




**Susan
Jacobsen/RO/R2/FWS/DOI**

07/10/2006 02:41 PM

To Maricela Constantino/CBFO/R5/FWS/DOI@FWS
cc Douglas Krofta/ARL/R9/FWS/DOI@FWS, Sarah
Quamme/RO/R2/FWS/DOI@FWS
bcc
Subject Re: eagle finding 



90_Day_FR_Notice 7_10_06 surname RO.doc 90_Day_FR_Notice 7_10_06 SJ.doc Hi Maricela, here's the drafts as we just discussed. If anything changes between now and the time I leave I'll resend to you and Doug. Mary still needs to finish up adding the cites from the petitioner.

sj

Maricela Constantino/CBFO/R5/FWS/DOI



**Maricela
Constantino/CBFO/R5/FWS/D
OI**

07/10/2006 03:00 PM

To Susan Jacobsen/RO/R2/FWS/DOI@FWS
cc
Subject eagle finding

Susan,
Doug will be back in town tomorrow. I am looking at the BE finding now. Any chance you might be available for a call (along with Janet) sometime Tues or Wed afternoon? I'll check with Doug regarding his schedule when he gets in tomorrow.

Maricela

Maricela A. Constantino, Biologist
U.S. Fish and Wildlife Service
Endangered Species, Branch of Listing
4401 N. Fairfax Drive, MS 420
Arlington, VA 22203
703/358-1871 (phone)
703/358-1735 (fax)

----- Forwarded by Maricela Constantino/CBFO/R5/FWS/DOI on 07/10/2006 04:57 PM -----



**Douglas
Krofta/ARL/R9/FWS/DOI**

07/06/2006 01:21 PM

To Maricela Constantino/CBFO/R5/FWS/DOI@FWS
cc
Subject Fw: eagle finding

Douglas Krofta
U.S. Fish and Wildlife Service
Chief, Branch of Listing
4401 N. Fairfax Drive, Suite 420
Arlington, Virginia 22203

Phone: 703.358.2527
Fax: 703.358.1735
douglas_krofta@fws.gov

----- Forwarded by Douglas Krofta/ARL/R9/FWS/DOI on 07/06/2006 01:20 PM -----



**Susan
Jacobsen/RO/R2/FWS/DOI**
07/05/2006 06:40 PM

To Douglas Krofta/ARL/R9/FWS/DOI@FWS
cc
Subject eagle finding

[attachment "90_Day_FR_Notice 7-5 clean.doc" deleted by Maricela Constantino/CBFO/R5/FWS/DOI]
Hi Doug, as you read through the finding please note that the FO is working to add cites to the petitioners statements and some of our statements as well. Also, Janet read it and wanted to discuss after you read through it. Some of her suggestions were things that I thought about adding when I read through it but we both wanted to make sure that we were on the same page as you before doing that.

We can talk further tomorrow about this and Comal. I'm taking Comal home with me to finish up making revisions as we discussed today.

Thanks!
sj

-Code 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 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 bald eagle (Haliaeetus leucocephalus) 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). We find that the petition does not provide substantial scientific or commercial information indicating that the petitioned action ~~of designating a distinct~~

~~population segment of the bald eagle, listing that population as endangered, and designating critical habitat for that population segment~~ 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 the species or threats to it.

DATES: The finding announced in this document was made on [INSERT DATE THAT FINDING IS SIGNED]. ~~XXXXXXXX, 2006. We must receive your comments on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION 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.

~~———— All materials received, as well as supporting documentation used in preparation of this proposed rule, will be available for public inspection, by appointment, during normal business hours at U.S. Fish and Wildlife Service, 2321 W. Royal Palm Road, Suite 103, Phoenix, Arizona 85021.~~

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 for the DPS.

The Service requested clarification on the boundaries of the Sonoran population, as defined by the petitioners, on February 11, 2005. 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. Further action on this petition was precluded by higher listing priorities. On January 19, 2006, we received from the ~~petitioners~~[Center for Biological Diversity \(Center\)](#) -a 60-day Notice of Intent (NOI) to sue the Service for failure to respond to the petition. On March 27, 2006, the ~~Center for Biological Diversity~~ and ~~the~~ Maricopa Audubon Society filed a lawsuit against the U.S. Department of the Interior (DOI) and the Service for failure to respond within 90 days to the [petition](#)_[s1].

Species Information

The bald eagle (Haliaeetus leucocephalus) is the only species of sea eagle native to North America. Literally translated, Haliaeetus leucocephalus means white-headed sea eagle (USFWS 1995). 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 inches (1.8-2.6 meters) wingspan (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. ~~Their legs and feet are featherless and yellow.~~ Immature bald eagles are mostly dark brown and lack a white head and tail until they reach approximately five years of age (AGFD 2006, 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-rivers~~ as early as 1930.

The bald eagle population of the ~~s~~Southwest recovery region 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. Bald eagles wintering in New Mexico are often found in upland habitats.

Nationwide, bald eagles are known to nest primarily along seacoasts and lakeshores, ~~as well as along with~~ banks of rivers and streams ~~also used~~ (Stalmaster 1987, p. 120). In the Southwest, bald eagle breeding areas (BA) are located in close proximity to a variety of aquatic ~~sites~~ habitats, including reservoirs, regulated river systems, and free-flowing rivers and creeks. ~~The~~ term “breeding area” is used to define eagle nesting

sites and the area where they forage. 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 housed eagle nests (AGFD 1999, p. 7).

In Arizona, the majority of nests are located in the Upper and Lower Sonoran Life Zones, 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 (~~Cercidium~~ 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[s2][MER3]-).

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 ~~that in~~ 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 wintering in New Mexico are often found in upland habitats.~~

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 a perch and wait hunter in order to detect carrion or passively detect available live prey (Stalmaster 1987, p. 93).

Food strongly influences bald eagle productivity (Newton 1979, Hansen 1987). 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 [sSouthwest](#) 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 unavailable. In turn, flathead catfish populations have increased while other fish species have decreased. Consequently, productivity in the four bald eagle BAs on the upper Salt River has decreased from 1.12 in the 1980s to 0.29 in the 1990s.

Eagles in the [sSouthwest](#) 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, while there were more nests in trees, one study found that cliff nests were selected 73 percent of the time, while tree nests were selected 27 percent of the time. Additionally, eagles nesting on cliffs were found to be slightly more successful in raising young to fledgling, though the difference was not 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).

Bald eagles in the [sSouthwest](#) 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. [It is believed that this is 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. ~~It is believed that this is 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 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). One- to three-year-old subadults return to Arizona in September and October. 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 (USFWS 1999, p. 36455). Nationwide bald eagle surveys conducted in 1973 and 1974 revealed the declining trend of bald eagle population numbers throughout the lower 48 states. More recently however, the nesting populations of bald eagles have been increasing throughout the U.S. Surveys conducted between 1963 and 1998 show that 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 nationwide 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 reproductive effort has been effectively doubled to 10-12 young per year over a 5-year period, and the population range has been 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 rRiver sSystems, and one occupied territory along the Colorado River. As discussed in the February 16, 2006 (71 FR 8238), Federal Register notice reopening the comment period on the proposed delisting rule, the downlisting goal established in the recovery plan for the southwestern bald eagle has been exceeded. In 2003⁵, 46 occupied breeding areas were reported in New Mexico and Arizona alone^[MER4]. In 2004, the State of Arizona had 41 occupied breeding areas, and productivity was estimated at 0.75 young per occupied breeding area. In 2005, and the State of Arizona had 39 occupied breeding areas, and productivity was estimated at 0.97 young per occupied breeding area. Three new breeding areas were located in Arizona in 2006. The number of occupied breeding areas has more than doubled in the past 15 years.

The bald eagle was originally listed as endangered due to the species' reproductive failure caused by pesticide use (mainly dichloro-diphenyl-trichloroethane [DDT]), and unrestricted killing by humans. The widespread use of DDT and other persistent organochlorine compounds in the 1940s for mosquito control and as a general insecticide caused considerable declines in bald eagle populations. The pesticide DDT

breaks down into dichlorophenyl-dichloroethylene and accumulates in the fatty tissues of adult females, leading to impaired calcium release necessary for egg shell formation. Thinner egg shells led to reproductive failure, which is considered the primary cause of declines in the bald eagle population. DDT was banned in the United States in 1972 (USFWS 1995, p. 36000).

Previous Federal Action

On March 11, 1967 (32 FR 4001), bald eagles south of 40 degrees north latitude were 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, ~~the Service~~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~~the FWS 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 where it was originally listed as threatened.

On July 6, 1999, ~~the FWS~~we proposed to remove the bald eagle from the List of Endangered and Threatened Wildlife in the lower 48 states of the U.S., 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^[MER5], ~~and subsequently on XXXXXX, 2006 (XX FR XXXX).~~

Distinct Vertebrate Population Segment

We must consider a species for listing under the Act if available information indicates that 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 (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. Since the petition does not present substantial information to indicate listing as endangered may be warranted, as discussed below, we do not find it necessary to make a finding on the DPS issue.

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.

~~In making this finding, we first evaluated whether threats to the bald eagle as represented in the petition and other information may pose a concern with respect to its survival. Further detail and specific literature citations for information presented below are available in the petition.~~ 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, based on information provided in the petition and available in our files, is presented below. ~~Because we determined that the threats, as listed in the petition, are not likely to result in the extinction of the species, we believe that listing the southwestern population as endangered is not justified at this time.~~

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

Habitat or Range

Development, Recreation, and Water Use

The petition notes that the ~~s~~Southwest has already lost more than 90 percent of its historical riparian ~~habitat~~communities (AGFD 1993, Krueper 1993, Lofgren et al. 1990)~~,~~

and that the loss of riparian habitat 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 southwestern 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, in Maricopa County, the human population 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% and in Camp Verde by 158% 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 addressing these issues.

The petition cites recent examples of recreational impacts to southwestern 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 miles 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 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 that 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 ~~habitats~~[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 ~~habitats~~[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 southwestern 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 southwestern 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 with respect to this threat substantiates that human population growth is expected to continue in areas in close proximity or used by the southwestern bald eagle population appears accurate and is reliable. The petition details the expected increase in impacts of projects and activities related to an expanding human population that are expected to have an effect on bald eagle BAs in the southwestern population. The petition clarifies that the BAs to be affected by human population expansion are responsible for a large percentage of fledglings produced in the southwestern population. We agree with the~~

~~information presented in the petition on this point, but~~ However, we find that the ~~petitioner did not provide substantial information to lead us to believe~~ ~~do not believe~~ that the level of impacts of that growth on the southwestern bald eagle population ~~due to increased human population expansion will cause that population to be in danger of becoming extinct.~~ ~~in terms of the petitioned action may be warranted.~~ ~~will necessarily endanger the bald eagle.~~ This^[MER6] is because~~due to the fact that,~~ as discussed above, the numbers of occupied breeding areas and productivity of the southwestern bald eagle have continued to increase, as has the overall distribution of breeding bald eagles, even with human activities taking place in or in close proximity to breeding areas~~s exceeded the recovery goal established in the recovery plan~~^[s7] and the number of breeding areas has continued to increase^[MER8].

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

~~Intensive Management Required~~

The petition states that the southwestern 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 miles ~~(0.8X km)~~ of 13 nests ~~(AGFD 1999a, 2000)~~. 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 southwestern bald eagle management ~~(AGFD 1999a, 2000)~~.

The petition additionally notes that, since 1983, ~~sixteen-16~~ percent of all southwestern 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, mandatory 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 removal of the bald eagle from the endangered species list will terminate mandatory Federal agency funding as well; ~~for~~ and provide an example where the Bureau of Reclamation has ~~already~~ asked us for clarification ~~from the Service~~ on terminating funding ~~termination~~ for one of its projects ^(B9) USFWS 1996c. ~~The petition notes that the Service response to this request confirms that funding is required only until the bald eagle is delisted.~~ ^(s10) The petition provides additional examples of the tenuous nature of funding for the ABEN WP (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 – The information provided above by the petitioner is directed at a delisting scenario where funding may decrease if the protection of the Act is removed. However, the petitioned action is to reclassify the Sonoran desert bald eagle from its current status as a threatened species to endangered status-. Thus we find that the petitioner did not provide substantial relevant ^(MER11) information to lead us to believe that the existing regulatory mechanisms are inadequate to protect the southwestern bald eagle.

~~presented with respect to the need for, and funding vulnerability of, the ABENP is substantiated in the petition. The petition clarifies that the nestwatchers are instrumental in minimizing threats to BAs during the breeding season, which likely boosts the productivity levels of these BAs. There are currently no other existing regulatory mechanisms that accomplish this work. Consequently, should funding of the ABENP decrease or be eliminated, existing regulatory mechanisms will likely prove inadequate for continued protection of the southwestern population. The species will, however, continue to be protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.~~

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 this change contributes to the increasing threats to the continued existence of the southwestern bald eagle. Specifically, the petition contends that the attitudinal shift perpetuates: a) cattle grazing within riparian habitat critical to the southwestern 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 southwestern bald eagles. The petition provides detailed information for each of these categories, which is summarized below.

1. *Cattle Grazing Within Riparian ~~Communities~~Habitat* – 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 ~~habitat-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](#)).

2. *Dam Operations Result in Improperly Timed Water Releases* – The petition notes that poorly timed water releases are a threat to riparian ~~habitat~~communities ([Stromberg et al. 1991](#)). The petition further notes that ~~loss of~~ riparian ~~habitat~~communiti~~losses~~ continue 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](#)).

3. *Dewatering of Remnant, Free-flowing Rivers* – The petition notes that flows in the Verde River have decreased to as low as 12 cfs 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 [ADWR found](#) that the Verde River baseflow is provided by groundwater discharge from the alluvium and Verde Formation, so that 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](#)).

4. *Exotic Fish Introductions* – The petition notes that one study 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. 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 a prey base.

5. *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 under military training routes ([AGFD 1999a, 2000](#)). The petition cites examples of aircraft recorded less than 150 feet (~~X-45.7 mm~~) over active nests. The noise disturbance and sonic booms produced by military aircraft can flush incubating adults from the nest. The petition notes that the AGFD has worked with the Federal Aviation Administration and the Arizona Department of Transportation to establish a 2000-feet 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.

F. *Excessive ~~USFWS~~Service Approval of Southwestern Bald Eagle Deaths* - The petition contends that the ~~USFWS~~Service has approved Federal activities responsible for

the deaths of at least 29 southwestern bald eagles in the last decade, noting that these activities will result in a cumulative 491 taking deaths over the next 50 years ([USFWS 1992d, 1993a, 1994c, 1996b, 1997b](#)). The petition contends that 30 percent of occupied eagle nesting territories in Arizona may be adversely affected by these planned projects ([AGFD 1994b](#)).

Response to the Petition —~~With respect to cattle grazing, dam operations, dewatering of rivers, introduction of exotic fishes in native fish habitat, and low flying aircraft, we believe the petition presents substantial information on the various categories of threats to the species, noting the numerous consultations completed by the Service.~~ As required by section 7 of the Act, As noted within the petition, the Service has~~we have~~ recognized~~consulted~~ upon the potential impacts of ~~these cattle grazing, dam operations, dewatering of rivers, introduction of exotic fishes in native fish habitat, and low-flying aircraft threats~~ to eagles and their habitat. ~~over a period of several years.~~ Such analyses ~~We feel, however, that recognition of these threats by the Service~~ within biological opinions does not indicate a lack of agency resolve. It is our ~~the USFWS'~~ Service's 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 ~~w~~the Service ~~evaluates~~ the impact~~s~~ of the proposed project ~~threats~~ on listed species and ~~to~~ determine~~s~~ 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 the Service ~~is~~ responsible for developing reasonable and prudent measures that will minimize ~~the any~~ [B12] adverse

impacts of the action on the species under consultation. Reasonable and prudent measures are restricted to actions that ~~cause~~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 ~~analyzed~~determine 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, ~~with the Service~~ provided a take statement and determined that that level of take would not jeopardize the continued existence of the species, indicating that, although there may be some level of adverse effect, we do not believe that the threats imposed by the various actions, when considered cumulatively with previous actions, ~~were likely to jeopardize the continued existence of the~~would result in extinction of the species.

We do not believe, based on the above discussion, ~~that we that the Service has~~es authorized excessive levels of take for bald eagles in the ~~s~~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, ~~the we~~

~~Service~~ allowed for the loss of ~~nine~~9 eagles or eggs and 18 nest disturbances annually over the 50-year life of the project ([USFWS 1994c](#)). ~~W~~~~The Service~~ provided~~s~~ 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 ~~one~~1 bald eagle mortality over the life of the project and 18 disturbance events per year (~~two~~2 at each of ~~nine~~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 ~~one~~1 bald eagle, rather than the 450 attributed to it in the petition ([USFWS 1994c](#)).

With regard to existing protections afforded the bald eagle, we incorporate by 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 a thorough discussion of the protections afforded the bald eagle by 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. In summary, the BGEA 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. Furthermore, the petitioned action is to reclassify the southwestern bald eagle to endangered status as it is currently listed as threatened. As a threatened species, the bald eagle is provided full protection under the Act. 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 also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally.

~~Based upon the analysis above, w~~We find that the petitioner did not provide substantial information to lead us to believe that existing regulatory mechanisms are inadequate to protect the southwestern bald eagle. We find that portions of the information provided by the petitioner are not reliable (e.g., approval of excessive take) or are not relevant (e.g., reduced funding as a result of delisting) to the petitioned action. 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 they are occurring at a level that is affecting the status of the southwestern bald eagle. As noted above, the numbers of occupied breeding areas and productivity of the southwestern bald eagles have continued to increase, as has the overall distribution of breeding bald eagles, despite these activities.

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 Bartoletti 1988](#)). The petition further notes that the southwestern 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 that 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 that 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 ~~habitat~~-community improvement and prey base modifications will be necessary before population sizes increase in Arizona ([AGFD 1999, 2000](#)). Thus, the petitioners believe that the southwestern population will likely continue to remain small into the foreseeable future.

The petition notes that the small size of the southwestern bald eagle population is, in and of itself, problematic. ~~They estimate, using~~Using -AGFD survival estimates of juveniles and nestlings, ~~they estimate~~ that there are approximately 166 individual eagles in the southwestern population. The petition contends that the population is biologically, behaviorally, and ecologically isolated, so that the population faces challenges derived directly from its small size and isolation. The petition maintains that the population dynamics of such a population ~~is~~-are essentially similar to ~~that~~-those of an isolated metapopulation. The petition references a study on the examination of the effects of widespread habitat destruction on regional metapopulations of -raptor populations, noting that the study found that 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 study cited found 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 ~~the concern~~ 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 southwestern population has population 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 southwestern 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. 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 southwestern 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](#), [Nesta et al. 1992](#), [Beatty and Driscoll 1996b](#), [AGFD 1991, 2000](#)), and concludes that few southwestern bald eagles survive to adulthood.

Productivity

The petition states that the reproductive rates for the southwestern 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 southwestern population, productivity rates from 1975 to 1984 were 0.92 young per occupied BA, but that since then, the average productivity rate has been 0.78. 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 southwestern population, productivity rates are even lower. For example, productivity along the Salt River declined to 0.26 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 southwestern 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 southwestern 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 southwestern population within the next 57 to 82 years.

Response to the Petition – The data and information presented in the petition is, in part, consistent with the information in our files ~~on this point~~. ~~The petition presents substantial information to indicate that the southwestern population is small; productivity is lower than other bald eagle populations; and adult and nestling mortality are high. The petition cites work by other authors to highlight the potential problems encountered by small populations.~~ We do know that, for 2005, 39 of the 47 known BAs were occupied by nesting pairs of bald eagles and that ~~three new breeding areas were located in~~ Arizona in 2006. We are aware that the distribution and abundance of -breeding Arizona

bald eagles has improved over the past decade, but that overall population sizes will be limited by habitat and prey ~~availability~~^[s13]~~[MER14]~~. We note that historically and currently there is limited available habitat in the southwest due to the desert environment and associated lack of available water resources that create suitable bald eagle habitat.

Our information indicates, however, that there is 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, for example, 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 that 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. Finally, while reproductive rates are lower than known for any other area, it should be noted that this may be due, in part, to different monitoring protocols than those used in the rest of the nation, which may result in more accurate information for the southwest than other areas (E. Gardner, AGFD, pers. comm. 2006).

~~However, w~~In addition, w~~While we agree that~~ adult and nestling mortality are high, as discussed above, we also know that the population has continued to increase in terms of the number of breeding pairs and in its overall distribution. Therefore, w~~We~~ believe that, while mortality levels are high, they are at a level that may pose some threat ~~to the population's health,~~ e find that the petitioner did not provide substantial

information to indicate that the level of mortality and small population size place the southwestern population in danger of becoming extinct. Therefore, with respect to this threat, we do not find that in terms of the petitioned action may be warranted, but are not resulting in a danger of the population becoming extinct.

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 that 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 ([USFWS 2001a](#)). The petition indicates ~~that~~ in that opinion, the Service concluded that 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 in the 1980s to 0.26 in the 1990s ([Hunt et al. 1992](#)).

Response to the Petition ~~The petition presents substantial information to indicate that effects to the prey base are expected to have resulting effects on bald eagle, and that native fish species are continuing to decline. However, The petition presents reliable and accurate information to indicate that native fishes are continuing to decline and that effects to the prey base are expected to have resulting effects on southwestern bald eagles. However, this is an ongoing problem and, as stated previously, the number of breeding birds continues to increase, as has their overall distribution. WWe find that the petitioner did not provide substantial information to indicate that the prey base has been reduced to such a level that the southwestern bald eagle population is now in danger of becoming extinct. Therefore, we are not able to for us to determine that the petitioned action may be warranted based on this threat. This is based on the fact that the population has continued to increase in the number of breeding pairs and is exceeding recovery goals for reclassification we do not believe the information presented indicates that the prey base has been reduced to a level that would cause the southwestern bald eagle population to be in danger of becoming extinct~~ ^(s15).

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, 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 DDT and its derivatives are still found in Arizona waterways.

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 southwestern 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 (dry weight) 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 addled bald eagle eggs collected in

Arizona between 1995 and 1997 contained more than two to six times higher concentrations of mercury than eggs collected between 1982 and 1984.

Response to Petition ~~—The petition presents some substantial information on the presence and effects of contaminants on the southwestern bald eagle population.~~ The petition provides ~~substantial~~ information specific to bald eagles in Arizona to indicate that contaminants in the form of DDT and mercury continue to present a potential threat to the southwestern ~~population~~ bald eagles; however, we have been evaluating the effects of these types of actions for many years, always concluding that such activities are not likely to jeopardize the continued existence of the species. ~~W~~We do not believe that the petitioner provided substantial information to indicate ~~discussion provided in the petition offers sufficient proof to indicate~~ that contaminant-related threats are growing to the point that lead us to conclude that the petitioned action may be warranted ~~they would result in extinction of the southwestern population of bald eagle~~ This is based on the fact that the population, in spite of contaminant concerns, has continued to increase in terms of the number of breeding pairs and their overall distribution and is exceeding recovery goals for reclassification.

~~es.~~

Fishing Line and Tackle

The petition cites AGFD data that finds that 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 southwestern bald eagles.

Response to Petition —~~The petition presents substantial information indicating that fishing line and tackle have required intervention or caused mortality of bald eagles in the southwestern population. Information elsewhere in the petition substantiates the statement within this section that increased recreational pressures are likely to result from the anticipated human population growth in Phoenix, Cottonwood, and Camp Verde.~~

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 improper

disposal of monofilament. ~~M~~We believe that monofilament is can be will continue to be a problem for southwestern bald eagles, but this is an ongoing problem and, as stated previously, the number of breeding birds continues to increase, as does their overall distribution. In part, we attribute this to the active management of the ABENWP, which we anticipate will continue. We find that the petitioner did not provide substantial information to indicate that monofilament entanglement has increased to such a level that the southwestern bald eagle population is now in danger of becoming extinct. Therefore, we are not able to determine that the petitioned action may be warranted based on this threat.

~~do not believe that the petition provided sufficient information to conclude that this threat will lead to extinction of the species.~~

~~we do not believe that the petitioner provided substantial information to indicate that the level of threat posed by bald eagle entanglement in monofilament line would lead us to conclude that the petitioned action may be warranted. This is based on the fact that the population has continued to increase in the number of breeding pairs and is exceeding recovery goals for reclassification.~~

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 southwestern 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 Service~~The petitioners indicate that ~~noted that the heat makes it difficult for adult eagles to incubate eggs or brood young nestlings.~~ 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 that indicate 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 Petition – The petition presents some information to indicate that heat is a stressor for the southwestern ~~population~~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). Climate variability and drought conditions may cause adverse effects to bald eagle, however, the long-term effects of ongoing drought for desert-adapted birds like those of the southwestern bald eagle population are unknown. W~~We do not believe that the petitioner provided substantial information to demonstrate indicate that the level of threat posed by~~

~~heat stress drought and increased heat will necessarily lead to adverse effects to the southwestern population of bald eagles to a level which will cause them to be in danger of becoming extinct, and therefore we can not would lead us to conclude that the petitioned action may be warranted for this threat. This is based on the fact that the population has continued to increase in the number of breeding pairs and is exceeding recovery goals for reclassification.~~

~~We believe insufficient information was presented to indicate how this threat will increase in the future.~~

Eggshell Thinning

The petition contends that eggshell thinning remains a potential problem for bald eagles in the Southwest. The petition cites studies in noting that eggshell thinning greater than 10 percent causes problems in reproduction for other bald eagle populations ([Wiemeyer et al. 1984](#)). 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](#)).

The petition presents information on eggshell fragments collected from 32 southwestern BAs between 1977 and 1997. Mean eggshell thicknesses were compared with those from Baja California, which had a mean of 0.591 mm. The means for southwestern bald eagles were 0.539 mm (1977 to 1985); 0.562 mm (1987 to 1990);

0.552 mm (1991 and 1992); and 0.534 mm (1993 to 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. Sample sizes and collection periods varied between studies ([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 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 Petition —~~The petition provided substantial information indicating that eggshell thinning is a continuing problem for the southwestern bald eagle population, and that, although the cause is unknown, thinning has shown an increase from 4.9 in 1987 to 1990 to 9.7 in 1993 to 1997.~~ We believe that eggshell thinning warrants further study and monitoring; however, at this time we are not aware of any data ~~that~~ [to](#) indicates that thinning at these levels is resulting in losses of eggs. ~~- W~~[Thus, we do not believe that the petitioner provided substantial information to indicate that eggshell thinning will place](#)

the southwestern bald eagle population in danger of becoming extinct, and therefore find that the petitioned action is not may be warranted. This is based on the fact that the population has continued to increase in the number of breeding pairs and is exceeding recovery goals for reclassification.

Finding

We have reviewed the petition and literature cited in the petition. After this review and evaluation, we find the petition does not provide substantial information to indicate that the petitioned action may be warranted.~~present substantial information to indicate that there are numerous threats still facing the southwestern bald eagle population. However, we believe the petition does not present substantial information to indicate that these threats are increasing to a level that places the population in danger of becoming extinct. We Because find that~~ the level of threats was not demonstrated to be high enough in the ~~s~~Southwest for us to make a finding that the petitioned action may be to warranted~~consideration of listing of the southwestern population of the bald eagle as endangered, t.~~ As discussed throughout this finding, this is primarily based on the fact that the population has continued to increase in the number of breeding pairs and in its overall distributionis exceeding recovery goals for reclassification. The evaluation of whether or not the southwestern bald eagle population warrants designation as a distinct population segment is ~~not~~not relevant due to the analysis above and resulting negative finding, as is, subsequently, the need to designate critical habitat~~for that segment.~~

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 ~~is Steve Spangle,~~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: _____

~~Signed:~~

Director, Fish and Wildlife Service

~~Billing Code~~

(Endangered and Threatened Wildlife and Plants; Petition to List the Bald Eagle as a
Distinct Population Segment, List the Population as Endangered, and Designate Critical
Habitat)

Code 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 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 bald eagle (Haliaeetus leucocephalus) 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). 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 the species or threats to it.

DATES: The finding announced in this document was made on [INSERT DATE THAT FINDING IS SIGNED].

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

for the DPS.

The Service requested clarification on the boundaries of the Sonoran population, as defined by the petitioners, on February 11, 2005. 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. 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. 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 respond within 90 days to the petition.

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). 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 to 6.4 kilograms), and have a 66 to 96 inch (1.8-2.6 meter) wingspan (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 2006, 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 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. Bald eagles wintering in New Mexico are often found in upland habitats.

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 “breeding area” is used to define eagle nesting sites and the area where they forage. 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 housed eagle nests (AGFD 1999, p. 7).

In Arizona, the majority of nests are located in the Upper and Lower Sonoran Life Zones, 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 a perch and wait hunter in order to detect carrion or passively detect available live prey (Stalmaster 1987, p. 93).

Food strongly influences bald eagle productivity (Newton 1979, Hansen 1987). 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 unavailable. In turn, flathead catfish populations have increased while other fish species have decreased. Consequently, productivity in the four bald eagle BAs on the upper Salt River has decreased from 1.12 in the 1980s to 0.29 in the 1990s.

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, while there were more nests in trees, one study found that cliff nests were selected 73 percent of the time, while tree nests were selected 27 percent of the time. Additionally, eagles nesting on cliffs were found to be slightly more successful in raising young to fledgling, though the difference

was not 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).

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. It is believed that this is 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 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). One- to three-year-old subadults return to Arizona in September and October. 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 (USFWS 1999, p. 36455). Nationwide bald eagle surveys conducted in 1973 and 1974 revealed the declining trend of bald eagle population numbers throughout the lower 48 states. More recently however, the nesting populations of bald eagles have been increasing throughout the U.S. Surveys conducted between 1963 and 1998 show that 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 nationwide 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 reproductive effort 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 (71 FR 8238), Federal Register notice reopening the comment period on the proposed delisting rule, the downlisting goal established in the recovery plan for the southwestern bald eagle has been exceeded. In 2005, 46 occupied breeding areas were reported in New Mexico and Arizona alone and the State of Arizona had 39 occupied breeding areas, and productivity was estimated at 0.97 young per occupied breeding area. Three new breeding areas were located in Arizona in 2006. The number of occupied breeding areas has more than doubled in the past 15 years.

The bald eagle was originally listed as endangered due to the species' reproductive failure caused by pesticide use (mainly dichloro-diphenyl-trichloroethane [DDT]), and unrestricted killing by humans. The widespread use of DDT and other

persistent organochlorine compounds in the 1940s for mosquito control and as a general insecticide caused considerable declines in bald eagle populations. The pesticide DDT breaks down into dichlorophenyl-dichloroethylene and accumulates in the fatty tissues of adult females, leading to impaired calcium release necessary for egg shell formation. Thinner egg shells led to reproductive failure, which is considered the primary cause of declines in the bald eagle population. DDT was banned in the United States in 1972 (USFWS 1995, p. 36000).

Previous Federal Action

On March 11, 1967 (32 FR 4001), bald eagles south of 40 degrees north latitude were 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 where it was originally listed as threatened.

On July 6, 1999, we proposed to remove the bald eagle from the List of Endangered and Threatened Wildlife in the lower 48 states of the U.S., 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 that 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 (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. Since the petition does not present substantial information to indicate listing as endangered may be warranted, as discussed below, we do not find it necessary to make a finding on the DPS issue.

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, based on information provided in the petition and available in our files, is presented below.

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 southwestern 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, in Maricopa County, the human population 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% and in Camp Verde by 158% 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 addressing these issues.

The petition cites recent examples of recreational impacts to southwestern 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 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 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 that 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 southwestern 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 southwestern 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 that human population growth is expected to continue in areas in close proximity or used by the southwestern bald eagle population appears accurate and reliable. However, we find that the petitioner did not provide substantial information to lead us to believe that the level of impacts of that growth on the southwestern bald eagle population will cause that population to be in danger of becoming extinct. This is because, as discussed above, the numbers of occupied breeding areas and productivity of the southwestern bald eagle have continued to increase, as has the overall distribution of breeding bald eagles, even with human activities taking place in or in close proximity to breeding areas.

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 southwestern 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 southwestern bald eagle management (AGFD 1999a, 2000).

The petition additionally notes that, since 1983, 16 percent of all southwestern 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, mandatory 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 removal of the bald eagle from the 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 – The information provided above by the petitioner is directed at a delisting scenario where funding may decrease if the protection of the Act is removed. However, the petitioned action is to reclassify the Sonoran desert bald eagle from its current status as a threatened species to endangered status. Thus we find that the petitioner did not provide relevant information to lead us to believe that the existing

regulatory mechanisms are inadequate to protect the southwestern 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 this change contributes to the increasing threats to the continued existence of the southwestern bald eagle. Specifically, the petition contends that the attitudinal shift perpetuates: a) cattle grazing within riparian habitat critical to the southwestern 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 southwestern bald eagles. The petition provides detailed information for each of these categories, which is summarized below.

1. 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).

2. *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 continue 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).

3. *Dewatering of Remnant, Free-flowing Rivers* – The petition notes that flows in the Verde River have decreased to as low as 12 cfs 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 ADWR found that the Verde River baseflow is provided by groundwater discharge from the alluvium and Verde Formation, so that 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).

4. *Exotic Fish Introductions* – The petition notes that one study 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. 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 a prey base.

5. *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 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 notes that the AGFD has worked with the Federal Aviation Administration and the Arizona Department of Transportation to establish a 2000-feet 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.

F. Excessive Service Approval of Southwestern Bald Eagle Deaths - The petition contends that the Service has approved Federal activities responsible for the deaths of at least 29 southwestern bald eagles in the last decade, noting that these activities will result in a cumulative 491 taking deaths over the next 50 years (USFWS 1992d, 1993a, 1994c, 1996b, 1997b). The petition contends that 30 percent of occupied eagle nesting territories in Arizona may be adversely affected by these planned projects (AGFD 1994b).

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 does 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 developing reasonable and prudent measures that will minimize ~~any~~ 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 that level of take would not jeopardize the continued existence of the species, indicating that, although there may be some level of adverse effect, we do not believe that 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, that 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 (USFWS 1994c). 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 1994c).

With regard to existing protections afforded the bald eagle, we incorporate by 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 a thorough discussion of the protections afforded the bald eagle by 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. In summary, the BGEA 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. Furthermore, the petitioned action is to reclassify the southwestern bald eagle to endangered status as it is currently listed as threatened. As a threatened species, the bald eagle is provided full protection under the Act. 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 also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally.

We find that the petitioner did not provide substantial information to lead us to believe that existing regulatory mechanisms are inadequate to protect the southwestern bald eagle. We find that portions of the information provided by the petitioner are not reliable (e.g., approval of excessive take) or are not relevant (e.g., reduced funding as a result of delisting) to the petitioned action. 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 they are occurring at a level that is affecting the status of the southwestern bald eagle. As noted above, the numbers of occupied breeding areas and productivity of the southwestern bald eagles have continued to increase, as has the overall distribution of breeding bald eagles, despite these activities.

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 Bartoletti 1988). The petition further notes that the southwestern 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 that 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 that 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 southwestern population will likely continue to remain small into the foreseeable future.

The petition notes that the small size of the southwestern 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 southwestern population. The petition contends that the population is biologically, behaviorally, and ecologically isolated, so that the population faces challenges derived directly from its small size and isolation. 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 examination of the effects of widespread habitat destruction on regional metapopulations of raptor populations, noting that the study found that 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 study cited found 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 southwestern population has population 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 southwestern 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. 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 southwestern 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, Nesta et al. 1992, Beatty and Driscoll 1996b, AGFD 1991, 2000), and concludes that few southwestern bald eagles survive to adulthood.

Productivity

The petition states that the reproductive rates for the southwestern 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 southwestern population, productivity rates from 1975 to 1984 were 0.92 young per occupied BA, but that since then, the average productivity rate has been 0.78. 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 southwestern population, productivity rates are

even lower. For example, productivity along the Salt River declined to 0.26 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 southwestern 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 southwestern 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 southwestern population within the next 57 to 82 years.

Response to the Petition – The data and information presented in the petition is, in part, consistent with the information in our files. We do know that, for 2005, 39 of the 47 known BAs were occupied by nesting pairs of bald eagles and that three new breeding areas were located in Arizona in 2006. We are aware that the distribution and abundance of breeding Arizona bald eagles has improved over the past decade, but that overall

population sizes will be limited by habitat and prey availability. We note that historically and currently there is limited available habitat in the southwest due to the desert environment and associated lack of available water resources that create suitable bald eagle habitat.

Our information indicates, however, that there is 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, for example, 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 that 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. Finally, while reproductive rates are lower than known for any other area, it should be noted that this may be due, in part, to different monitoring protocols than those used in the rest of the nation, which may result in more accurate information for the southwest than other areas (E. Gardner, AGFD, pers. comm. 2006).

However, while adult and nestling mortality are high, as discussed above, the population has continued to increase in terms of the number of breeding pairs and in its overall distribution. Therefore, we find that the petitioner did not provide substantial information to indicate that the level of mortality and small population size place the southwestern population in danger of becoming extinct. Therefore, with respect to this

threat, we do not find that 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 that 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 (USFWS 2001a). The petition indicates ~~that~~ in that opinion, the Service concluded that 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 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 that effects to the prey base are expected to have resulting effects on southwestern bald eagles. However, this is an ongoing problem and, as stated previously, the number of breeding birds continues to increase, as has their overall distribution. We find that the petitioner did not provide substantial information to indicate that the prey base has been reduced to such a level that the southwestern bald eagle population is now in danger of becoming extinct. Therefore, we are not able to determine that the petitioned action may be warranted based on this threat.

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, 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 DDT and its derivatives are still found in Arizona waterways.

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 southwestern 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 (dry weight) 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 addled bald eagle eggs collected in Arizona between 1995 and 1997 contained more than two to six times higher concentrations of mercury than eggs collected between 1982 and 1984.

Response to Petition –The petition provides information specific to bald eagles in Arizona to indicate that contaminants in the form of DDT and mercury continue to present a potential threat to the southwestern bald eagles; however, we have been evaluating the effects of these types of actions for many years, always concluding that such activities are not likely to jeopardize the continued existence of the species. We do not believe that the petitioner provided substantial information to indicate that contaminant-related threats are growing to the point that lead us to conclude that the petitioned action may be warranted. This is based on the fact that the population, in spite

of contaminant concerns, has continued to increase in terms of the number of breeding pairs and their overall distribution.

.Fishing Line and Tackle

The petition cites AGFD data that finds that 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 southwestern bald eagles.

Response to 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 improper disposal of monofilament. Monofilament is a problem for southwestern bald eagles, but this is an ongoing problem and, as stated previously, the number of breeding birds continues to increase, as does their overall distribution. In part, we attribute this to the active management of the ABENWP, which we anticipate will continue. We find that the petitioner did not provide substantial information to indicate that monofilament entanglement has increased to such a level that the southwestern bald eagle population is now in danger of becoming extinct. Therefore, we are not able to determine 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 southwestern 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 that indicate 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 Petition – The petition presents some information to indicate that heat is a stressor for the southwestern 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). Climate variability and drought conditions may cause adverse effects to bald eagle, however, the long-term effects of ongoing drought for desert-adapted birds like those of the southwestern bald eagle population are unknown. We do not believe that the petitioner provided substantial information to demonstrate that the level of threat posed by drought and increased heat will necessarily lead to adverse effects to the southwestern population of bald eagles to a level which will cause them to be in danger of becoming extinct, and therefore we can not conclude that the petitioned action may be warranted for this threat.

Eggshell Thinning

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

eagles in the Southwest. The petition cites studies in noting that eggshell thinning greater than 10 percent causes problems in reproduction for other bald eagle populations (Wiemeyer et al. 1984). 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).

The petition presents information on eggshell fragments collected from 32 southwestern BAs between 1977 and 1997. Mean eggshell thicknesses were compared with those from Baja California, which had a mean of 0.591 mm. The means for southwestern bald eagles were 0.539 mm (1977 to 1985); 0.562 mm (1987 to 1990); 0.552 mm (1991 and 1992); and 0.534 mm (1993 to 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. Sample sizes and collection periods varied between studies (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 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 Petition – We believe that eggshell thinning warrants further study and monitoring; however, at this time we are not aware of any data ~~that~~ to indicate that thinning at these levels is resulting in losses of eggs. We do not believe that the petition provided substantial information to indicate that eggshell thinning will place the southwestern bald eagle population in danger of becoming extinct, and therefore find that the petitioned action is not warranted.

Finding

We have reviewed the petition and literature cited in the petition. After this review and evaluation, we find the petition does not provide substantial information to indicate that the petitioned action may be warranted. We find that the level of threat was not demonstrated to be high enough in the southwest for us to make a finding that the petitioned action may be warranted. As discussed throughout this finding, this is primarily based on the fact that the population has continued to increase in the number of breeding pairs and in its overall distribution. The evaluation of whether or not the southwestern bald eagle population warrants designation as a distinct population segment is not relevant due to the analysis above and resulting negative finding, as is, subsequently, the need to designate critical habitat.

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

(Endangered and Threatened Wildlife and Plants; Petition to List the Bald Eagle as a
Distinct Population Segment, List the Population as Endangered, and Designate Critical
Habitat)