona, 2002.

Sex	Fish		Birds		Mammals		Unknown		Total	
	E[1]	S[2]-U	E	S-U	E	S-U	E	S-U	E	S-U
Male	18	12-6	3	0-3	1	1-0	--	--	22	13-9
Female	26	20-6	--	--	--	--	1	1-0	27	21-6
Total	44	32-12	3	0-3	1	1-0	1	1-0	49	34-15

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

Table 8. Observed prey types delivered to the nest, Fort McDowell BA, Arizona, 2002.

Sex	Fish	Birds	Mammals	Total
Male	31	1	6	38 (49.4%)
Female	36	--	3	39 (50.6%)
Total	67 (87.0%)	1 (1.3%)	9 (11.7%)	77

APPENDIX D: LADDERS BREEDING AREA SUMMARY

Table 9. Observed human activity and bald eagle behavior, Ladders BA, Arizona, 2002.

Human Activity	N[1]	W	F	X	B	Total
Small Boat	--	12	1	1	2	16 (32.7%)
Small Plane	7	2	--	--	4	13 (26.5%)
Helicopter	2	3	--	--	5	10 (20.4%)
Agency Worker	1	2	2	--	--	5 (10.2%)
Hiker	3	--	--	--	--	3 (6.1%)
Camper	--	1	--	--	--	1 (2.0%)
Horseback Riders	1	--	--	--	--	1 (2.0%)
Total	14	20	3	1	11	49

[1] Bald eagle behavior, N=none, W=watched, F=flushed, X=other (returns to nest), B=not in area.

Table 10. Observed forage event and success, Ladders BA, Arizona, 2002.

Sex	Fish		Mammals		Reptiles		Total	
	E[1]	S[2]-U	E	S-U	E	S-U	E	S-U
Male	6	4-2	1	1-0	1	0-1	8	5-3
Female	1	0-1	--	--	2	1-1	3	1-2
Total	7	4-3	1	1-0	3	1-2	11	6-5

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

Table 11. Observed prey types delivered to the nest, Ladders BA, Arizona, 2002.

Sex	Fish	Birds	Mammals	Reptiles	Unknown	Total
Male	21	1	8	1	4	35 (64.8%)
Female	14	--	2	2	--	18 (33.3%)
Unknown	--	--	0	--	1	1 (1.9%)
Total	35 (64.8%)	1 (1.9%)	10 (18.5%)	3 (5.6%)	5 (9.3%)	54

Table 12. Observed prey items delivered to the nest, Ladders BA, Arizona, 2002.

Sex	Fish		Mammals		Reptiles	Total
	Common Carp	Flathead Catfish	Rabbit	Muskrat	Soft-shelled Turtle	
Male	16	2	--	1	1	20 (69.0%)
Female	6	--	1	--	2	9 (31.0%)
Total	22	2	1	1	3	29

APPENDIX E: LUNA BREEDING AREA SUMMARY

Table 13. Observed human activity and bald eagle behavior, Luna BA, Arizona, 2002.

Human Activity	N[1]	W	R	L	Total
Fisherman	1155	--	--	--	1155 (79.1%)
Boater	277	16	--	2	295 (20.2%)
Jets	2	2	2	--	6 (0.4%)
Agency Worker	--	3	--	--	3 (0.2%)
Driver	--	--	1	--	1 (0.1%)
Gunshot	--	--	1	--	1 (0.1%)
Total	1434	21	4	2	1461

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

Table 14. Observed forage event and success, Luna BA, Arizona, 2002.

Sex	Fish	Birds	Unknown	Total	
	E[1]	E	E	E	S-U[2]
Male	30	22	7	59	48-11
Female	27	8	2	37	26-11
Unknown	2	1	1	4	1-3
Total	59	31	10	100	75-25

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

Table 15. Observed prey types delivered to the nest, Luna BA, Arizona, 2002.

Sex	Fish	Birds	Reptiles	Unknown	Total
Male	34	12	--	6	52 (61.2%)
Female	13	8	1	8	30 (35.3%)
Unknown	--	--	--	3	3 (3.5%)
Total	47 (55.3%)	20 (23.5%)	1 (1.2%)	17 (20.0%)	85

APPENDIX F: LYNX BREEDING AREA SUMMARY

Table 16. Observed human activity and bald eagle behavior, Lynx BA, Arizona, 2002.

Human Activity	N[1]	W	F	Total
Kayak	1	4	3	8 (36.4%)
Boater	--	6	1	7 (31.8%)
Hiker	3	--	--	3 (13.6%)
Fisherman	--	2	--	2 (9.1%)
Photographer	--	--	1	1 (4.5%)
Helicopter	1	--	--	1 (4.5%)
Total	5	12	5	22

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

Table 17. Observed forage event and success, Lynx BA, Arizona, 2002.

Sex	Fish		Birds		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	14	8-6	1	1-0	15	9-6
Female	14	12-2	1	1-0	15	13-2
Total	28	20-8	2	2-0	30	22-8

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

Table 18. Observed prey types delivered to the nest, Lynx BA, Arizona, 2002.

Sex	Fish	Birds	Total
Male	8	1	9 (40.9%)
Female	12	1	13 (59.1%)
Total	20 (91.0%)	2 (9.1%)	22

Table 19. Observed prey items delivered to the nest, Lynx BA, Arizona, 2002.

Sex	Fish	Birds		Total
	Rainbow Trout	American Coot	Ruddy Duck	
Male	6	1	--	7 (41.2%)
Female	9	--	1	10 (58.8%)
Total	15	1	1	17

APPENDIX G: NEEDLE ROCK BREEDING AREA SUMMARY

Table 20. Observed human activity and bald eagle behavior, Needle Rock BA, Arizona, 2002.

Human Activity	N[1]	W	R	F	L	Total
Gunshots	239	--	1	5	3	248 (48.5%)
Fisherman	80	--	--	2	--	82 (16.0%)
OHV	32	4	2	17	1	56 (11.0%)
Drivers	34	--	--	1	--	35 (6.8%)
Plane	26	1	--	3	--	30 (5.9%)
Hiker	14	--	--	3	--	17 (3.3%)
Helicopter	11	5	--	1	--	17 (3.3%)
Horseback Rider	15	--	--	1	--	16 (3.1%)
Agency Worker	1	--	--	5	--	6 (1.2%)
Kayak	4	--	--	--	--	4 (0.8%)
Total	456	10	3	38	4	511

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

Table 21. Observed forage event and success, Needle Rock BA, Arizona, 2002.

Sex	Fish		Birds		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	31	23-8	1	1-0	32	24-8
Female	40	36-4	--	--	40	36-4
Total	71	59-12	1	1-0	72	60-12

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

Table 22. Observed prey types delivered to the nest, Needle Rock BA, Arizona, 2002.

Sex	Fish	Birds	Total
Male	22	1	23 (39.0%)
Female	36	--	36 (61.0%)
Total	58 (98.3%)	1 (1.7%)	59

APPENDIX H: ORME BREEDING AREA SUMMARY

Table 23. Observed human activity and bald eagle behavior, Orme BA, Arizona, 2002.

Human Activity	N[1]	W	R	F	B	Total
Helicopter	29	25	1	6	9	70 (34.7%)
Agency Worker	10	13	--	3	4	30 (14.9%)
Plane	4	15	1	--	1	21 (10.4%)
Drivers	5	7	--	--	4	16 (7.9%)
Rafter	6	7	--	3	--	16 (7.9%)
Hiker	2	3	--	4	--	9 (4.5%)
Alarms	5	4	--	--	--	9 (4.5%)
Canoe/Kayak	5	1	--	--	--	6 (3.0%)
Fisherman	1	1	--	1	2	5 (2.5%)
Picnickers	1	--	--	--	3	4 (2.0%)
Swimmers	--	--	--	3	1	4 (2.0%)
Photographers	--	1	--	2	--	3 (1.5%)
Horseback Rider	--	2	--	--	1	3 (1.5%)
Campers	--	1	--	--	--	1 (0.5%)
Bicyclist	--	--	--	1	--	1 (0.5%)
Construction	1	--	--	--	--	1 (0.5%)
Gunshots	1	--	--	--	--	1 (0.5%)
Airboat	--	--	--	--	1	1 (0.5%)
Dogs	--	1	--	--	--	1 (0.5%)
Total	70	81	2	23	26	202

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

Table 24. Observed forage event and success, Orme BA, Arizona, 2002.

Sex	Fish		Birds		Total	
	E[1]	S-U[2]	E	S-U	E	S-U
Male	6	3-3	1	1-0	7	4-3
Female	17	12-5	--	--	17	12-5
Total	23	15-8	1	1-0	24	16-8

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

Table 25. Observed prey types delivered to the nest, Orme BA, Arizona, 2002.

Sex	Fish	Birds	Total
Male	15	1	16 (42.1%)
Female	22	--	22 (57.9%)
Total	37 (97.4%)	1 (2.6%)	38

Table 26. Observed prey items delivered to the nest, Orme BA, Arizona, 2002.

Sex	Fish			Total
	Suckers spp.	Channel Catfish	Smallmouth Bass	
Male	6	1	--	7 (35.0%)
Female	10	2	1	13 (65.0%)
Total	16	3	1	20

APPENDIX I: PLEASANT BREEDING AREA SUMMARY

Table 27. Observed human activity and bald eagle behavior, Pleasant BA, Arizona, 2001.

Human Activity	N[1]	W	F	Total
Boats	--	71	--	71 (47.0%)
Agency Boats	--	48	--	48 (31.8%)
Jet-Ski	--	23	--	23 (15.2%)
Jets	--	3	1	4 (2.6%)
Ultra light	2	--	--	2 (1.3%)
Hikers	2	--	--	2 (1.3%)
Helicopter	--	1	--	1 (0.7%)
Total	4	146	1	151

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

Table 28. Watercraft compliance at the southern closure boundary, Pleasant BA, Arizona, 2002.

Date	Boats at Closure	Boats in Closure	Agency Boats in Closure	Jet Skis at Closure	Jet Skies in Closure	Total
2/11-17	172	0	5	21	0	198
2/22-3/3	260	5	0	18	0	283
3/8-17	350	3	4	49	2	408
3/22-31	524	11	9	69	0	613
4/5-14	738	25	15	143	9	930
4/20-28	485	13	7	112	7	624
5/3-12	906	14	8	159	5	1092
Total	3435 (82.8%)	71 (1.7%)	48 (1.2%)	571 (13.8%)	23 (0.5%)	4148

APPENDIX J: SYCAMORE BREEDING AREA SUMMARY

Table 29. Observed human activity and bald eagle behavior, Sycamore BA, Arizona, 2002.

Human Activity	N[1]	R	F	L	X	U	Total
Drivers	--	3	6	1	--	--	10 (40.0%)
Agency Worker	--	3	2	--	1	1	7 (28.0%)
Plane	4	--	--	--	--	--	4 (16.0%)
Helicopter	2	--	1	--	--	--	3 (12.0%)
OHV	--	--	--	1	--	--	1 (4.0%)
Total	6	6	9	1	1	1	25

[1] Bald eagle behavior, N=none, R=restless, F=flushed, L=left area, X=no explanation offered, U=inknown.

Table 30. Observed forage event and success, Sycamore BA, Arizona, 2002.

Sex	Fish		Birds		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U	E	S-U
Male	5	5-0	1	1-0	1	1-0	2	0-2	9	7-2
Female	3	3-0	--	--	1	1-0	--	--	4	4-0
Total	8	8-0	1	1-0	2	2-0	2	0-2	13	11-2

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

Table 31. Observed prey types delivered to the nest, Sycamore BA, Arizona, 2002.

Sex	Fish	Birds	Mammals	Reptiles	Unknown	Total
Male	28	7	2	1	10	48 (49.0%)
Female	36	3	2	--	7	48 (49.0%)
Unknown	--	--	--	--	2	2 (2.0%)
Total	64 (65.3%)	10 (10.2%)	4 (4.1%)	1 (1.0%)	19 (19.4%)	98

Table 32. Observed prey items delivered to the nest, Sycamore BA, Arizona, 2002.

Sex	Fish		Birds	Total
	Suckers spp.	Channel Catfish	American Coot	
Male	14	1	5	20 (46.5%)
Female	19	3	1	23 (53.5%)
Total	33	4	6	43

APPENDIX K: TONTO BREEDING AREA SUMMARY

Table 33. Observed human activity and bald eagle behavior, Tonto BA, Arizona, 2002.

Human Activity	N[1]	W	R	Total
Small Plane	14	5	1	20 (57.1%)
Helicopter	4	6	--	10 (28.6%)
Woodcutter	4	--	--	4 (11.4%)
Gunshot	1	--	--	1 (2.9%)
Total	23	11	1	35

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

Table 34. Observed prey types delivered to the nest, Tonto BA, Arizona, 2002.

Sex	Fish	Birds	Mammals	Unknown	Total
Male	19	9	1	22	51 (47.2%)
Female	23	6	--	26	55 (51.9%)
Total	34 (32.1%)	15 (14.2%)	1 (0.9%)	48 (45.3%)	106

APPENDIX L: TOWER BREEDING AREA SUMMARY

Table 35. Observed human activity and bald eagle behavior, Tower BA, Arizona, 2002.

Human Activity	N[1]	W	R	F	L	X	Total
Small Plane	3	75	--	--	--	2	80 (32.3%)
Trains	3	61	1	3	--	3	71 (28.6%)
Train Maint.	9	16	--	--	--	3	28 (11.3%)
Vehicle	12	1	--	1	--	7	21 (8.5%)
Helicopter	3	17	--	--	--	1	21 (8.5%)
Cattle	--	2	--	2	--	2	6 (2.4%)
Hiker	--	4	--	--	--	--	4 (1.6%)
Jet	--	--	--	--	1	2	3 (1.2%)
Fisherman	1	2	--	--	--	--	3 (1.2%)
Agency Worker	2	--	--	--	--	1	3 (1.2%)
Dogs	1	--	1	--	--	--	2 (0.8%)
Sonic Booms	--	--	--	2	--	--	2 (0.8%)
Gunshot	1	--	1	--	--	--	2 (0.8%)
Sightseer	--	--	1	--	--	--	1 (0.4%)
Hunter	--	--	--	1	--	--	1 (0.4%)
Total	35	178	4	9	1	21	248

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

Table 36. Observed forage event and success, Tower BA, Arizona, 2002.

Sex	Fish		Mammals		Unknown		Total	
	E[1]	S-U[2]	E	S-U	E	S-U	E	S-U
Male	5	3-2	2	1-1	--	--	7	4-3
Female	12	8-4	1	1-0	1	1-0	14	10-4
Total	17	11-6	3	2-1	1	1-0	21	14-7

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

Table 37. Observed prey types delivered to the nest, Tower BA, Arizona, 2002.

Sex	Fish	Mammals	Birds	Amphibian	Carrion	Total
Male	24	12	3	1	--	40 (51.3%)
Female	29	5	--	--	1	35 (44.9%)
Unknown	2	--	1	--	--	3 (3.8%)
Total	55 (70.5%)	17 (21.8%)	4 (5.1%)	1 (1.3%)	1 (1.3%)	78

Table 38. Observed prey items delivered to the nest, Tower BA, Arizona, 2002.

Sex	Fish				Birds	Amphibians	Mammals		Total
	S[1]	CC	SB	C	CM	BF	R	JK	
Male	4	1	3	3	2	1	4	1	19 (55.9%)
Female	9	--	2	2	--	--	--	1	14 (41.2%)
Unknown	--	--	1	--	--	--	--	--	1 (2.9%)
Total	13	2	6	5	2	1	4	2	34

[1] S=sucker spp., CC=channel catfish, SB=smallmouth bass, C= common carp, CM=Common Merganser, BF=Bullfrog, R=rabbits, JK=black-tailed jackrabbit.