Sarah Quamme/RO/R2/FWS/DOI
07/24/2006 04:02 PM

To: Mary Richardson/R2/FWS/DOI@FWS, Susan Jacobsen/RO/R2/FWS/DOI@FWS, Maricela Constantino/ARL/R9/FWS/DOI@FWS, Douglas
cc:
bcc:
Subject: bald eagle finding

Hello All,

For your assorted reviewing and editing needs, there is a clean version of the finding below. This version incorporates all known Regional and SOL comments on the finding, including the discreteness discussion but excluding the significance discussion.

90_Day_FR_Notice 7-24-06 clean.doc

. . . . . .

Sarah Joan Quamme, Endangered Species Biologist
U.S. Fish & Wildlife Service - Ecological Services
P.O. Box 1306, Albuquerque, NM 87103
505/248-6419; (Fax) 505/248-6788

Billing Code 4310-55-P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Petition to List the Sonoran desert population of the Bald Eagle as a Distinct Population Segment, List the Population as Endangered, and Designate Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 90-day petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on a petition to reclassify the Sonoran desert population of the bald eagle (Haliaeetus leucocephalus) in Arizona as a distinct population segment, list the population segment as endangered, and designate critical habitat for the population segment under the Endangered Species Act of 1973, as amended (Act). On the basis of a review of the information contained within the petition, we find that the petition does not provide substantial scientific or commercial information indicating that the petitioned

action may be warranted. Therefore, we will not be initiating a further status review in response to this petition. We ask the public to submit to us any new information that becomes available concerning the status of this population of the bald eagle or threats to it.

DATES: The finding announced in this document was made on [INSERT DATE THAT NOTICED IS PUBLISHED IN THE FEDERAL REGISTER].

ADDRESSES: The complete file for this finding is available for inspection, by appointment, during normal business hours at the Arizona Ecological Services Office, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ 85021-4951. Please submit any new information, materials, comments, or questions concerning this species or this finding to the above address.

FOR FURTHER INFORMATION CONTACT: Steve Spangle (see address above), telephone, 602-242-0210; facsimile, 602-242-2513.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act), requires that we make a finding on whether a petition to

list, delist, or reclassify a species presents substantial scientific or commercial information to indicate that the petitioned action may be warranted. We are to base this finding on information provided in the petition. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition, and publish our notice of this finding promptly in the Federal Register.

Our standard for substantial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)). If we find that substantial information was presented, we are required to promptly commence a review of the status of the species, if one has not already been initiated under our internal candidate assessment process.

In making this finding, we relied on information provided by the petitioners and evaluated that information in accordance with 50 CFR 424.14(b). Our process of coming to a 90-day finding under section 4(b)(3)(A) of the Act and section 424.14(b) of our regulations is limited to a determination of whether the information in the petition meets the "substantial information" threshold.

On October 6, 2004, we received a formal petition, dated October 6, 2004, from the Center for Biological Diversity (Center), the Maricopa Audubon Society, and the Arizona Audubon Council requesting that the bald eagle population found in the Sonoran Desert riparian areas of central Arizona and northwestern Mexico be classified as a

distinct population segment (DPS) and reclassified as an endangered species, in accordance with the Act. The petition also requested that critical habitat be designated concurrently for the DPS.

On February 11, 2005, the Service requested clarification on the boundaries of the Sonoran population, as defined by the petitioners. The petitioners responded with that clarification on March 5, 2005, requesting that we consider in the DPS analysis those bald eagles nesting along riparian areas in the Sonoran desert. At that time, further action on this petition was precluded by higher listing priorities. On January 19, 2006, we received from the Center a 60-day Notice of Intent (NOI) to sue the Service for failure to respond to the petition within the statutory timeframe. On March 27, 2006, the Center and the Maricopa Audubon Society filed a lawsuit against the U.S. Department of the Interior (DOI) and the Service for failure to make a finding on the petition within 90 days.

Species Information

The bald eagle (Haliaeetus leucocephalus) is the only species of sea eagle native to North America. Literally translated, H. leucocephalus means white-headed sea eagle (USFWS 1995, p. 36000). Bald eagles are birds of prey of the Order Falconiformes and Family Accipitridae. Bald eagles vary in length from 28 to 38 inches (71 to 97 centimeters), weigh between 6.5 to 14 pounds (2.9 6.4 kilograms), and have a 66 to 96 inch (1.8-2.6 meter) wingspan (Arizona Game and Fish Department (AGFD) 1999, p. 3).

Distinguishing features include a yellow hooked bill and yellow unfeathered legs and feet. Adults of the species have a dark brownish-black body color, black talons, with a white head, neck, and tail. Immature bald eagles are mostly dark brown and lack a white head and tail until they reach approximately five years of age (AGFD 2006a, pg. 1).

Gerrard and Bartolotti (1988, p. 2) note that bald eagles are believed to have nested on both coasts, along all major rivers and large lakes in the interior from Florida to Baja California in the south, and north to Labrador and Alaska. The species is known to have bred in every state and province in the United States and Canada except Hawaii (Hunt et al. 1992, p. A-9).

Hunt et al. (1992, p. A-11 to A-12) summarized the earliest records from the literature for bald eagles in Arizona. Coues noted bald eagles in the vicinity of Fort Whipple in 1866 (now Prescott), and Henshaw reported bald eagles south of Fort Apache in 1875. The first bald eagle breeding information was recorded in 1890 near Stoneman Lake by S.A. Mearns. Additionally, Bent reported breeding eagles at Fort Whipple in 1866 and on the Salt River Bird Reservation (since inundated by Roosevelt Lake) in 1911. Additionally, there are reports of bald eagles along rivers in the White Mountains from 1937, and reports of nesting bald eagles along the Salt and Verde Rivers as early as 1930.

The bald eagle population of the southwest recovery region, as identified in the final recovery plan for the species, reaches throughout Oklahoma and Texas west of the

100th meridian, all of New Mexico and Arizona, and the area of California bordering the Lower Colorado River (USFWS 1982, p. 1). The vast majority of these breeding bald eagles are found within the state of Arizona. The occurrence of breeding bald eagles in the state of New Mexico is very limited (USFS 2004, p. 153). In 2001, the New Mexico Department of Game and Fish (NMDGF) reported the occurrence of four bald eagle nest sites in New Mexico, all on private lands.

Nationwide, bald eagles are known to nest primarily along seacoasts and lakeshores, as well as along banks of rivers and streams (Stalmaster 1987, p. 120). In the Southwest, bald eagle breeding areas (BA) are located in close proximity to a variety of aquatic sites, including reservoirs, regulated river systems, and free-flowing rivers and creeks. The term "BA" is used to define eagle nesting sites and the area where they forage. In the southwest, nests are placed mostly on cliff edges, rock pinnacles, and in cottonwood trees. However, artificial structures, junipers, pinyon pines, sycamores, willows, ponderosa pines, and snags of these trees also have supported eagle nests (AGFD 2006c, p. 4).

In Arizona, the majority of nests are located in the Upper and Lower Sonoran Life Zones, (zones of plant and animal life associated with a given elevation) including the riparian habitats and transition areas of both zones (Hunt et al. 1992, p. A-17). Representative vegetation of these life zones includes Arizona sycamore (Platanus wrightii), blue paloverde (Parkinsonia florida), cholla (Opuntia spp.), Fremont cottonwood (Populus fremontii), Gooding willow (Salix gooddingii), mesquite (Prosopis

spp.), saguaro (Carnegiea gigantea), and tamarisk or salt cedar (Tamarix pentandra; an exotic species) (Brown 1994, p. 200).

Historical evidence to document bald eagles nesting in New Mexico is lacking, although unverified reports suggest one or two pairs may have nested in southwestern New Mexico prior to 1928. In the mid-1980s, a pair established a territory in Colfax County in an area where bald eagles concentrated in winter, and in 1987 an active nest was discovered nearby which produced two fledglings that year. In 1988, an active nest was discovered in Sierra County, also in an area of wintering eagle concentration; the nest fledged one young that year. Through 1999, those two nests together fledged a minimum of 31 young, with Colfax County being one of the more productive nests in North America. Additional nesting activity was recorded elsewhere after the mid-1980s, always in areas of wintering concentrations, including in San Juan, Rio Arriba, Quay, and Sierra counties. However, in each instance eagles built nests only to abandon the effort prior to egg laying; such "practice" nests are not uncommon among inexperienced adults. In 1998, two additional nests were discovered in Colfax County, and each fledged young in both 1998 and 1999 (five young total) (Williams 2000, abstract).

Bald eagles are long-lived bird species. Southwestern bald eagles are known to exceed 12 years of age (USFWS 1999, p. 36454; Hunt et al. 1992, p. A-v). Bald eagles primarily eat fish, but they will also eat amphibians, reptiles, birds, small mammals, carrion (dead animals), and carcasses of large mammals (cows, elk, deer, etc.). Their food habits can change daily or seasonally, but when a choice is available, bald eagles

invariably select fish over other prey. Bald eagles will scavenge, steal, or actively hunt to acquire food. Carrion constitutes a higher proportion of the diet for juveniles and subadults than it does for adult eagles. Bald eagles are primarily sit-and-wait hunters, perching in trees in order to detect available prey (Stalmaster 1987, p. 104).

Eagles in the southwest frequently construct nests on cliffs. By 1992, of the 111 nest sites known, 46 were in trees, 36 on cliffs, 17 on pinnacles, 11 in snags, and one on an artificial platform (Hunt et al. 1992, p. A-17). However, for breeding areas where both cliff and tree nests were available, one study found that cliff nests were selected 73 percent of the time, while tree nests were selected 27 percent of the time (Hunt et al. 1992, p. A-17). Additionally, eagles nesting on cliffs were found to be slightly more successful in raising young to fledgling, though the difference was not statistically significant. Nests may be used year after year. Hunt et al. (1992, p. A-20) determined the mean diameter of nests was five feet (156 centimeters).

Food strongly influences bald eagle productivity (Newton 1979, pp. 95-96, 101 – 106; Hansen 1987, p. 1389). A female's health in the months preceding egg laying can affect egg production, and the prey availability during the breeding cycle affects the survivorship of nestlings and post-fledging juveniles. Thus, any factor affecting the adults' ability to acquire food can influence productivity and adult survivorship (Newton 1979). The most common fish eaten in the southwest are Sonora and desert suckers; channel and flathead catfish; common carp; largemouth, smallmouth, yellow, and white bass; and black crappie. Less common are roundtail chub, green sunfish, bluegill, tilapia,

and rainbow trout (USFWS 1982, p. 11, AGFD 1999, p. 6). Prey availability has decreased on the upper Salt River in Arizona. The introduction of predatory flathead catfish in the late 1970s nearly extirpated native fish populations. Flathead catfish, while available as bald eagle prey when smaller, grow to large sizes (up to 50 pounds, or 22.6 kilograms) making them too large for a prey item. Flathead catfish populations have increased while other fish species have decreased(AGFD 2006, p. 19). Productivity for the four bald eagle BAs on the upper Salt River decreased from 1.12 young per year per occupied BA in the 1980s to 0.29 young per occupied BA in the 1990s.

Bald eagles in the southwest establish their breeding territories in December or January and lay eggs in January or February, which is early compared with bald eagles in more northerly areas (Stalmaster 1987, p. 63). Hunt et al. (1992, p. C-16) indicate that this may be a behavioral adaptation so chicks can avoid the extreme desert heat of midsummer and adults can take advantage of food resources for the rearing of eaglets. Young fledgling eagles can remain in their nest area though June learning how to fly and land, while still being primarily fed by adult eagles (Hunt et al. 1992, p. C-6 – C-7).

About 45 days after leaving the nest, young southwestern bald eagles migrate to Canada, Northern California, Idaho, Montana, North and South Dakota, Oregon, Washington, and Wyoming (Hunt et al. 1992, p. A-104 – A-114), returning to Arizona in the Fall of the same year. They are known to repeat this behavior for a minimum of 2 years (Hunt et al. 1992a-112; p. A-122 – A-123). Resident adult bald eagles often stay in their BAs year-round, although local short-term migrations are common (AGFD 1999, p.

6).

The first major decline in bald eagle populations began in the mid- to late-1800s when widespread shooting for feathers and trophies led to extirpation of eagles in some areas. Carrion treated with strychnine, thallium sulfate, and other poisons were used as bait to kill livestock predators and ultimately killed many eagles as well. These and other factors contributed to a reduction in bald eagle numbers through the 1940s (USFWS 1999, p. 36455). In the late 1940s, the use of dichloro-diphenyl-trichloroethane (DDT) and other organochlorine compounds became widespread. While DDT was initially sprayed along coastal and other wetland areas for mosquito control, it later was used as a general crop insecticide. DDT accumulated in individual bald eagles that had ingested contaminated prey, and reproductive success plummeted (USFWS 1999, p. 36455). In the late 1960s and early 1970s, it was determined that dichlorophenyl-dichloroethylene (DDE), a breakdown product of DDT, accumulated in fatty tissues of adult female eagles and impaired the calcium release needed for normal egg shell formation.

On March 11, 1967 (32 FR 4001), the Secretary of the Interior listed bald eagles south of the 40th parallel (latitudinal line running roughly from northern California to New Jersey) as endangered under the Endangered Species Preservation Act of 1966 (16 U.S.C. 668aa-668cc). On December 31, 1972, DDT was banned from use in the United States by the Environmental Protection Agency.

Nationwide bald eagle surveys conducted in 1973 and 1974 revealed the declining

trend of bald eagle population numbers throughout the lower 48 states. We responded by listing the bald eagle throughout the lower 48 States as endangered except in Michigan, Minnesota, Wisconsin, Washington, and Oregon, where it was designated as threatened (43 FR 6233, February 14, 1978). Nesting populations of bald eagles have more recently been increasing throughout the U.S. Data from surveys conducted between 1963 and 1998 show that known active nest sites in the lower 48 states have grown from 417 to over 5,748 occupied BAs (USFWS 1995, p. 36001; USFWS 1999, p. 36457). Today, the Service estimates the population in the lower 48 states to be at approximately 7,066 breeding pairs (USFWS 2006, p. 8239).

The 1982 recovery plan for the Southwestern Recovery Region states that when the total reproduction for the eagle population within the Southwestern Recovery Region as a whole has effectively doubled to 10-12 young per year over a 5-year period, and the population range has expanded to include one or more river drainages in addition to the Salt and Verde River Systems, the southwestern bald eagle should be reclassified to threatened. The 1982 recovery plan indicated that Arizona was the only State in the recovery region containing nesting bald eagles, with 42 unverified historical nesting territories in the Salt and Verde River systems, and one occupied territory along the Colorado River. As discussed in the February 16, 2006, Federal Register notice reopening the comment period on the proposed rule to delist the bald eagle through its range (71 FR 8238), the downlisting goal established in the recovery plan for the southwestern bald eagle has been exceeded and on July 12, 1995, we reclassified the bald eagle from endangered to threatened in the lower 48 states (60 FR 36000).

The number of known BAs has increased from a low of 3 in 1971 to a high of 50 in 2006, while the number of occupied BAs increased from a low of 3 in 1971 to a high of 43 in 2006. The number of young hatched increased from a low of 0 in 1972 to a high of 55 in 2006 (AGFD 2006c, p. pp. 48-49; AGFD unpubl. data 2006). Productivity has also changed. Between 1975 and 1984, average productivity was 0.95 young per occupied BA. Between 1987 to 2005, average productivity was 0.78 young per occupied BA. These data take into account productivity for BAs throughout the Southwest, and that are not restricted to the Sonoran population of bald eagles evaluated under the petition.

While the number of BAs has increased, there was no expectation that these BAs would demonstrate a corresponding increase in reproductive performance. In part, this is because early monitoring detected BAs with the highest quality habitat that were easily discovered. Following an intensive survey effort, we now know of more BAs, but habitat conditions within them ranges from poor to excellent. As a result, we are now tracking productivity in BAs with a variety of habitat conditions, rather than tracking productivity in only those BAs that were easily detected and were in prime habitat. The result of having more thorough, representative data from more BAs in a variety of habitat types is that we show fewer "boom and bust" years. Productivity data between 1987 and 2005 indicates a more stabilized performance. For example, in 1971, with only three known BAs, productivity was 1.33. In 1972, with the same number of known BAs, 0.0. In 1973, productivity was at 1.5. By comparison, with more BAs known, productivity

fluctations now typically vary by only 0.20 to 0.30 (AGFD 2006c, pp. 48-49; AGFD unpubl. data 2006).

AGFD (2006c, p. 5) additionally notes that the change in productivity could be due to a difference in monitoring protocols. More importantly, they note that an average productivity rate of 0.78 young/occupied breeding area is consistent with the range of many other areas in the species range with larger bald eagle populations, including Minnesota, British Columbia, Interior Alaska, and Washington.

For the Sonoran population of bald eagles (i.e., excluding those BAs not considered within the area of analysis under this action), the number of occupied BAs increased from a low of 3 in 1971 to a high of 38 in 2006. Productivity for only those BAs within the Sonoran population is that same as that for the southwestern population up until 1994, when BAs outside of the Sonoran population were discovered. From 1994 forward, productivity within the Sonoran population has ranged between 0.62 and 1.06. reaching a high in 2004. Productivity remained high at 1.01 young per occupied BA for 2005 (AGFD 2003, p. 15; AGFD 2004, p. 6; AGFD 2005, p. 7; AGFD 2006b, pp. 1 - 3). The average annual productivity for this time period is at 0.78, which corresponds to that for the overall southwestern population.

Previous Federal Actions

On March 11, 1967 (32 FR 4001), bald eagles south of 40 degrees north latitude

were federally listed as an endangered species. Bald eagles north of this line were not listed at that time because those populations had not experienced the same threats and population declines as of 1967. On February 14, 1978, we listed the bald eagle as endangered in 43 states, and threatened in five others (43 FR 6233). Bald eagles were not listed in Alaska, and are not found in Hawaii. On July 12, 1995, we reclassified the bald eagle from endangered to threatened in the lower 48 states (60 FR 36000), under the Act. The bald eagle remained classified as threatened in Michigan, Minnesota, Wisconsin, Oregon, and Washington, as originally listed.

On July 6, 1999, we proposed to remove the bald eagle from the List of Endangered and Threatened Wildlife in the lower 48 states, including the southwest recovery region. The comment period on that proposal was re-opened on February 16, 2006 (71 FR 8238), and subsequently on May 16, 2006, through June 19, 2006.

Distinct Vertebrate Population Segment

We must consider a species for listing under the Act if available information indicates such an action might be warranted. "Species" is defined by the Act as including any species or subspecies of fish and wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). We, along with the National Marine Fisheries Service (now the National Oceanic and Atmospheric Administration - Fisheries), developed the Policy Regarding the Recognition of Distinct Vertebrate Population Segments (DPS Policy) (61 FR 4722,

February 7, 1996), to help us in determining what constitutes a DPS. Under this policy, we use three criteria to assess whether a population under consideration for listing may be recognized as a DPS: (1) Discreteness of the population in relation to the remainder of the species to which it belongs; (2) the significance of the population segment to the species to which it belongs; and (3) the population segment's conservation status in relation to the Act's standards for listing. Our policy further recognizes it may be appropriate to assign different classifications (i.e., threatened or endangered) to different DPSs of the same vertebrate taxon (61 FR 4721; February 7, 1996). In the Service's final rule reclassifying the bald eagle from endangered to threatened (July 12, 1995; 60 FR 36000), we determined that the southwestern recovery region was part of the same bald eagle population as that of the lower 48 States, and we determined it was appropriate to include it in the reclassification. Since the time of the July 12, 1995, rule, new information is available that could further inform this decision. In addition, the petitioned action references an area (i.e., Sonoran Desert) which differs from the area that was analyzed in the reclassification rule (i.e., southwestern recovery region), making it prudent to review the petition with respect to a DPS.

Discreteness

Our evaluation of the two conditions considered in the analysis of discreteness under the DPS Policy, based on information provided in the petition and available in our files, is presented below.

Discreteness Condition 1. The population segment is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation.

Ecological Factors

The petition notes the region occupied by Sonoran bald eagles is much drier and hotter than that of any other bald eagle population, and represents a significant departure from the habitat selected by bald eagles in the rest of North America. The petition concludes that, in order to adapt to high summer temperatures and to time breeding cycles to the accessibility and spawn of native fish (primarily suckers), Sonoran bald eagles breed earlier, nest earlier, and fledge their young sooner than bald eagles elsewhere (AGFD 1999a, 2000; Gerrard and Bortolotti 1988; Hunt et al. 1992; Stalmaster 1987; USFWS 2003b). In addition, the petition notes that, unlike bald eagles elsewhere in North America, Sonoran bald eagles use cliff nest sites and that 53 of 111 known nests, or 48%, are on cliffs or pinnacles. They further note the only other place this occurs is in the Aleutian Islands (Hunt et al. 1992).

Response to the Petition

The information provided in the petition on behavioral adaptations to the Sonoran desert is, in part, accurate. While it is true that Sonoran bald eagles initiate nesting earlier

than eagles in some parts of the country, Stalmaster (1987, p. 63) notes bald eagles in Florida initiate breeding activities in October, even earlier than Arizona bald eagles. Florida bald eagles also lay eggs earlier (Stalmaster 1987, p. 63; Gerrard and Bortolotti 1988 p. 76). Accordingly, Florida bald eagles hatch and fledge earlier than those in Arizona. Stalmaster (1987, p.63) concludes timing of various breeding events is tied to latitude of the nesting area, with eagles at more northern latitudes breeding at later dates.

With respect to cliff nesting, the information presented on the use of cliff nests is accurate. However, this is not necessarily a unique trait of Sonoran bald eagles. Gerrard and Bortolotti (1988, p. 41) note bald eagles in other areas may nest on cliffs if suitable trees are not available. Stalmaster (1987) noted exceptions to tree nests as well, but indicated that, while eagles in other areas may rarely use cliffs or other surfaces, this is an exception, whereas in Arizona, cliff nesting is common. In addition, bald eagles are known to nest on cliffs on the Channel Islands off California (L. F. Kiff in NOAA 2005).

Behavioral Factors

The petition provides information to indicate that the Sonoran bald eagles are reproductively isolated. Specifically, the petition contends that 352 out of 353 individuals (or 99.997%) objectively identified while participating in breeding activity in this population came from within the Sonoran bald eagle population. Additionally, the petition notes that, since 1977, biologists in Arizona have banded 256 nestlings with only one individual identified as having emigrated. According to the petition, this indicates

that 99.6% of individuals born into the Sonoran desert remain in the desert (AGFD 1999a, 2000). The petition states that, to date, evidence from the banding and identification of breeding adults defends the theory the Sonoran bald eagle breeding population is not supported or maintained by immigration from other states or regions. They quote AGFD (1999a, 2000) as indicating:

"…because adults return to the vicinity of their natal area to breed, the large distance between small breeding populations in the Southwest decreases the chance for movement between neighboring populations. Probably most convincing are the results from banding 256 nestlings over 20 years and identifying 372 breeding adults over 8 years. Only one individual from out-of-state entered the breeding population and only one left. Additionally, the proportion of breeding adults with color bands had steadily increased, while the presence of unmarked Bald Eagles has decreased. Thus, continued attention to the survivorship of all Arizona Bald Eagles is vital to the maintenance of our breeding population. We can not depend on immigration to Arizona from nearby states to make up for poor management in Arizona…"

The petition claims the AGFD (1994b) warned that repopulation of the Sonoran bald eagle population following a population crash would be highly unlikely, and quote the AGFD (1994b) as follows:

"Because Arizona continues to possess nearly the entire breeding population within the Southwestern Region, concerns remain over retaining the genetic integrity of

this population…Should a population crash occur in Arizona, the pool of eagles to repopulate the Southwest could be left to the few pairs in the neighboring states or Mexico. However, at this time, there is no documentation of eagles from these neighboring Southwestern states breeding in Arizona or vice versa."

The petition further notes natal site fidelity is common for bald eagles, noting that, in a study of nine bald eagle populations including thousands of banded birds, only two nestlings were found to have bred in other areas. One of these birds moved 331 km (205 miles) north from its natal site in the Greater Yellowstone Ecosystem (Harmata in litt.) while the other traveled 418 km (260 miles) south from its natal site near Charleston, South Carolina (T. Murphy, pers. comm., Wood in litt.). They conclude that the tendency for banded nestlings to breed within their natal populations is well known (Hunt et al. 1992).

Response to the Petition

The information in the petition appears to be accurate and reliable; however, it should be noted the only individual cited as entering the breeding population from out-of-state refers to a bald eagle from Texas (AGFD 2006, p. 27) that currently occupies the Luna BA, which is not part of the Sonoran bald eagle population. As a result, the appropriate conclusion is all birds objectively identified while participating in breeding activity in the Sonoran bald eagle population came from within the population. It should also be noted that sub-adult bald eagles do migrate and return annually. As noted above,

about 45 days after leaving the nest, young southwestern bald eagles migrate to Canada, northern California, Idaho, Montana, North and South Dakota, Oregon, Washington, and Wyoming (Hunt et al. 1992, p. A-104 – A-114), returning to Arizona in the Fall of the same year. They are known to repeat this behavior for a minimum of 2 years (Hunt et al. 1992a-112; p. A-122 – A-123). Resident adult bald eagles often stay in their BAs year-round, although local short-term migrations are common (AGFD 1999, p. 6).

We agree with the petitioners that, should the Sonoran bald eagle population experience a rapid decline, there are few eagles in neighboring southwestern states or Mexico which could serve as a source population for the Sonoran bald eagle population. Finally, we find the information from Harmata et al. (1999, p. 788) and Hunt et al. (1992, p. A-144) supports the discussion on the natal origins of breeding adults, and the probability that adult bald eagle will not immigrate to the Sonoran bald eagle population from surrounding southwestern states or farther.

Evidence of Genetic Discontinuity

With respect to genetic isolation, the petition found that the current understanding of genetics does not refute the discrete and isolated nature of the Desert Nesting bald eagle. The petition notes a review of all information regarding genetic analysis of the Southwestern Desert Nesting Bald Eagle reveals consistent uncertainty, and concludes current genetic data support no definitive conclusions concerning isolation or lack of isolation (CBD 2004e, Hunt et al. 1992, SWCBD 1999). The petition states that, while

no definitive conclusions are supported by the limited genetic data, this is not required under the current DPS policy. Specifically, the petition quotes from the policy:

"Thus, evidence of genetic distinctness or of the presence of genetically determined traits may be important in recognizing some DPS's, but the draft policy was not intended to always specifically require this kind of evidence in order for a DPS to be recognized…"

Similarly, the petition notes absolute reproductive isolation is not required under the policy, which states:

"The Services do not consider it appropriate to require absolute reproductive isolation as a prerequisite to recognizing a distinct population segment. This would be an impracticably stringent standard, and one that would not be satisfied even by some recognized species that are known to sustain a low frequency of interbreeding with related species…"

Response to the Petition

The information presented within the petition on completed genetic studies for bald eagles appears accurate and reliable. Hunt et al. (1992, pp. E-96 to E-110) contains the genetic work completed to date on the southwestern bald eagle population. Vyse (1992, p. E-100, E-101) notes the data are inconclusive, as evidenced by such statements

as “These findings must be assumed to be preliminary (and treated with due caution), because of a lack of information concerning sampling procedures. The results we have obtained could easily be explained by sampling procedures;” and “At present these data (HinfI/M-13) are too incomplete to be considered further.” In addition, Zegers et al. 1992, p. E-106 to E-109) notes that “Question 4…is difficult to answer with precision because of the different sample sizes between 1985 and 1990…this difference is possibly an artifact of the many fewer samples in 1985;” and “…six loci may not be enough to give a reliable estimate of the true genetic distance;” and “We feel caution should be exercised when interpreting these results due to the low numbers of individuals sampled from most states but especially because of the few loci examined.”

Furthermore, the language attributed to the DPS policy is quoted accurately.

Evidence of Morphological Discontinuity

The idea of “morphological discontinuity” refers to some difference in physical characteristics that may exist between two groups. The petition contends that quantitative measures of the physical differences between Sonoran bald eagles and bald eagles elsewhere offers evidence of morphological discontinuity. The petition sites quantitative measures of physical difference, stating that average weights of male bald eagles are 3.3 kilograms (kg) (7.3 pounds (lbs.)) in Arizona, 4.1 kg (9.0 lbs.) in California, and 4.7 kg (10.4 lbs.) in Alaska. Similarly, average weight for females is 4.5 kg (9.9 lbs.) in Arizona, 5.1 kg (11.2 lbs.) in California, and 5.8 kg (12.8 lbs.) in Alaska

(Hunt et al. 1992).

Response to the Petition

The information provided on size differences appears to be accurate and reliable, as found in Hunt et al. (1992, p. A-159). Stalmaster (1987, pp. 16-17) notes southern eagles are much smaller and lighter than their northern counterparts. This is consistent with Bergmann's Rule, which holds that animal size increases with increasing latitude. Gerrard and Bortolotti (1988, p. 14) note Florida birds are the smallest, with a gradation of small to large from south to north. The importance of this morphological difference and its potential isolating effects are discussed by Hunt et al. (1992, p. A-165), who notes morphological differences such as small size may be an adaptation related to desert conditions, noting a decision to release birds into Arizona from elsewhere should be considered only as a last resort, as the introduction of foreign genes into the Sonoran desert population might disrupt coadapted gene complexes specific to the desert population.

Discreteness Condition 2. It is delimited by international government boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

No specific information was identified in the petition for this category.

[Insert "significance" discussion here.]

Threats Analysis

Pursuant to section (4) of the Act, we may list a species, subspecies, or DPS of vertebrate taxa on the basis of any of the following five factors: (A) present or threatened destruction, modification, or curtailment of habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. The Act identifies the five factors to be considered, either singly or in combination, to determine whether a species may be threatened or endangered. Our evaluation of these threats in terms of the petitioned action to reclassify the Sonoran desert bald eagle from threatened to endangered, based on information provided in the petition and available in our files, is presented below. Throughout this finding we refer to the Sonoran desert population of the bald eagle, since that is the petitioned action; however, as noted above, this reference does not imply that we have determined pursuant to our DPS policy that it is a listable entity. Furthermore, although we have proposed the bald eagle in the lower 48 States for delisting, our petition finding does not address the proposed delisting or conditions that may occur if the delisting is finalized.

A. Present or Threatened Destruction, Modification, or Curtailment of the Species'

Habitat or Range

Development, Recreation, and Water Use

The petition notes that the southwest has already lost more than 90 percent of its historical riparian communities (AGFD 1993, Krueper 1993, Lofgren et al. 1990) and that the loss of riparian communities is continuing due to increasing development, dewatering via groundwater pumping and diversions, destructive cattle grazing, and lack of vegetation-rejuvenating floods. The petition contends that the Sonoran desert bald eagle population faces imminent and accelerating loss of increasing amounts of habitat vital to their long-term survival. Specifically, the petition notes that most of the BAs are located along the Salt and Verde rivers near the Phoenix metropolitan area and the towns of Cottonwood and Camp Verde in Yavapai County, where habitat loss is occurring due to the increasing human population in central Arizona. The petition notes that the human population in Maricopa County is expected to double to more than six million people over the next 30 years (Arizona Republic 1998). Growth in Cottonwood, on the Verde River, is projected to increase by 148 percent and in Camp Verde by 158 percent between 1994 and 2040 (Arizona Department of Economic Security 1994). The petition notes that increases in human populations of this magnitude will result in increased housing development, water demands, and recreational use.

The petitioners contend that development will affect the suitability of many BAs due to their proximity to areas with large human populations and projected population

growth rates. The petition notes that increased recreational use, development, and water use will follow increasing population sizes, and cites examples of past consultations, conducted by the Service under section 7 of the Act, addressing these issues.

The petition cites recent examples of recreational impacts to Sonoran desert bald eagle BAs, including river tubing on the Salt River, which increases the human presence near the Blue Point BA, as well as campground development at Roosevelt Lake, which could affect the Sheep and Tonto BAs. The petition cites, as development examples, a 360-home development and golf course within 1.0 mile (1.6 kilometers (km)) of the Box Bar BA; the development of lakeside resorts at Lake Pleasant near the Pleasant BA; and continued housing, road, and business developments along lower Tonto Creek near the Sheep and Tonto BAs (AGFD 1999a, 2000).

The petition notes that dewatering of the middle portion of the Verde River is accelerating so that flows have at times been reduced to 12 cubic feet per second (0.3 cubic meters per second) in summer months near the Camp Verde White Bridge gage (Verde Natural Resources Conservation District 1999). The petition contends that this dewatering is resulting in a reduction in base flows, and increased populations in Cottonwood and Camp Verde are leading to increased groundwater pumping. The petition indicates that groundwater pumping in Arizona has repeatedly been demonstrated to result in a depletion of surface flows, degradation and loss of riparian communities, and adverse impacts and local extirpation of aquatic flora and fauna (ADWR 1994, Ewing et al. 1994, Glennon 1995, Glennon and Maddock 1994, Hendrickson and

Minckley 1984, McGavock 1996, Miller 1961, Owen-Joyce and bell 1983, Stromberg 1993, Tellman et al. 1997).

The petition notes that increased water demand is expected to have adverse effects on flows within rivers and resulting impacts on riparian communities. The petition further notes that 59.5 percent of all known desert bald eagle nests in Arizona have been in riparian trees and snags (Driscoll 1999, E. Gardner, AGFD, pers. comm. 2006). The petition notes that bald eagles at 11 BAs, including the Box Bar, Coolidge, Doka, Fort McDowell, Perkinsville, Pinto, 76, Sheep, Sycamore, Tonto, and Winkelman BAs, nest solely in riparian trees, and that the cottonwood trees used for nesting in these BAs have become overmature, are dying, and are not being replaced (AGFD 1991a, 2000). The petition contends that the loss of habitat in these BAs is particularly damaging to the future stability of the Sonoran desert bald eagle population, as they have collectively contributed 22 percent of all recorded fledglings since 1971. The petition notes that the Fort McDowell BA has fledged 34 young, second only to the Blue Point BA, which has fledged 35 young (AGFD 1999a, 2000).

Substantial detail is provided in the petition regarding specific development activities and resulting effects to Sonoran desert bald eagle BAs. The petition notes that pressures associated with human population growth are increasing and will continue to do so as the human population increases.

Response to the Petition

The information provided by the petitioner indicating that human population growth is expected to continue in areas in close proximity or used by the Sonoran desert bald eagle population appears accurate and reliable. Human population growth is an on-going concern, and many of the bald eagle BAs in the Sonoran population are within close proximity to this anticipated growth, including the Granite Reef, Orme, Rodeo, Sycamore, Doka, Fort McDowell, Box Bar, Needle Rock, and Bartlett BAs on the Verde River, and the Bull Dog, Blue Point, and Horse Mesa BAs on the Salt River, as well as the Pleasant BA at Lake Pleasant. As noted in the petition, recreation, development, and water use activities are on-going and have increased since the bald eagle was listed. We have consulted on many of these actions through section 7 of the Act (including USFWS 1990b, 1996b, 1997b, 1998, 2001a and 2003b on water developments and USFWS 1993a for recreation, as cited in the petition). In addition, the AGFD's Projects Evaluation Program is available for Federal agencies or companies with a Federal nexus. This program can be used to evaluate the impacts of planned or future projects in areas where there may be a species of concern. The AGFD believes the program will help to ensure bald eagles and their habitat are considered and evaluated for possible effects from development projects (AGFD 2006c, p. 14).

Under section 7 of the Act, we have concluded to date that these actions would not jeopardize the continued existence of the bald eagle. The AGFD (2006c, p. 13) acknowledges that the need to accommodate human populations in proximity to a major metropolitan area like Phoenix will require ongoing management. However, they

conclude that the species can be managed even under this scenario through the "…awareness, collaboration, flexibility, planning, and willingness of all wildlife, land, and recreation managers (AGFD 2006c, p. 13)."

We work cooperatively with the AGFD and Federal land managers to minimize the potential threats to bald eagle BAs in close proximity to the major human population growth areas in Arizona by establishing BA closures and monitoring the sites. In 2006, the Bartlett, Box Bar, Granite Reef, Orme, and Tonto BAs were monitored through the Arizona Bald Eagle Nestwatch Program. The program not only interacts with members of the public to provide education, but can intervene if individuals approach the nests too closely. Similarly, the Southwest Bald Eagle Management Committee, composed of State, Tribal, Federal, private, and military agencies, meet twice each year to address ongoing and new threats, funding for needed efforts, and general issues affecting the bald eagle.

With the exception of the Pleasant and Bull Dog BAs, all of the BAs in close proximity to Phoenix successfully fledged young in 2006. One bird from the Bull Dog BA was successfully fledged following fostering in the Granite Reef BA. Orme, Rodeo, Doka, Fort McDowell, Box Bar, Blue Point, and Horse Mesa fledged one young each, while Sycamore, Needle Rock, and Bartlett produced two young each. Additionally, many of these BAs have successfully produced young for many years and, while nest failures do occur, their overall productivity remains high. For example, the Bartlett BA has fledged 28 young in 20 separate years between 1971 and 2002; the Blue Point BA has

fledged 38 young in 18 separate years between 1971 and 2002; and the Fort McDowell BA has fledged 41 young in 23 years between 1971 and 2002 (AGFD 2006b).

The petitioners presented reliable and accurate data on the use of riparian areas for bald eagles, and on the potential loss of nest trees. In the 11 BAs referenced by the petitioners, existing trees have become over-mature, are dying, and are not being replaced (AGFD 2006c, p. 12). The eagles in the Doka, Fort McDowell, Granite Reef, Rodeo, 76, and Sheep BAs currently nest in overmature live trees or snags with few available replacements. Trees may be lost to floodwaters, as at Fort McDowell in 1995 and 2005, or inundated due to reservoir level increases, as at the Pinto and Tonto BAs at Roosevelt Lake. In some cases, alternate trees are not available, as is the case at the Pinto BA. Housing communities and water-table reductions limit the available trees at the Tonto BA (AGFD 2006c, p. 13).

The AGFD (2006c, p. 13) notes that the Fort McDowell Yavapai Nation (FMYN) and Salt River Pima Maricopa Indian Community (SRPMIC) have submitted proposals to the Arizona Water Protection Fund and Wetlands Protection Fund to plant riparian trees. The U.S. Bureau of Reclamation is analyzing ground-water levels in the Pinto BA for possible cottonwood pole plantings, and has helped to implement riparian restoration strategies within the Tonto Creek Riparian Unit. Salt River Project has purchased property for riparian enhancements on Roosevelt Lake. The exact impacts of increased human population growth and riparian losses, as well as the success of planting efforts in riparian areas, are speculative at this point. Through these management efforts, however,

managing agencies can begin to minimize the factors impairing riparian regeneration.

We agree with the petitioner that human population growth, particularly in Maricopa and Yavapai counties, will continue. While we can anticipate the types of impacts that might occur, the exact results of those impacts on occupancy and productivity are speculative at this point. We remain concerned for BAs such as Bartlett, Blue Point, and Fort McDowell, which have contributed much to the productivity of bald eagles in the southwest. However, we find that productivity remains high despite the on-going nature of this threat. While this is an on-going threat, bald eagles have continued to survive and reproduce, as evidenced by the increased number of BAs throughout Arizona, and as evidenced by the productivity of the BAs outlined above. We therefore find that the petitioners did not provide substantial information to lead us to conclude that this threat has increased the likelihood of extinction for the Sonoran bald eagle population.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

No specific threats were identified in the petition for this category.

C. Disease or Predation

No specific threats were identified in the petition for this category.

D. Inadequacy of Existing Regulatory Mechanisms

Management

The petition states that the Sonoran desert population's survival is dependent, in good part, on heroic human support and management by the Arizona Bald Eagle Nestwatch Program (ABENWP). The petition notes that, over a two-year period in 1996 and 1997, 13,999 human activities and 4,000 gunshots were recorded within 0.5 mile (0.8 km) of 13 nests. The petition contends that signs, education, and the threat of fines are insufficient deterrents to people, and that monitoring by nestwatchers has been, and continues to be, a crucial component of Sonoran desert bald eagle management (AGFD 1999a, 2000).

The petition additionally notes that, since 1983, 16 percent of all Sonoran desert bald eagle fledglings have been saved by direct intervention of the ABENWP, with that intervention directly responsible for saving up to 60 percent of a single year's nestlings in some cases (USFWS 1992b). The petition notes that BAs such as Bartlett, Cliff, and 76 would rarely produce young without the aid of nestwatchers (Hunt et al. 1992).

The petition further notes that the ABENWP could become inadequate in the future as its funding is not secure. The funding comes from State grants such as AGFD's Heritage Fund, Federal agency contributions as mitigation for takings of the bald eagle under the Act, and volunteer funding. The petition finds that Heritage funding is insecure

because it is derived from the state lottery, and income from the lottery has been decreasing. Additionally, the petition notes that there have been legislative attempts to divert lottery funds from protective wildlife activities. The petition contends that the proposed removal of the bald eagle from the Federal endangered species list will terminate mandatory Federal agency funding as well; and provide an example where the Bureau of Reclamation has asked us for clarification on terminating funding for one of its projects (USFWS 1996c). The petition provides additional examples of the tenuous nature of funding for the ABENWP (AGFD 1994a, Arizona Republic 2003a, 2004c, 2004f) and states that there are few binding consultations for any agency to commit funding to existing bald eagle programs; funding assistance by agencies is primarily based upon available funds and where the agencies choose to allocate them. The petition notes that approximately 63 percent of all funds spent on bald eagles comes from agencies other than AGFD.

Response to Petition

Information in our files indicates that funding for the ABENWP comes from a variety of sources, including State Wildlife Grants, donations, AGFD Heritage Funds (State lottery), and matching funds for Federal grants. The petitioner's contention that funding for the program will be significantly reduced or discontinued in the future is speculative.

With regard to management and existing regulatory mechanisms, we evaluated

whether a difference exists between the regulatory mechanisms protecting the Sonoran desert bald eagle as a threatened species versus an endangered species (i.e., the petitioned action). As a threatened species with no special rule under section 4(d) of the Act, the Sonoran desert bald eagle is provided protection equal to that of an endangered species under the Act, except for penalties for illegal take. The prohibitions of the Act make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect, or to attempt any of these), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. With regard to other existing protections afforded the Sonoran bald eagle, please reference the February 16, 2006 (71 FR 8238), notice reopening the comment period on the proposed rule to delist the bald eagle. Within this notice we provide an in-depth discussion of the protections afforded the bald eagle by other Federal wildlife laws, including the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 688-668d) and the Migratory Bird Treat Act (MBTA) (16 U.S.C. 703-712). In summary, the BGEPA prohibits taking, or possession of and commerce in, bald and golden eagles. The MBTA implements various treaties and conventions between the U.S. and other countries and, unless permitted by regulations, it provides that it is unlawful to pursue, hunt, take, capture or kill; possess, offer to sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg or product, manufactured or not. Based on information provided by the petitioner and noted above, we find that no measurable difference exists between the regulatory protections

provided the Sonoran desert bald eagle in its current status as threatened versus endangered status (i.e., the petitioned action). Thus, we find the petitioner did not provide substantial information to lead us to believe that existing regulatory mechanisms are inadequate to protect the Sonoran desert bald eagle.

Habitual Violation of Law and Lack of Agency Resolve

The petition states that the Service has been engaged in efforts to downlist the bald eagle since at least 1989. The petition notes that an attitudinal change accompanied downlisting efforts and that this change contributes to increasing threats to the continued existence of the Sonoran desert bald eagle. Specifically, the petition contends that the attitudinal shift perpetuates: (a) cattle grazing within riparian habitat critical to the Sonoran desert bald eagles; (b) dam operations with water releases that are improperly timed for replenishment of riparian nest trees; (c) dewatering of remnant free-flowing rivers; (d) introduction of exotic fishes in native fish habitat; (e) continuing and increasing low-flying aircraft; and (f) approval of excessive amounts of take of Sonoran desert bald eagles. The petition provides detailed information for each of these categories, which is summarized below.

(a). Cattle Grazing Within Riparian Communities – The petition notes that cattle grazing in riparian areas is known to impede growth of replacement cottonwood nest trees (AGFD 1999a, 2000). The petition cites numerous biological opinions by the Service as stating that riparian community loss is due, in part, to livestock grazing, that

overgrazing continues as a threat and disturbance to bald eagles, and that overgrazing exacerbates adverse effects to riparian growth as well as to existing eagle nesting, perching, and foraging habitat (USFWS 2001a, 2002a, 2002b, 2003b).

(b). Dam Operations Result in Improperly Timed Water Releases – The petition notes that poorly timed water releases are a threat to riparian communities (Stromberg et al. 1991). The petition further notes that loss of riparian communities continues on the lower Verde and Salt rivers as a result of dam operations, and that maintenance of existing water development features such as dams or diversion structures is a continuing threat and disturbance to bald eagles (USFWS 2001a, 2003b). The petition contends that dam operations degrade existing eagle tree nesting and perching habitat and retard riparian regeneration; alter the hydrological regime of the lower Verde River by reducing the magnitude, frequency, and duration of high flow events; and restrict the flow of sediment, decreasing recruitment of early successional riparian species. The petition indicates that the effects of dams and their operation are the most important limiting factors in shaping the riparian plant community (Beauchamp 2002).

(c). Dewatering of Remnant, Free-flowing Rivers – The petition notes that flows in the Verde River have decreased to as low as 12 cubic feet per second (cfs) (3 cubic meters/second) during the month of June in some years (Verde Natural Resources Conservation District 1999). The petition also notes that increasing groundwater pumping by the growing population of Cottonwood and Camp Verde threatens to render sections of the Verde River intermittent (USFWS 1998), and that the Arizona Department

of Water Resources (ADWR) found that the Verde River baseflow is provided by groundwater discharge from the alluvium and Verde Formation, so any withdrawal from this aquifer is expected to eventually deplete Verde River flows (ADWR 1994). The petition again notes that the human population in Cottonwood and Camp Verde is expected to grow by 148 and 158 percent, respectively, between 1994 and 2040 (ADES 1994). The petition also notes that Prescott and Prescott Valley are developing a plan to use water from the Big Chino Basin, which may affect groundwater discharge into the upper Verde River (Arizona Republic 2000, 2001).

(d). Exotic Fish Introductions – The petition notes one study that found native fish populations to be a crucial component to suitable breeding habitat (Hunt et al. 1992). The petition indicates that at least 50 species of nonnative fish have been introduced into the Gila River basin (USFWS 2001a), with potentially another 10 to 15 incidental occurrences of other nonnative species. They note that nonnative species are considered to be extremely difficult, if not impossible, to remove once established (Aquatic Nuisance Species Task Force 1994). They also note that, in order to manage for native species, fish barriers are planned in areas like the upper Verde River, and that construction and maintenance of those barriers may result in take of bald eagles through harassment or harm due to the use of mechanized equipment, dredging of river channels to remove excess sediment, completion of required repairs, and added human activity to the area. A discussion under Factor E below indicates the petition's concern on the decline of native species, especially Sonora sucker and desert sucker and their use by bald eagles as prey.

(e). Continued and Increasing Low Flying Aircraft – The petition notes that there have been increases in low-flying aircraft, including private, military, and emergency aircraft, and that these aircraft are a concern for BAs on the lower Salt and Verde rivers and for those BAs under military training routes (AGFD 1999a, 2000). The petition cites examples of aircraft recorded less than 150 feet (45.7 m) over active nests. The noise disturbance and sonic booms produced by military aircraft can flush incubating adults from the nest. The petition notesthat the AGFD has worked with the Federal Aviation Administration and the Arizona Department of Transportation to establish a 2000-feet (610-meters) above-ground-level advisory along the Salt and Verde rivers, but although marked on Arizona aeronautical maps, this advisory is generally disregarded.

The petition notes that a biological opinion evaluated the Department of the Air Force proposal to widen and/or realign segments of military training routes in Arizona in 1994 (USFWS 1994c). According to the petition, the Service acknowledged the loss of nine eagles or eggs and 18 disturbances per breeding season each year over the 50-year life of the project. Disturbances in the biological opinion are defined as aircraft use that results in the interruption of breeding or foraging activities, including the flushing or displacing of eagles engaged in breeding or foraging activities (USFWS 1994c).

(f). Excessive Service Approval of Sonoran Desert Bald Eagle Deaths - The petition contends that the Service has approved Federal activities responsible for the deaths of at least 29 Sonoran desert bald eagles in the last decade and claims that Federal activities reviewed by the Service through section 7 of the Act will result in a cumulative

491 taking deaths over the next 50 years (USFWS 1992d, 1993a, 1994c, 1996b, 1997b).

Response to the Petition

As required by section 7 of the Act, we have consulted on the potential impacts of cattle grazing, dam operations, dewatering of rivers, introduction of exotic fishes in native fish habitat, and low-flying aircraft to eagles and their habitat. Such analyses within biological opinions do not indicate a lack of agency resolve. It is our responsibility, under the Act, to enter into consultation with Federal action agencies when activities they authorize, fund, or carry out may affect a listed species or its critical habitat. During this process we evaluate the impacts of the proposed project on listed species and determine how such impacts may be minimized and whether or not the project will jeopardize the continued existence of the species. If the project does not result in a jeopardy determination, we are responsible for working with action agencies to develop reasonable and prudent measures that will minimize adverse impacts of the action on the species under consultation. Reasonable and prudent measures are restricted to actions that result in only minor changes to the proposed project and are within the legal authority and jurisdiction of the agency or applicant to carry out.

The biological opinions cited within the petition analyze the impacts of various activities on the bald eagle and its habitat, assess whether incidental take will occur, make a jeopardy/no jeopardy determination, and provide reasonable and prudent measures to minimize incidental take, when appropriate. In addition, each consultation includes

sections on environmental baseline and cumulative effects which are used to evaluate the effects of the current action against the background of previous impacts and total expected take for the species. For each of these opinions, we provided a take statement and determined that the level of take authorized would not jeopardize the continued existence of the species, indicating that, although there may be some level of adverse effect, we do not believe the threats imposed by the various actions, when considered cumulatively with previous actions, were likely to jeopardize the continued existence of the species.

We do not believe, based on the above discussion, we have authorized excessive levels of take for bald eagles in the southwest. It is important to note that we believe the high level of take described in the petition with respect to the items E and F above is a misinterpretation on the part of the petitioners. The petition indicates that, for one consultation regarding expansion of military training routes, we allowed for the loss of 9 eagles or eggs and 18 nest disturbances annually over the 50-year life of the project. We provided a take statement for overhead flights that allows for take in the form of direct mortality of one adult or immature bald eagle, bald eagle nestling, or bald eagle egg, or two instances of disturbance per active nest per nest season. Incidental take in the form of harm of more than one eagle, nestling, or egg would require the Air Force to reconsult immediately. Further, the reasonable and prudent measures require the Air Force to avoid active bald eagle BAs during the breeding season. The total take for this opinion was therefore 1 bald eagle mortality over the life of the project and 18 disturbance events per year (2 at each of 9 BAs) outside of the breeding season each year for the life of the

project. The total mortality associated with this particular project is therefore 1 bald eagle, rather than the 450 attributed to it in the petition (USFWS 1994, p. 13).

With regard to existing protections afforded the bald eagle, we briefly discuss above the protections afforded the bald eagle by the Act as a threatened species and other Federal wildlife laws including the Bald and Golden Eagle Protection Act (BGEA) (16 U.S.C. 668-668d) and the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) and why we believe these protections are adequate to protect the bald eagle and maintain recovered population levels. For a more in-depth discussion of these protections, please reference the February 16, 2006, notice reopening the comment period on the proposed rule to delist the bald eagle (71 FR 8238).

We find that the petitioner did not provide substantial information to lead us to believe existing regulatory mechanisms are inadequate to protect the Sonoran desert bald eagle. We find that much of the information provided by the petitioner is speculative (e.g., reduced funding as a result of delisting) and not reliable (e.g., approval of excessive take). Additional information provided by the petitioner with regard to cattle grazing, dam operations, dewatering, introduction of exotic fishes, and low-flying aircraft does not establish a connection to the petitioned action to indicate that they are occurring at a level that is affecting the status of the Sonoran desert bald eagle to a point which renders the population in danger of extinction within the foreseeable future (i.e., “endangered” as defined under the Act). As noted above in the Species Description, the numbers of occupied BAs in the Sonoran population of bald eagles has continued to increase,

reaching a total of 34 occupied BAs in 2006. Productivity has remained relatively constant between 1987 and 2005, at an annual average of 0.78 young per occupied BA for the Sonoran population. This rate is within the range of many other states' productivity rates (AGFD 2006c, p. 5).

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Small Population Size

The petition notes that bald eagles once nested along every major river and large lake in the continental United States, and that they are no longer found in all areas of their historical range (Gerard and Bartolotti 1988). The petition further notes that the Sonoran desert population of the bald eagle is extremely small, without prospect for significant expansion. The petition notes that there are fewer than 60 nesting pairs of bald eagles in the population, and that the population occupying BAs may be overestimated. Their concern for overestimation of the population is based on the fact that members of breeding pairs recorded as occupying, but not breeding in a BA, may also occupy adjacent BAs. They note that two males were observed to move between BAs, and it is possible that adults recorded as occupying one BA may have come from an adjacent occupied BA.

The petition notes that BAs may have been occupied in years prior to their discovery, and that, if this is the case, the continued increase in the number of BAs

represents an increase in the number of discovered BAs, rather than an increase in the actual number of breeding birds. Undercounting of the population in previous years results in a greater discrepancy between past and current known numbers of breeding birds, which reflects as a greater increase in the population than that which might actually have occurred.

The petition further notes there is not enough surviving suitable habitat available to allow for the population to increase substantially or expand its distribution. They note that the AGFD has concluded that riparian community improvement and prey base modifications will be necessary before population sizes increase in Arizona (AGFD 1999, 2000). Thus, the petitioners believe that the Sonoran desert population will likely continue to remain small into the foreseeable future.

The petition notes that the small size of the Sonoran desert bald eagle population is, in and of itself, problematic. Using AGFD survival estimates of juveniles and nestlings, they estimate that there are approximately 166 individual eagles in the Sonoran desert population. The petition maintains that the population dynamics of such a population are essentially similar to those of an isolated metapopulation. The petition references a study on the effects of widespread habitat destruction on regional metapopulations of raptor populations, noting that the study found most species persist regionally as metapopulations or as sets of populations which are linked by dispersing individuals. This allows for recolonization of unoccupied habitat patches following local extinction events. However, the petition states that the loss of suitable habitat patches, or

disturbances in the surrounding landscape, can disrupt this process and lead to the regional extinction of a species. The cited study that the persistence of the species is at risk in significant portions of its range due to continued destruction and concomitant fragmentation of its habitat. As this pattern continues, a previously continuous population is separated into smaller, isolated demographic units that are at higher risk of local extinction due to demographic factors and/or environmental phenomena.

The petition contends that four "categories of analysis" are applicable to the question of the long-term survivability for raptors in general, including demographics, genetics, patch dynamics, and environmental change. The petition indicates that, based on population biology principles, if a typical vertebrate species such as a raptor is reduced to a genetically effective size of 50, it may suffer from inbreeding depression (Barrowclough and Coats 1985, Franklin 1980, Soule 1980), and further, that demographic stochasticity and inbreeding depression may interact, with the effects of one exacerbating the other, and hasten the decline of a population (Gilpin and Soule 1980). The petition states that populations that are reduced in size tend to lose genetic variability through genetic drift, reduced average individual heterozygosity, and a reduced pool of allelic variation. The petition contends that a population size of roughly 1,000 or larger is required to maintain all of the genetic variation of that population (Soule 1986). Below that size, the population will lose genetic variation at a rate proportional to the size of the population. The petition concludes that the Sonoran desert population has characteristics of extended adult longevity, high juvenile mortality, intense territoriality, and may be in a position to enter a geometric population decline (Lande 1987).

Mortality

The petition contends that the level of mortality in the Sonoran desert population is higher than can support a stable population, noting that adult mortality is higher than recruitment for the population. The petition states that, from 1987 to 1990, the rate of mortality for breeding adults has averaged 16 percent of the breeding population per year or 5.25 breeding adult mortalities per year. From 1991 to 1998, the rate of mortality was 11.9 percent, or 5.13 breeding adult mortalities per year (Beatty and Driscoll 1996, AGFD 1999a, 2000).

The petition further contends that the high presence of subadults in breeding pairs likely reflects the high adult mortality rates. The petition notes that Hunt et al. (1992) indicated that the presence of subadults in breeding pairs may indicate that excessive adult mortality is draining the floating segment of adult bald eagles. As a result, non-breeding (i.e., subadult) eagles are recruited into the breeding population, either forming a new pair bond with another non-breeding bird, or more frequently, replacing the mate of another breeding eagle. Twelve subadult-plumaged birds were observed holding territories in Arizona from 1987 to 1990, with seven subadult-plumaged birds observed holding territories in Arizona since 1991. The petition notes that the AGFD (1994b) found that, for 39 known vacancies of BAs, 15 (38.5 percent) were filled by adults and 24 (61.5 percent) by near-adults or subadults. The petition states that this pattern is not observed in other populations (Gerrard et al. 1992), and that in Saskatchewan, population

stability was maintained in part by bald eagles deferring first breeding to age six. The petition states that a 1992 survey of 14 bald eagle biologists throughout North America determined that the known incidence of breeding subadults outside of Arizona was 0.02 percent (Hunt et al. 1992). The petition concludes that the persistent presence of three- and four-year-old breeding bald eagles in Arizona has created concern for the health of the breeding population.

The petition contends that mortality for fledglings is also excessive, and that most Sonoran desert nestlings die prematurely. The petition notes that, according to AGFD data, from 1987 to 1998, 97 fledglings have been found dead (Hunt et al. 1992, Mesta et al. 1992, Beatty and Driscoll 1996b, AGFD 1991, 2000), and concludes that few Sonoran desert bald eagles survive to adulthood.

Productivity

The petition states that the reproductive rates for the Sonoran desert population are lower than those known for bald eagles in any other location. The petition indicates that the AGFD (1999a, 2000) determined that productivity rates are lower than those recorded throughout North America. For the Sonoran desert population, productivity rates from 1975 to 1984 were 0.92 young per occupied BA, but since then, the average productivity rate has been 0.78 young per occupied BA. The petition notes that productivity rates over a similar time span in Alaska, Florida, Washington, and Wisconsin averaged 0.96 young per occupied BA (Sprunt et al. 1973, McAllister et al.

1986, Kozie and Anderson 1991). The petition adds that, in some areas of the Sonoran desert population, productivity rates are even lower. For example, productivity along the Salt River declined to 0.26 young per occupied BA in the 1990s.

The petition further contends that BAs that formerly produced the majority of the fledglings are producing fewer fledglings, and that the most productive nests are in relatively close proximity to the rapidly growing Phoenix metropolitan area, so that survivability in these BAs is becoming increasingly problematic. The petition states that the Salt and Verde rivers support the bulk of the Sonoran desert population, and that it is in the lower parts of these drainages and nearby lakes where prey is most abundant and bald eagles are most productive. However, the proximity of these areas to Phoenix results in high recreation use. Due to predicted human population expansion (see factor A above), the petition predicts increased recreational and development pressures in close proximity to BAs along the Salt and Verde rivers (ADWR 1999a, 2000, Arizona Republic 2000, 2001; Chino Valley Review 2004; Prescott 2001; Prescott Daily Courier 2004a, 2004b, USFWS 2001a).

The petition further notes that Sonoran desert bald eagles on private lands are either not reproducing or are destined to fail. The petition cites the Winkelman BA as an example, noting that this BA on private property is now surrounded by housing, recreation, and industry. The petition states that the Camp Verde and Perkinsville BAs are also on private property, and are surrounded by private lands that have recently been sold or for which plans to sell are underway. The petition cites the reproductive history

of these BAs, noting that the Camp Verde and Winkelman BAs have a record of reproductive failure, and that the Perkinsville BA failed in 2002 and faces further threats from potential dewatering of the upper Verde River.

The petition includes information developed by the petitioners through the use of Vortex (version 9) modeling. The petition notes that the petitioners worked with AGFD data. Some of the model assumptions are that the population is a closed population and not demographically linked to other populations, and that there is a 1:1 ratio of males to females in the adult population. Because the petitioners determined that fecundity in the lower Verde and Salt BAs were inflated artificially by AGFD's stocking of exotic rainbow trout and Salt River Project's release of native fish captured from irrigation canals, BAs were divided into two groups of those on the lower Salt and Verde rivers, and those in other areas.

Additional detail regarding parameters used in and determinations derived from the model are in the petition. The petition notes that the model determined that juvenile and adult survival were the most critical parameters for the model. The petition indicates that the model demonstrates a high risk of extinction for the Sonoran desert population within the next 57 to 82 years.

Response to the Petition

The majority of the data and information presented in the petition is, in part,

consistent with the information in our files. Our information indicates, however, that there are no data supporting the statement that nests in private property are destined to fail simply due to their location relative to private land. While it is true that the Winkelman BA has been abandoned, the Camp Verde nest may have failed due to flooding. Two BAs on private land (Sheep and Beaver) are currently occupied and produced young in 2005 and 2006, respectively. In addition, we do not believe the population is overestimated due to individuals occupying more than one BA, noting that this behavior has been observed at only two BAs, and that the survey protocols and definition of occupancy currently in use limit this type of bias from occurring (E. Gardner, pers. comm. 2006, p. 3).

With respect to mortality, AGFD (2006c, p. 24) notes that adult mortality rates of 16 percent (from 1987 to 1990) and 12 percent (from 1991 to 1998) are higher than, but within the range of, other populations, which ranged from 5 percent in Northern California to 17 percent in Chesapeake Bay. Bald eagles in Maine experienced a nine percent mortality rate , while those in Coastal Alaska were a 12 percent mortality rate.

For nestling mortality, the petition concluded that few Sonoran desert bald eagles survive to adulthood. Stalmaster (1987, p. 143) found that, of 433 nestlings surveyed, an average of 85 percent survived to fledging, resulting in a mean nestling morality rate of 15 percent. By comparison, Hunt et al. (1992, p. C-108) concluded that the nestling mortality rate for the Arizona population was approximately 0.9 percent higher, or at 15.9 percent. Following Hunt's study, from 1991 to 2006, nestling mortality was

approximately 24 percent. While this represents an eight percent increase from data provided by Hunt et al. (1992, p. C-108), this may be due to increased monitoring effort through the ABENWP compared to earlier Arizona monitoring efforts and those efforts in other states. Daily monitoring through the ABENWP, monthly helicopter flights, and periodic on-the-ground visits throughout the year may have more accurately detected surviving fledglings and fledgling mortality than efforts that involved fewer follow-up visits. While we believe this nestling mortality rate warrants continued monitoring, a 76 percent survival rate does not indicate that most Sonoran desert nestlings die prematurely, as contended by the petition.

The information provided by AGFD (2006c) and Stalmaster (1987) indicate that mortality rates for bald eagles within the Sonoran breeding population are similar to those experienced in other populations in the United States, as are productivity rates. In addition, the population has continued to increase in terms of the number of breeding pairs and productivity, as noted above under the species description. Therefore, we find that the petitioner did not provide substantial information to indicate that the level of mortality and small population size place the Sonoran desert population in danger of becoming extinct. Therefore, with respect to this threat, we do not find the petitioned action may be warranted.

Declining Prey Base

The petition notes that the primary prey item for bald eagles during spring is the

native Arizona sucker population, consisting of desert and Sonora suckers. The petition cites recent reports indicating that Sonora sucker and desert sucker remain in approximately 73 percent and 74 percent, respectively, of the locations in which they were historically recorded, noting that they have a low probability of local extirpation, but fragmentation of their range and isolation of individual populations could further reduce their occurrence in a watershed (Desert Fishes Team 2004). With respect to the potential effects of a decline in the native fish prey base, the petition quotes the biological opinion completed for the Central Arizona Project (CAP) (USFWS 2001a). The petition indicates that in the CAP opinion that the Service concluded take of bald eagles was anticipated in the form of harm through alteration of the quantity and quality of the food base.

The petition cites, as a specific example, the effects of the decline of native suckers on the Salt River. The petition states that native suckers, which are a crucial prey species during the breeding season for bald eagles, became absent from the Salt River during the 1990s. The petition cites studies noting that the lack of native fish species along those portions of the Salt River occupied by bald eagles may have reduced productivity from 0.69 young per BA in the 1980s to 0.26 in the 1990s (Hunt et al. 1992).

Response to the Petition

The petition presents reliable and accurate information to indicate that native fishes are continuing to decline and effects to the prey base can have effects on the

Sonoran population of bald eagles. As outlined below, the effects of a reduced prey base seem to be affecting productivity rather than occupancy. Occupancy of these BAs remains fairly constant through 2002. Between discovery in 1978 and 2002, the Cedar Basin BA was unoccupied for only one year (1980). The Canyon and Pinal BAs were unoccupied for two years each (2001 and 2002 for the Canyon BA, 1986 and 2001 for Pinal). The Cibecue BA was unoccupied for three years (1974, 1976, and 1981). The Lone Pine and Redmond BAs have remained occupied since their discoveries in 1984 and 1975, respectively (AGFD 2006b, pp. 1-3). Two BAs, Ash and Mule Hoof, are no longer considered occupied. The Ash BA was occupied in 1984 and 1985, but has been unoccupied for ten consecutive years, and is no longer included in the list of occupied BAs. Mule Hoof was sporadically occupied in the 80s and the early 90s and was removed in 2002 after ten consecutive years of unoccupancy (AGFD 2006b, pp. 1-3).

However, while the upper Salt River BAs have remained largely occupied, productivity for the six BAs has remained low, declining after 1992 although remaining somewhat constant. From 1992 to 2002, between 0 and 3 total young have been produced each year (AGFD 2006b, pp.1-3).

Hunt et al. (1992, p. A-46) note that bald eagles in central Arizona forage on free-flowing and regulated rivers, reservoirs, small tributary streams, and on land, and that most, if not all pairs, use more than one of these environments during a given nesting season. Data indicate eagles commonly switch forage locations and/or prey species in response to changes in the distribution of prey and carrion. Hunt et al. (1992, p. A-46)

cite as an example a study on a male eagle from the Blue Point BA took a variety of prey on both reservoir and riverine habitats. While those BAs that rely primarily on riverine habitat for prey, such as those in the upper Salt River, are showing a reduction in productivity, overall productivity for bald eagles throughout Arizona and within the Sonoran population has remained stable between 1987 and 2005, and is comparable to that in other portions of the species range.

As the petitioners note, low productivity has been an issue on the upper Salt River since the 1980s. However, as noted above, the BAs in this area continue to remain occupied, and productivity, while low, remains fairly constant. Consequently, we do not perceive a new or increased threat due to a reduced prey base in this area. The situation on the upper Salt River is likely observed in other streams as well, where eagles rely primarily on rivers for foraging. This situation requires continued monitoring, and improvements need to be made in managing for native fishes, as well as in increasing overall productivity in these BAs. However, there has been increased productivity in other BAs, including some of those that also rely on rivers for foraging. This increase is in part attributable to the increase in the total number of BAs throughout Arizona. We therefore conclude that declines in the prey base for bald eagles does not warrant further consideration to reclassify the Sonoran population as endangered and that the petitioned action is not warranted based.

Contaminants

The petition claims that insecticides such as carbofuran, endosulfan, fenthion, phorate, and terbufos (American Bird Conservancy 2004a, 2004b; Center for Biological Diversity 2004c; EPA 2004c, 2004d, 2004e, 2004f; University of Arizona 2004; USDA 2001; USFWS 1995) continue to threaten the bald eagle, noting that hundreds of bald eagle deaths have been linked to carbofuran nationwide (American Bird Conservancy 2004b). The petition further states that DDT and its derivatives are still found in Arizona waterways, noting that toxic levels of DDE (a breakdown product of DDT) were found in an addled egg from the Sycamore BA in 1997 (AGFD 1999a, 2000; USGS 2004).

The petition notes that chlorfenapyr resulted in a decline in the number of eggs, viable embryos, and hatchlings of mallards, and that this chemical has been put to use within the United States (EPA 1999). The petition further states that toxic levels of mercury have been found in eggs from the Verde and Salt River BAs, and that mercury contamination has also been found in the Tonto Creek BA and Gila River at levels high enough to cause failure in eggs (AGFD 1999a, 2000). The petition notes that mercury concentrations in the Sonoran desert population were higher than those reported for most other North American populations (Grubb et al. 1990). The petition states that studies have determined that concentrations of mercury above 2 parts per million (ppm) are known to impair hatching (Newton 1979), and concentrations of 1.5 to 4.5 ppm are considered toxic (Ohlendorf 1993). Of thirteen eggs collected between 1994 and 1997, mercury levels ranged from 2.11 to 8.02 ppm for eggs from the Tower, 76, Pinal, and Winkelman BAs, and between 1.5 and 2.0 in three eggs from the Tower and Horseshoe BAs. They note that the Service considered concentrations of heavy metals to be a

concern in Arizona (USFWS 2001d).

The petition contends that mercury in bald eagles comes primarily from their prey, noting that contaminants studies detected elevated levels of mercury in prey items ranging from 0.06 to 0.97 micrograms per gram (ug/g) with highest mean levels recovered from Lake Pleasant, the Salt River, and Alamo Lake (King et al. 1991). The petition contends that these highest means were above the National Contaminant Biomonitoring Program's recommendation for no observable effects of 0.1 ug/g (Eisler 1987).

The petition notes that methylmercury is the form of mercury that accumulates at greater rates than inorganic mercury, and that most mercury in fish or wildlife organisms is in the form of methylmercury (Bloom 1989). They further note that methylmercury is more efficiently absorbed (Scheuhammer 1987) and preferentially retained (Weiner 1995).

The effects of mercury contamination have been studied in mallards. The petition cites a study on the effects of mallards that were fed 3.0 ppm methylmercury dicyandiamide for two years. They report that lesions resulted, including necrosis and hemorrhaging in the lining of the brain (Heinz and Locke 1975). The petition contends that the risk to bald eagles is increasing, noting that eggs collected between 1982 and 1984 had concentrations of approximately 0.39 – 1.26 ppm (K. King, pers. comm.), while those collected between 1994 and 1997 had concentrations ranging from 2.11 to 8.02

ppm (Beatty et al. unpub. data), up to six times higher than those collected between 1982 and 1984.

Response to the Petition

The petition provides information specific to bald eagles in Arizona to indicate that contaminants in the form of DDT and related breakdown products, and mercury continue to present a potential threat to the Sonoran bald eagle population. We find that some of the information presented by the petitioner is in error. With respect to carbofuran, it is important to that note the granular form that caused the extreme risks in grain-eating birds is not registered for use in Arizona (Extoxnet 2006, p. 1). Similarly, chlorfenapyr is not registered for use in Arizona (EPA 2006, p.1).

The discussion on mercury indicates that mercury levels were found to exceed 2 ppm for 13 eggs collected between 1994 and 1997. Our data indicate that these levels were exceeded for 10 eggs collected between 1994 and 2004 (AGFD 2006c, Table 4, p. 22). Mercury concentrations from 1998 to 2004 ranged from 0.55 to 2.9 for all 11 eggs collected in this timeframe at the Winkelman, Pinal, 76, Tonto, Tower, Fort McDowell, Horseshoe, Box Bar, Sycamore, East Verde, and Bartlett BAs (as well as the Luna BA, which falls outside of the Sonora population under consideration here). For the year in which mercury was detected, the majority of these nests failed. Successful production of young has occurred at the majority of these BAs following the year or years in which mercury was detected. Subsequent to mercury detection in 1996, the Winkelman BA

failed one year, was occupied with no eggs produced one year, and has remained unoccupied since. Since mercury detection in 1995, the Pinal BA experienced additional failures, but has since produced young, including in 2006. At the 76 BA, with mercury detections in 1995 and 1999, young were produced in 1996 through 1998, as well as in 2000 and 2001. With mercury detected at the Tonto BA in 2000 and 2001, young were produced in 2002, 2004, 2005, and 2006. Similar data are available for the Tower, Fort McDowell, Horseshoe, Box Bar, Sycamore, East Verde, and Bartlett BAs (AGFD 2006b, pp. 1-3; AGFD 2006c, pp. 48-49; AGFD 2006 unpubl. data). These data indicate that mercury detection at a given nest site may cause nest failure, but does not prevent future production of young.

DDE does continue to be detected in eggs, with the recent measurement of 4.23 ppm wet weight in one egg from the Rodeo BA in 2002. Weimeyer et al. (1984, p. 541) found that reductions in productivity occurred when DDE values in bald eagle eggs were between 3 and 5 ppm (wet weight). This level has been reached at the Tonto, Tower, Sycamore, and Rodeo BAs. The most complete DDE data set over time is from the Tower BA, where DDE concentrations declined from 3.2 ppm in 1994 to 0.91 ppm in 2001. The Tonto BA has produced young since DDE levels of 4.17 ppm wet weight were found in 2001. Following DDE levels of 3.20 ppm wet weight, the Tower BA produced young in 1996 through 2003, 2005, and 2006. At the Sycamore BA, DDE levels of 7.00 ppm wet weight were detected from an egg collected in 1997, but the BA produced young in 1998, 1999, and 2001 through 2006. The Rodeo BA, with DDE levels of 4.23 ppm in 2002, produced young in 2004 and 2006 (AGFD 2006c, Table 4, p.

22; 2006 unpubl. data).

The information presented on the mercury levels found in eggs from the Verde and Salt River BAs is generally accurate, as is that for the Tonto Creek and Gila River area. The information on DDT and its breakdown products is also generally accurate. Productivity at those BAs affected by high levels of mercury and DDE indicates that while nest failure may result when those levels are detected, young are produced in subsequent years. We have been evaluating the effects of mercury, DDE, and pesticides for many years, concluding they should be monitored but are not likely to jeopardize the continued existence of the species. We do not believe that the petitioner provided substantial information to indicate contaminant-related threats are present at a level that leads us to conclude that the petitioned action may be warranted.

Fishing Line and Tackle

The petition cites AGFD data that finds fishing line and tackle have been found in nests and have entangled bald eagles. There have been 62 separate instances involving entanglement, and 19 BAs with fishing line and/or tackle in nests or entangled individuals since 1986 (Hunt et al. 1992, Beatty 1992, Beatty and Driscoll 1994a, Beatty et al. 1998). The petition notes that mortalities have resulted from entanglement. The petition indicates that bald eagles encounter fishing line primarily by catching dead or dying fish with fishing line or tackle still attached, but that some birds have become entangled while perched on the shoreline or while feeding on dead shorebirds and

waterfowl that have themselves been entangled.

The petition states that the persistent occurrence of fishing line indicates the level of recreational pressure in many of the BAs and contends that, as the human population of central Arizona increases, so will the accompanying recreational demands on riparian areas (AGFD 1999a, 2000). The petition concludes that these increased recreational pressures will lead to even greater incidences of fishing line and tackle in nests and resulting adverse effects to Sonoran desert bald eagles.

Response to the Petition

The petition does not mention AGFD's monofilament recovery program. Although this program is voluntary, it has helped to educate anglers and reduce the amount of improperly disposed monofilament. For probable causes of mortality in bald eagles in Arizona between 1987 and 2005, monofilament is listed as causing one adult mortality and two nesting mortalities. It is ranked as the fifteenth most common cause of mortality, and responsible for 3 out of 281 deaths, or approximately 1.1 percent (AGFD 2006c, Table 6, p. 25). Monofilament is an ongoing problem for Sonoran desert bald eagles, but represents a minor threat. In part, we attribute this to the active management of the ABENWP, which we anticipate will continue. Additionally, wildlife personnel entering nests to conduct annual banding are instrumental in removing large quantities of monofilament (AGFD 2006c, p. 11). We find the petitioner did not provide substantial information to indicate that monofilament entanglement represents a threat that will result

in placing the Sonoran bald eagle population in danger of becoming extinct; therefore, we do not find that the petitioned action may be warranted based on this threat.

Climate Change

The petition notes that adaptation to the Southwest's combination of high temperature and low humidity is considered one of the characteristics that demonstrate the uniqueness of the Sonoran desert eagle population. The petition continues, however, to state that heat stress is also a leading cause of nestling mortalities. The petition notes that the Service (USFWS 1990b) determined that this situation will likely become more common, citing more days above 100˚ Fahrenheit in 1990 than 1989. The petitioners indicate that older nestlings have fallen from nest cliffs while attempting to reach shade or have fledged prematurely from nests without shade, usually resulting in their mortality. The petition cites studies indicating that 23 nestlings died and seven pre-fledged due to heat stress (Hunt et al. 1992). The petition cites additional information regarding heat-related mortalities.

In addition to heat, the petition notes that global warming will lead to more frequent drought cycles. They note that the Service (USFWS 2003b) determined that, between 1993 and 2001, eagles that depend on Roosevelt Lake for food had lower reproduction as the lake's surface area declined.

Response to the Petition

The petition presents some information to indicate that heat is a stressor for the Sonoran desert bald eagle, and that drought and declining water levels at reservoirs may result in decreased productivity. The AGFD notes that heat stress is the fourth-leading cause of known nestling mortalities, behind predation, parasitism, and starvation (E. Gardner, AGFD, pers. comm. 2006). It is ranked as the sixth greatest threat to bald eagles in all age classes (AGFD 2006c, Table 6, p. 25).

Productivity for the Sonoran population of bald eagles has reached its highest level yet for 2003 (at 0.62 young per occupied BA), 2004 (at 1.06 young per occupied BA), and 2005 (at 1.01 young per occupied BA), while the southwest is experiencing drought conditions. Climate variability and drought conditions may ultimately cause adverse effects to the bald eagle, however, the long-term effects of ongoing drought for desert-adapted birds like those of the Sonoran desert bald eagle population are unknown. We do not find that the petitioner provided substantial information to demonstrate that the level of threat posed by drought and increased heat will lead to adverse effects to the Sonoran desert population of bald eagles to a level which will cause them to be in danger of becoming extinct, and therefore we do not conclude that the petitioned action may be warranted based on this threat.

Eggshell Thinning

The petition contends that eggshell thinning remains a potential problem for bald

eagles in the Southwest. The petition cites Wiemeyer et al. (1984) in noting that eggshell thinning of greater than 10 percent causes problems in reproduction for other bald eagle populations. Similarly, the petition notes that studies have determined that a population would experience reproductive problems when eggshell thinning has become severe (15 to 20 percent) for a period of years (Anderson and Hickey 1972).

Mean eggshell thicknesses were compared with those from Baja California, which had a mean of 0.591 mm (0.024 in). The petition cites four studies on eggshell fragments for southwestern bald eagles. The results of these studies found eggshell thickness means of 0.539 mm (0.021 in) for 32 sets of eggshell fragments from 14 BAs between 1977 to 1985; 0.562 mm (0.022 in) for 71 sets of eggshell fragments from 23 BAs between 1987 and 1990; 0.552 mm (0.022 in) for 27 sets of eggshell fragments from 18 BAs between 1991 and 1992; and 0.534 mm (0.021 in) for 135 sets of shell fragments collected from 27 BAs between 1993 and 1997. In comparison with the Baja California mean eggshell thicknesses, these studies found a comparative 8.8 percent thinning for 1977 to 1985; 4.9 percent from 1987 to 1990; 6.6 percent in 1991 and 1992; and 9.7 percent from 1993 to 1997 (Grubb et al. 1990, Hunt et al. 1992, Mesta et al. 1992, Driscoll and Beatty, unpublished data). The petition notes that, since 1993, the annual percent thinning exceeded 10 percent in 1994 and 1995, and remained high at 9.9 percent in 1996 and 1997.

The petition notes that the cause of the eggshell thinning is not known at this time. While chlordane and DDE were the most frequently detected organochlorines in fish

sampled near eagle nests, they were present at levels below those associated with eggshell thinning in bald eagles. The petition further notes that studies found that trace elements, especially mercury, were elevated, as were aluminum, arsenic, copper, and zinc (Hunt et al. 1992, King et al. 1991).

Response to the Petition

AGFD (2006c, p. 23) notes that eggshell thinning exceeded ten percent on five separate occasions between 1993 and 2004. These occurred in 1994 at 10.7 percent, 1999 at 10.8 percent, in 2000 at 12.3 percent, in 2003 at 10.7 percent, and in 2004 at 10.0 percent. However, AGFD (2006c, p. 23) concludes that, since the ban of DDT in 1973, other factors may have a greater influence on productivity than DDT, but that egg collection and eggshell measurements will continue to ensure that the effects of DDT and other organochlorines do not affect productivity. We agree with this conclusion, and believe that eggshell thinning warrants further study and monitoring; however, at this time we are not aware of any data to indicate thinning at the levels cited is resulting in losses of eggs. We do not believe that the petition provided substantial information to indicate eggshell thinning will place the Sonoran desert bald eagle population in danger of becoming extinct, and therefore find the petitioned action is not warranted.

Finding

We have reviewed the petition, literature cited in the petition, and information in

our files. In evaluating this petition, we sought to determine if sufficient information was provided to warrant continued consideration and development of a 12-month rule. We find available genetic studies on bald eagles are dated, the sample size was small, and researchers conducting the studies found the results to be inconclusive. We therefore believe that the best available genetic information is inconclusive with regard to the discreteness of the Sonoran bald eagle population. However, we believe the petition presents substantial information on distinct morphological features of the Sonoran bald eagles with respect to size. Additionally, we believe the petition provides substantial information on natal site fidelity in breeding birds and the limited number of other eagles in neighboring southwestern states or Mexico. Finally, we believe the strongest argument presented by the petitioners for a positive discreteness finding is provided by the data indicating that 20 years of monitoring have resulted in the determination that no eagles have immigrated to and only one eagle has emigrated from the Sonoran bald eagle population. These three factors lead us to find that the petition contains significant information with respect to the discreteness requirements of the DPS policy to warrant considering the Sonoran bald eagle population as discrete from other bald eagle populations.

[Insert significance finding.]

Additionally, we find that the petition contained detailed information on numerous threats affecting the Sonoran population of bald eagles. Largely, we are in agreement that these threats are present, and in some cases are having some level of

effect on Sonoran bald eagles. However, as we discuss throughout our responses, no new information on threats was presented by the petitioner. Additionally, we did not find that the petition presented substantial information indicating an increase in the level of any of the threats to a degree which would cause the Sonoran population to be in danger of becoming extinct. The lack of information on new or escalating threats, combined with the increased number of occupied breeding areas and increased productivity levels, causes us to conclude that the Sonoran bald eagle population, while facing threats, continues to increase in numbers of adult birds and in productivity. We therefore find that the petition did not provide substantial information indicating that the petitioned action to reclassify the Sonoran desert bald eagle as endangered is warranted.

We encourage interested parties to continue to gather data that will assist with the conservation of the species. If you wish to provide information regarding the bald eagle, you may submit your information or materials to the Field Supervisor, Arizona Ecological Services Office (see ADDRESSES section above).

References Cited

A complete list of all references cited herein is available, upon request, from the Arizona Ecological Services Office of the U.S. Fish and Wildlife Service (see ADDRESSES section above).

Author

The primary authors of this notice are staff of the U.S. Fish and Wildlife Service, Arizona Ecological Services Office and Regional Office (see ADDRESSES).

Authority:

The authority for this action is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

Dated:_____

_____

Director, Fish and Wildlife Service