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January 26, 2000

Memorandum

To: Director, Intermountain Region, National Park Service, Denver, Colorado

From: Field Supervisor

Subject: Section 7 Consultation for New Flight Rules in the Vicinity of Grand Canyon National Park

The U.S. Fish and Wildlife Service has reviewed your November 8, 1999, biological assessment on Proposed Revisions to Flight rules in the vicinity of Grand Canyon National Park, in Mohave and Coconino counties, Arizona, as specified in the Federal Register on July 9, 1999 (64 FR 37295-37301). Your request for formal section 7 consultation under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) was received on November 10, 1999. This consultation addresses the possible effects of partial implementation of a sequential process to restore natural quiet and protect park resources. This document represents the Service's biological opinion on the effects of that action on the experimental population of the California condor (*Gymnops californianus*) treated as threatened without critical habitat, the bald eagle (*Haliaeetus leucocephalus*) threatened without critical habitat, and the Mexican spotted owl (*Strix occidentalis lucida*) threatened without critical habitat, in accordance with section 7 of the Act.

The Service concurs with your determination that the proposed action is not likely to adversely affect the desert tortoise (*Gopherus [=Xerobates] agassizii*), Hualapai Mexican vole (*Microtus mexicanus hualpaiensis*), black-footed ferret (*Mustela nigripes*), southwestern willow flycatcher (*Empidonax traillii extimus*), or the Yuma clapper rail (*Rallus longirostris yumanensis*). If project plans change or additional information on the distribution of listed or proposed species becomes available, these determinations may need to be reconsidered. Your biological assessment also concluded no effect to fifteen listed plant and aquatic species. These species will not be addressed further in this consultation.

This biological opinion is based on information provided in the November 8, 1999, biological assessment, telephone conversations between our staffs, field investigations, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all

literature available on the species of concern, and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file in this office.

CONSULTATION HISTORY

The first consultation on this issue occurred with FAA in response to the Draft Environmental Assessment to the Noise Limitations for Aircraft Operations in the Vicinity of the Grand Canyon National Park, Transition to Quiet Technology, dated December 1996. The consultation concluded with a December 17, 1996, letter from this office to FAA, which concurred with the determination that the proposed project is not likely to adversely affect the California condor. This determination was based on the lack of documented bird/aircraft collisions over Grand Canyon, the expected flight patterns of the California condor, and the flight ceilings imposed by FAA regulation. No other species were addressed. This consultation only addresses the proposed changes as described below. This reinitiates consultation as a result of the June 1999, Supplemental Environmental Assessment - Special Flight Rules in the Vicinity of Grand Canyon National Park. Although FAA is the lead agency for this action, and the National Park Service is a cooperating agency, NPS is the lead agency for this consultation. With the November 8, 1999, request for consultation, NPS requested an expedited biological opinion from the Service. The Service responded with a letter to NPS on November 15 stating that all necessary information to initiate formal consultation had been received by this office. A draft biological opinion was mailed to NPS and the FAA on December 16, 1999.

On January 14, 2000, this office received a January 12 memorandum from you requesting some changes to the draft biological opinion. The comments were primarily points of clarification and have been incorporated as suggested.

BIOLOGICAL OPINION

After reviewing the current status of the California condor, bald eagle, and Mexican spotted owl, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, the Service concludes that this action, as proposed, is not likely to jeopardize the continued existence of these three species. No critical habitat exists for these three species, therefore, none will be affected.

DESCRIPTION OF THE PROPOSED ACTION

Air tours in and around the Grand Canyon produce \$250 million in revenue according to the Grand Canon Air Tour Council. The proposed action is part of a sequential process to restore natural quiet in the vicinity of Grand Canyon as mandated by Public Law 100-91, the National Parks Overflights Act. FAA, in cooperation with NPS is proposing changes to special flight rules in the vicinity of Grand Canyon National Park. Air tours over Grand Canyon National Park have been a popular activity for more than 30 years. While these flights have provided opportunities for park visitors to view the Grand Canyon from an aerial perspective, they have

also generated public concern over noise levels affecting the “visitor experience” as well as natural quiet and other resources in the park. As a result, Special Federal Aviation Regulations were established in 1987 and 1988 to address the airspace structure. The special flight rules area includes both the north and south rims of all of Marble and Grand Canyon from Lee’s Ferry to Pearce’s Ferry, from ground level to 14,499 feet (4,419.3 meters) in elevation. Flight free zones were also established.

More than 100,000 fixed-wing and helicopter tour flights will continue to fly over the Grand Canyon area annually. The majority of the flights occur between May and September. The 1997 estimate of operations (approaches, departures, circuits, overflights) were approximately 514 flights per day. The most flights ever recorded on a single day were 669 flights on August 11, 1997. Most aircraft must remain on fixed routes and altitudes within the special flight rules area. Altitudes for all aircraft will remain the same. Fixed-wing aircraft will fly about 400 ft (121.9 m) above ground level (AGL) over the South Rim, and about 800 to 900 ft (244 - 274 m) AGL over the North Rim. Helicopters will fly at less than 300 ft (91.4 m) AGL over the forested areas of the South Rim, and about 300-400 ft (91.4-121.9 m) AGL over forested areas of the North Rim.

About half of all flights originate from Clark County, Nevada. Most of the other flights originate from the Grand Canyon National Park Airport in Tusayan, Arizona. Other flights originate from Page, Arizona, and other locations in Utah, New Mexico, Arizona, and California. All tour flights must operate during daylight hours: from 8 am to 6 pm from May through September, and from 9 am to 5 pm from October through April.

Entities that own, manage, or have interest in lands which may be affected by this action include Grand Canyon National Park, Glen Canyon National Recreation area, Hualapai Tribe, Havasupai Tribe, Hopi Tribe, Navajo Nation, San Juan Southern Paiute, Kaibab Paiute, Shivwits Paiute, Paiute Tribes of Utah and the Zuni Tribe.

Most of the current airspace structure has been in place since 1988. Because of the rising number of air tour operations and resultant impacts to the natural quiet and visitor experience, some modifications to the special flight rules will be implemented. This phase of the proposal will also limit the number of commercial air tours to 1997-1998 levels. Other proposed changes include:

1. The areas with major route changes would be those portions of the park between the Little Colorado River confluence with the Colorado River, Saddle Mountain, then along the park’s northern boundary over the North Rim west of Saddle Mountain. Air tour operations would shift northward along the North Rim, with more aircraft flying closer to the rim on the eastern side of Walhalla Plateau. The number of air tours would be greatly reduced in the area of the confluence of the Little Colorado and Colorado rivers.
2. The southern portion of the “Dragon Corridor” would be shifted about 3 miles (4.8 km) to the west over Crystal Rapids.

3. The Blue 1 and 1A routes between Las Vegas and Tusayan, would be eliminated. Traffic on these routes would be expected to shift to the current Blue Direct route and a slightly modified Blue Direct South route (approximately 5 miles, 8.1 km, to the north at Grand Canyon West). More aircraft would be flying on the Blue Direct and Blue Direct South routes than currently if the proposed action is implemented.
4. Routes would be eliminated along the Colorado River from west of Separation Canyon to north of Diamond Creek.
5. Routes would be reconfigured in the vicinity of the Grand Canyon West development, but over 80% of the air traffic on these routes would continue to land at the Grand Canyon West Airport.

STATUS OF THE SPECIES

California condor

Information on the California condor is described in the 1996 Recovery Plan (USFWS 1996), the Environmental Assessment designating the experimental nonessential population for Arizona, and other documents, and is summarized below. The California condor was listed as an endangered species on March 11, 1967 (32 FR 4001), although the condor had long been recognized as a vanishing species (Cooper 1890, Koford 1953, Wilbur 1978). The California condor is a member of the family Cathartidae, the New World vultures, and is among the rarest bird species in North America. Adult condors can weigh up to 22 lbs (10 kg) and have a wingspan of 9.5 ft (2.9 meters). Condors are opportunistic scavengers, feeding only on carcasses (USFWS 1996).

The historic range of this large, formerly widespread vulture includes the California Coastal Ranges, Central Transverse Range, Southern Sierra Nevada Mountains, to Arizona, New Mexico, and Texas. Habitats include rocky cliffs and trees for roosting, open grasslands, and oak woodlands (USFWS 1996). There are currently approximately 160 California Condors in the world; 47 in the wild in California and Arizona and 113 in captive breeding facilities (World Center for Birds of Prey, Zoological Society of San Diego, and Los Angeles Zoo). The Arizona birds have been designated experimental, nonessential (10j), but for purposes of section 7 consultation on National Park Service lands are treated as threatened.

Bald eagle

The bald eagle south of the 40th parallel was listed as endangered under the Endangered Species Preservation Act of 1966, on March 11, 1967 (USFWS 1967), and was reclassified to threatened status on July 12, 1995 (USFWS 1995a). No critical habitat has been designated for this species. The bald eagle was proposed for removal from the threatened and endangered species list on July 6, 1999 (USFWS 1999). The bald eagle is a large bird of prey that historically ranged and nested

throughout North America except extreme northern Alaska and Canada, and central and southern Mexico.

The bald eagle occurs in association with aquatic ecosystems, frequenting estuaries, lakes, reservoirs, major rivers systems, and some seacoast habitats. Generally, suitable habitats for bald eagles include those areas which provide an adequate food base of fish, waterfowl, and/or carrion, with large trees for perches and nest sites. In winter, bald eagles often congregate at specific wintering sites that are generally close to open water and offer good perch trees and night roosts (USFWS 1995a).

Since listing, bald eagles have increased in number and expanded in range due to the banning of DDT and other persistent organochlorine compounds, habitat protection, and additional recovery efforts. The Service estimates that the breeding population exceeded 5,748 occupied breeding areas in 1998 (USFWS 1999).

Although not considered a separate subspecies, bald eagles in the southwestern United States have been considered as a distinct population for the purposes of consultation and recovery efforts under the Act. The Service proposed delisting of the bald eagle in the lower 48 states including Arizona, stating that the number of breeding pairs in the Southwestern Recovery Unit has more than doubled in the last 15 years (USFWS 1999).

All breeding areas in Arizona are located in close proximity to a variety of aquatic habitats including reservoirs, regulated river systems, and free-flowing rivers and creeks. The alteration of natural river systems has had both beneficial and detrimental effects to the bald eagle. While large portions of riparian forests were inundated or otherwise destroyed following construction of dams and other water developments, the reservoirs created by these structures enhance habitat for the waterfowl and fish species (often nonnative species) on which bald eagles prey. Bald eagles in Arizona consume a diversity of food items. However, their primary food is fish, which are generally consumed twice as often as birds, and four times as often as mammals.

Arizona bald eagles demonstrate some unique behavioral characteristics in contrast to most bald eagles in the remaining lower 48 states. Eagles in the Southwest frequently construct nests on cliffs. 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. Bald eagles in southern states establish their breeding territory in December or January and lay eggs in January or February, which is early compared with bald eagles in more northerly areas. This may be a behavioral adaptation so chicks can avoid the extreme desert heat of midsummer. Young eagles will remain in the vicinity of the nest until June (Hunt *et al.* 1992).

In addition to breeding bald eagles, Arizona provides habitat for wintering bald eagles, which migrate through the state between October and April each year. In 1997, the standardized statewide Arizona winter count totaled 343 bald eagles, and in 1998, 209 birds were recorded (Beatty and Driscoll 1999).

The establishment of the Arizona Bald Eagle Management Committee (ABEMC) and Arizona Bald Eagle Nestwatch Program (ABENWP) has been essential to the success of recovery efforts for eagles in the Southwest. The ABEMC includes a number of Federal, State, Tribal, and other governmental agencies and partners, and has been effective at implementing breeding area closures to reduce the threat of harassment to nesting eagles. Intervention has proven to be very effective in maintaining the southwestern bald eagle population.

Even though the bald eagle has been reclassified to threatened, and the status of the birds in the Southwest is on an upward trend, the Arizona population remains small and under threat from a variety of factors. Human disturbance of bald eagles is a continuing threat which may increase as numbers of bald eagles increase and human development continues to expand into rural areas (USFWS 1999). The bald eagle population in Arizona is exposed to increasing hazards from the regionally increasing human population. These include extensive loss and modification of riparian breeding and foraging habitat through clearing of vegetation, changes in groundwater levels, and changes in water quality. Threats persist in Arizona largely due to the proximity of bald eagle breeding areas to major human population centers and recreation areas. Additionally, because water is a scarce resource in the Southwest, recreation is concentrated along available water courses. Some of the continuing threats and disturbances to bald eagles include entanglement in monofilament fish line and fish tackle; overgrazing and related degradation of riparian vegetation; malicious and accidental harassment, including shooting, off-road vehicles, recreational activities (especially watercraft), and low-level aircraft overflights; alteration of aquatic and riparian systems for water distribution systems and maintenance of existing water development features such as dams or diversion structures; collisions with transmission lines; poisoning; and electrocution (Beatty *et al.* 1999; Stahlmaster 1987). Concentrations of heavy metals in bald eagle eggs are a concern in Arizona. Thirteen Arizona bald eagle eggs collected from 1994 to 1997 contained from 1.01 to 8.02 ppm dry weight mercury (Beatty *et al.* unpubl. data). Concentrations in the egg are highly correlated with risk to reproduction.

In Arizona, the use of breeding area closures and close monitoring of nest sites through the ABENWP has been and will continue to be essential to the recovery of the species. Ensuring the longevity of the ABENWP is of primary concern to the Service (USFWS 1999).

Mexican spotted owl

Information on the species description, life history, population dynamics, status and distribution, rangewide trends and other information are presented in literature, other biological opinions issued by this office, and other sources and is summarized below.

The Mexican spotted owl was listed as threatened on March 16, 1993 (58 FR 14248). Critical habitat was designated for the species on June 6, 1995 (60 FR 29914) (USFWS 1995b), but was withdrawn in a recent Federal Register notice (63 FR 14378). The Mexican spotted owl is mottled in appearance with irregular white and brown spots on its abdomen, back, and head. The spots of the Mexican spotted owl are larger and more numerous than in the other two subspecies

giving it a lighter appearance. Several thin white bands mark an otherwise brown tail. Unlike most owls, spotted owls have dark eyes.

The Mexican spotted owl is distinguished from the California and northern subspecies chiefly by geographic distribution and plumage. The Mexican spotted owl has the largest geographic range of the three subspecies. The range extends from the southern Rocky Mountains in Colorado and the Colorado Plateau in southern Utah southward through Arizona and New Mexico and, discontinuously through the Sierra Madre Occidental and Oriental to the mountains at the southern end of the Mexican Plateau. There are no estimates of the owl's historic population size. Its historic range and present distribution are thought to be similar (USFWS 1993).

The current known range of the Mexican spotted owl extends north from Aguascalientes, Mexico through the mountains of Arizona, New Mexico, and western Texas, to the canyons of southern Utah and southwestern Colorado, and the Front Range of central Colorado. Although this range covers a broad area of the southwestern United States and Mexico, much remains unknown about the species' distribution within this range. This is especially true in Mexico where much of the owl's range has not been surveyed. Information gaps also exist for the species' distribution within the United States. It is apparent that the owl occupies a fragmented distribution throughout its United States range corresponding to the availability of forested mountains and canyons, and in some cases, rocky canyon lands. The primary administrator of lands supporting owls in the United States is the Forest Service. According to the Mexican Spotted Owl Recovery Plan (USFWS 1995c), 91 percent of owls known to exist in the United States between 1990 and 1993 occur on land administered by the Forest Service.

A reliable estimate of the numbers of owls throughout its entire range is not currently available due to limited information. Owl surveys conducted from 1990 through 1993 indicate that the species persists in most locations reported prior to 1989, with the exception of riparian habitats in the lowlands of Arizona and New Mexico, and all previously occupied areas in the southern states of Mexico. Increased survey efforts have resulted in additional sightings for all recovery units. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico in 1990 using information gathered by Region 3 of the Forest Service. Fletcher's calculations were modified by the Service (USFWS 1991), who estimated that there was a total of 2,160 owls in the United States. While the number of owls throughout its range is currently not available, the Recovery Plan reports an estimate of owl sites based on 1990 - 1993 data. An owl "site" is defined as "a visual sighting of at least one adult owl or a minimum of two auditory detections in the same vicinity in the same year." Surveys from 1990 through 1993 indicate one or more owls have been observed at a minimum of 758 sites in the United States and 19 sites in Mexico. Total known numbers in the United States range from 777 individuals, assuming each known site was occupied by a single owl, to 1,554 individuals, assuming each known site was occupied by a pair of owls.

Mexican spotted owls breed sporadically and do not nest every year. Mexican spotted owl reproductive chronology varies somewhat across the range of the owl. In Arizona, courtship

apparently begins in March with pairs roosting together during the day and calling to each other at dusk (Ganey 1988). Eggs are laid in late March or, more typically, early April. Incubation begins shortly after the first egg is laid, and is performed entirely by the female (Ganey 1988). The incubation period for the Mexican spotted owl is assumed to be 30 days (Ganey 1988). During incubation and the first half of the brooding period, the female leaves the nest only to defecate, regurgitate pellets, or to receive prey from the male, who does all of the foraging (Forsman *et al.* 1984, Ganey 1988). Eggs usually hatch in early May, with nestlings fledgling four to five weeks later, and then dispersing in mid-September to early October (Ganey 1988).

Mexican spotted owls nest, roost, forage, and disperse in a diverse array of biotic communities. Nesting habitat is typically in areas with complex forest structure or rocky canyons, and contain mature or old-growth stands which are uneven-aged, multi-storied, and have high canopy closure (Ganey and Balda 1989, USFWS 1991). In the northern portion of the range (southern Utah and Colorado), most nests are in caves or on cliff ledges in steep-walled canyons. Elsewhere, the majority of nests appear to be in Douglas-fir trees (Fletcher and Hollis 1994, Seamans and Gutierrez 1995). A wider variety of tree species is used for roosting; however, Douglas-fir is the most commonly used species (Ganey 1988, Fletcher and Hollis 1994). Foraging owls use a wider variety of forest conditions than for nesting or roosting.

Mexican spotted owls consume a variety of prey throughout their range but commonly eat small and medium-sized rodents such as woodrats (*Neotoma* spp.), peromyscid mice, and microtine voles. They may also consume bats, birds, reptiles, and arthropods (Ward and Block 1995). A diverse prey base is dependant on the availability and quality of diverse habitats.

The Mexican Spotted Owl Recovery Plan (USFWS 1995c) provides for three levels of habitat management: protected areas, restricted areas, and other forest and woodland types. "Protected habitats" include all known owl sites, and all areas in mixed conifer or pine-oak forests with slopes >40% where timber harvest has not occurred in the past 20 years, and all reserved lands. "Protected Activity Centers" (PACs) are delineated around known Mexican spotted owl sites. A PAC includes a minimum of 600 acres (243 hectares) designed to include the best nesting and roosting habitat in the area. The recommended size for a PAC includes, on average from available data, 75% of the foraging area of an owl. The management guidelines for protected areas from the recovery plan are to take precedence for activities within protected areas. "Restricted habitats" include mixed conifer forest, pine-oak forest, and riparian areas; the recovery plan provides less specific management guidelines for these areas. The Recovery Plan provides no owl specific guidelines for "other habitat."

The range of the Mexican spotted owl in the United States has been divided into six recovery units (RUs) as identified in the Recovery Plan (USFWS 1995c). An additional five recovery units were designated in Mexico. The recovery plan identifies recovery criteria by recovery unit. The Upper Gila Mountain Recovery Unit has the greatest known concentration of owl sites in the United States. This unit is considered a critical nucleus for the owl because of its central location within the owl's range, and presence of over 50 percent of the known owls. The other recovery

units in the United States, listed in decreasing order of known number of owls, are: Basin and Range-East, Basin and Range-West, Colorado Plateau, Southern Rocky Mountain-New Mexico, and Southern Rocky Mountain-Colorado.

From 1991 through 1997, Gutierrez *et al.* (1997, 1998) studied the demographic characteristics of two Mexican spotted owl populations in the Upper Gila Mountains Recovery Unit. The owl populations studied were located on the Coconino and Gila National Forests. Results of this several-year study have shown a decline in the population of Mexican spotted owls within these areas. The reason for the reported decline is unknown. According to Gutierrez *et al.* (1997), such a trend could be a result of: 1) density dependent responses to an increase over carrying capacities; 2) a response to some environmental factor; or 3) senescence. The latter (i.e., senescence) seems unlikely because there was also a negative linear trend in survival estimates for owls less than three years of age. Regarding carrying capacities, responses to density dependence are difficult to prove in the absence of removal or addition experiments.

Environmental factors undoubtedly play a role in owl survival, either through weather events causing direct mortality or indirectly through reduced habitat or prey (Gutierrez *et al.* 1997).

This study found that the ability of adult birds to survive successive years of poor environmental conditions may be low (Gutierrez *et al.* 1998).

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

The goal of this proposed action is to decrease noise in the project area. This portion of the project is a measure toward substantial restoration of natural quiet, where at least 50% of Grand Canyon National Park experiences noise associated with air tours during less than 25% of 12 hours of daylight. Noise generated by aircraft from commercial air tours create a specific issue from flying repeatedly over the same routes at low altitudes. The number of daily flights that would be flown between 300 ft (91.4 m) AGL (minimum aircraft operating altitude permitted) and 1,000 ft (304.8 m) AGL would remain at current levels. Aircraft will be less than 1,000 feet above the ground only over the rims of the canyon. Below the rims, aircraft will be greater than 1,000 feet AGL.

California condor

The release of California condors in Arizona in 1996 was a joint project of The Peregrine Fund, the U.S. Fish and Wildlife Service, the Bureau of Land Management, and the Arizona Game and Fish Department. The release site, Vermilion Cliffs in Coconino County, is on Federal land managed by the Bureau of Land Management. The area is about 30 miles (48.3 km) north of Grand Canyon National Park. California condors in Arizona were given the Endangered Species Act's "non-essential, experimental population" designation, in order to facilitate efforts by the

Fish and Wildlife Service and other Federal, state, and private organizations to return the condors to the wild.

Free-flying condors in Arizona are all in the Grand Canyon vicinity. One condor released in northern Arizona was found dead at the base of the Vermilion Cliffs on January 10, 1997. On November 8, 1999, nine California condors were transported to a release aviary on public lands on the Hurricane Cliffs north of the Grand Canyon. All nine condors hatched at The Peregrine Fund's World Center for Birds of Prey and the San Diego Wild Animal Park. Eight hatched in 1999 and one hatched in 1995. Six of the nine birds were released in early December, with one mortality this month, bringing the total to 25 birds in the wild in Arizona. All condors depend on supplemental feeding stations with livestock carcasses.

All of the Arizona birds are fitted with radios allowing field biologists to monitor their movements. Flights this year took the Arizona condors west to the Virgin Mountains near Mesquite, Nevada, south to the San Francisco peaks outside of Flagstaff Arizona, north to Zion and Bryce Canyon National Parks and beyond to Minersville, Utah and east to Mesa Verde, Colorado and the Four Corners region. Condors will take an occasional 30-mile (48.2 km) "commute" from the Vermillion Cliffs area to the Colorado River (Notes from the Field, 1999). Monitoring data also allows field biologists to notify airport officials of condor activities within tour flight paths, to minimize the risk of collisions (R.V. Ward, NPS. pers. comm.).

Bald eagle

Use of the Grand Canyon vicinity by bald eagles is variable. In the early 1990's, the Colorado River corridor was an important winter concentration area for the bald eagle. Prior to 1984, Floyd Thompson (Service, retired) reported locating three possible bald eagle nests in the Grand Canyon region (Hunt et al. 1992). However, whether some of the wintering bald eagles in the Grand Canyon are part of the southwestern breeding population or all migrate from northern latitudes is not known.

Bald eagles were not recorded in concentrations in the Grand Canyon until after the establishment of the mainstem rainbow trout (*Oncorhynchus mykiss*) fishery following construction of Glen Canyon Dam. Wintering bald eagles were first documented (n=4) in the winter of 1985-1986 (Brown et al. 1989), and observations increased to a high of 26 birds counted in a single day at Nankoweap Creek in late February 1990 (National Park Service 1992). Bald eagle use of the river corridor is opportunistic and currently concentrated around Nankoweap Creek (RM 52) where the birds utilize an abundant food source in the form of winter-spawning trout (Brown and Leibfried 1990; Brown and Stevens 1992; National Park Service 1992).

Some 70-100 bald eagles may have moved through the Grand Canyon in February and March of 1990 (Brown and Leibfried 1990; National Park Service 1992). Daily operations of Glen Canyon Dam influence the migration patterns of spawning trout and availability of this food resource to

bald eagles. For example, during a 1996 survey there was a physical barrier at the mouth of Nankoweap Creek that prevented trout from ascending the creek when river discharge was below

approximately 4,000 cfs (113 cms) (Bill Leibfried, personal communication). At discharges between 4,000 and 15,000 cfs (113 - 424.7 cms), the creek mouth and the lower 98.4 ft (30 m) of the creek were used most frequently by foraging eagles.

Mexican spotted owl

MSOs in this area are included in the Colorado Plateau Recovery Area. This area is dominated by high plateaus dissecting deep canyons. Upper elevations are dominated by woodlands and forest, while the lower elevations are dominated by grasslands and shrub-steppes (USFWS 1995c). Throughout northern Arizona, owls generally foraged slightly more than expected in unlogged forests, and less so in selectively logged forests (Ganey and Balda 1994). However, patterns of habitat use varied between study areas and individual birds, making generalizations difficult. Habitat is naturally fragmented with most owls found in disjunct canyon systems or on isolated mountain ranges. Surveys in 1999 indicated the presence of MSO in rugged canyonland terrain. Some 14 areas have been documented with MSOs (NPS 1999). Protected Activity Centers (PACs) have not been designated in Grand Canyon National Park and much of the suitable habitat is unsurveyed. There is no reliable estimate on the amount of total suitable MSO habitat in Grand Canyon National Park (R.V. Ward, NPS, pers. comm.). In addition to the canyonland habitats, and a large amount of unsurveyed nest/roost habitat, all mixed conifer forests on both North and South Rims may be suitable for MSOs.

Recreation ranks first among human uses in this MSO habitat. Hiking and camping is probably limited in some of the more rugged sites. In addition, hunting, logging, firewood gathering, fire management, and other activities probably occur of Park lands.

Overflight routes cross numerous known owl locations within the Canyon. The Park Service indicates that very few surveys for the spotted owl have been conducted to date. A habitat modeling effort has identified areas of potential nesting habitat based on vegetation type and the presence of cool canyons; preliminary results of the modeling indicate nearly 12,140 ha (30,000 acres) of canyon nesting/roosting habitat, approximately 4,653.9 ha (11,500 acres) of steep forest habitat, and approximately 33,589 ha (83,000 acres) of protected forest habitat (Dan Spotsksy, NPS, pers. comm.). The specific amount of potential nest/roost habitat under each of the twelve overflight routes is currently unknown. No information about the amount of surveyed and unsurveyed habitat within the Canyon or under the overflight routes was provided.

EFFECTS OF THE ACTION

Given the number of flights in the area, most wildlife species have likely become accustomed to the regular noise patterns, although perhaps in a reduced capacity. The long-term effects of aircraft overflights on wildlife are unclear. Although bird strikes have occurred in Grand

Canyon National Park, they were considered “not significant enough to report to the FAA” (61 FR 54044). The potential for aircraft collision and other effects are addressed below.

California condor

One of the reasons the California condor release site was selected because human activity near the release site is minimal (The Peregrine Fund 1996). The condors use of the South Rim area near the Tusayan Airport suggests that they are not impacted by noise levels, although this has not been documented. When the population was introduced in 1996, the Service did not anticipate conflicts with the air tour industry (61 FR 54044) because of the birds’ natural affinity for remote, wild back country habitats, and their dependence on supplemental feeding stations. The presence of condors in developed areas of the South rim was not anticipated. Yet condors have been observed throughout the Grand Canyon area, even foraging within one mile (1.6 km) of Grand Canyon Airport (NPS 1999). The change in flight corridors will move the flight routes further away from the condor high-use areas on the west, and may lessen any impact. On the east end of the South Rim, the flight routes will remain in their current location with respect to the current condor high use area so that any impacts would remain the same in that area. Pilots can probably avoid most interactions with condors, since the birds are so large and easy to see. However, the potential for collisions still exists.

The goal of the Arizona population of condors is to establish a self-sustaining population of 150 individuals with at least 15 breeding pairs. Whether and when this goal will be accomplished is not known, but continued introductions are planned, and natural reproduction is hoped for. As the population increases and matures, wider ranging foraging patterns, and additional changes in condor behavior should be expected.

Bald eagle

According to a Report to Congress on Effects of Aircraft Overflights on the National Park System (NPS 1994), wildlife responds to low-level aircraft overflights, although the manner in which they do so depends on life-history characteristics of the species, characteristics of the aircraft, flight activities, and a variety of factors such as habitat type and previous exposure to aircraft. The primary concerns stemming from these low-level overflights related to wildlife are the physiological and/or behavioral responses caused by the flights. These responses may reduce the wildlife’s fitness or ability to survive. Overflights may cause stress, and if chronic, stress can compromise the general health of the animal (NPS 1994).

Indirect effects, such as accidental injury, energy loss, habitat avoidance and nest abandonment are very difficult to detect, but some experts suspect they occur (NPS 1994). Studies that have investigated the effects of low-level aircraft overflights on birds have determined that such flights disturb raptors (Manci *et al.* 1987). Disturbances include interrupting nesting activities by flushing from nests, displacing birds returning to nests, flushing or displacing birds from foraging areas, provoking interactions with sympatric raptors, and exposing eggs and nestlings to

predators and extreme heat. Studies have also suggested that human activity within breeding and nesting territories may affect raptors by changing home range movements (Anderson *et al.* 1990) and causing nest abandonment (Postovit and Postovit 1987, Porter *et al.* 1973). While these studies have not demonstrated a causal link between low-level overflights and reproductive success, they do document a level of disturbance that maybe equivalent to harassment.

Bald eagles regularly fly to 2,000 ft (610 m) above the surrounding landscape and are likely to use the same air space as aircraft. Their large sizes make them visible and should allow for aircraft to avoid the birds, but still there is a risk of collisions. No nest sites are known for the project area, although there exists a potential for nesting birds to become established. However, impacts to roost sites and potential foraging habitats are probably ongoing, although the significance is not known. Wintering bald eagle concentrations around Nankoweap Creek area will experience fewer aircraft flights, and fewer flight hours in the day, than if eagles were there during the summer months. Noise measurements have been collected in the Nankoweap Creek area. Computer model projections have also been developed for various flight scenarios. The effects of the various noise scenarios on the bald eagle are not known.

Mexican spotted owl

No owl habitat would be physically altered, but the proposed activities could directly affect owls through noise disturbance associated with the continued use of daily overflight routes. The possibility of owl-aircraft strikes is low and not expected to be a problem for this species, because owls are nocturnal and all overflights will occur during daylight hours only. MSOs also remain in the woods and are not soaring birds.

Given the low level that helicopters are permitted to fly over the rims and plateaus, as well as the inability to avoid MSO locations and habitat during the breeding season, the Service is concerned about potential impacts to the owl population in these areas. Noise disturbance caused by overflight activities over and within 1/4 mile (0.4 km) of nest/roost sites during the breeding season (March 1- August 31) could affect breeding through either disrupting the breeding attempt altogether or displacing a nesting female, and thus causing mortality to eggs and chicks. Noise levels will be elevated during overflights, and overflights may be occurring up to 200 times or more per day on the routes, particularly on the South Rim where both owls and potential nesting habitat are known to be present.

Although the spotted owl is primarily nocturnal, disturbance that results from continued and constant low-level overflights could potentially startle roosting and incubating birds. The Service treats unsurveyed or inadequately surveyed habitat as occupied. Existing nest/roost habitat outside of the few areas known to be occupied by spotted owls has the potential to be occupied by owls. Thus, the proposed low-level overflights have the potential to adversely affect owls in the inadequately surveyed areas, particularly when these overflights occur during the breeding season. The results of a study on the effects of helicopter noise on the spotted owl conducted on the Lincoln National Forest in New Mexico (Delaney *et al.* 1999), indicated that

spotted owls did not flush when the noise stimulus was > 344 ft (105 meters) distant. In addition, spotted owls in this study exhibited alert response when helicopters were an average of 1322 ft, +/- 486 ft (403 meters +/-148 meters) away, but showed no response when helicopters were > 2165 ft (660 meters) distant. Delaney *et al.* (1999) recommended that a 344 ft (105 meter) hemispherical protection zone for helicopter overflights would minimize spotted owl flush response. The authors of this study also recommended separating overflights along the same route by at least seven days. Although their sample size was small, Delaney *et al.* (1999) suspected that MSOs become habituated to successive noise exposures.

Results of this study, while not fully applicable to multiple overflights of helicopters and fixed-wing aircraft in the rocky canyon habitat of the Grand Canyon, do provide some useful information about owl responses to helicopter overflights. Of particular concern to the Service is that helicopter overflights will be less than 300 ft (91.4 m) in height over known and potential spotted owl locations when Delaney *et al.* (1999) found flush responses at distances of less than 344 ft (105 meters). Fixed-wing overflights, limited to above 400 feet (121.9 m) AGL will likely result in less flushing of owls; however, alert responses are still likely. Alert responses were observed by Delaney *et al.* (1999) at distances of over 1,300 ft (396.2 m). Multiple overflights conducted at rates of over 100 per day at heights of between 300 and 400 ft (91.4-121.9 m) may have a cumulative impact. Therefore, the Service believes both helicopter and fixed-wing aircraft overflights may adversely affect spotted owls in areas within the Special Flight Rules Area where flights occur at low altitudes over spotted owl habitat.

Displacing spotted owls from nesting and roosting areas leaves eggs, nestlings, and adults vulnerable to diurnal predators. This type of disturbance over the long-term could cause suppressed reproductive success, abandonment of the areas under flight routes after initiation of reproductive behavior, and/or reduction or abandonment of occupancy of habitat under flight routes. Information on whether the noise associated with overflights would be amplified and repeated through echos from the steep canyons common in the Grand Canyon vicinity is not known.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Since much of the project area occurs within the jurisdiction of the National Park Service, it is not likely future actions that might affect listed species within the project area would not be considered a Federal action. Continued developments of the South Rim, including a light rail transit system, are considered future Federal actions and are subject to additional section 7 consultation, and therefore, not included in this consultation. Actions by private individuals on Indian land may or may not be considered Federal actions, such as the construction of helicopter

landing sites. The Service is not aware of any proposed non-Federal action that may affect species or critical habitats considered in this consultation.

CONCLUSION

After reviewing the current status of the affected species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action as proposed, is not likely to jeopardize the continued existence of the California condor, bald eagle, or Mexican spotted owl. No critical habitat has been designated for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agencies so that they become binding conditions of any grant or permit issued, as appropriate, in order for the exemption in section 7(o)(2) to apply. The National Park Service and FAA have a continuing duty to regulate the activity covered by this incidental take statement. If the Park Service or FAA (1) fails to require adherence to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

AMOUNT OR EXTENT OF TAKE

California condor

Although documenting the impacts of noise on the condor will be difficult, the Service anticipates that an unquantifiable number individuals will be affected by this project. Take from the proposed action is expected in the form of harassment or accidental displacement when

startled individuals are flushed from a perch site by the proposed low-level flights. Additional take in the form of kill, estimated at one bird in five years, is anticipated from collisions.

Bald eagle

The Service anticipates unquantifiable incidental take will be in the form of harassment due to disturbance, flushing, or displacement of eagles. Additional take in the form of kill, estimated at one bird in five years, is anticipated from collisions.

Mexican spotted owl

The Service anticipates the disturbance of Mexican spotted owls due to overflights as proposed. The amount of take is unquantifiable, but is expected to be in the form of harassment. The rugged terrain of the Canyon itself as well as the north and south forested rims has limited the amount of surveys to verify presence of the owl, however, modeling information provided by the Park Service indicates the presence of owls as well as a significant amount unsurveyed potential habitat present under the overflight routes.

If, during the course of the action, the amount or extent of the incidental take anticipated is exceeded, the FAA or NPS must reinitiate consultation with the Service immediately to avoid violation of section 9. Operations must be stopped in the interim period between the initiation and completion of the new consultation if it is determined that the impact of the additional taking will cause an irreversible and adverse impact on the species, as required by 50 CFR 402.14(i). An explanation of the causes of the taking should be provided to the Service.

As a surrogate measure of take, the Service will consider incidental take to be exceeded if FAA or NPS does not implement the following reasonable and prudent measures and terms and conditions.

EFFECT OF TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the California condor, bald eagle, or Mexican spotted owl.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the California condor, bald eagle, and Mexican spotted owl.

1. The FAA and the NPS shall develop and implement a management plan for the three listed bird species to evaluate impacts to and incorporate into implementation of Special Flight Rules, or administrative procedures, as appropriate.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of ESA, FAA and the NPS must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

Within one year of the date of this biological opinion, provide the Service with a Draft Management Plan to include, at a minimum, the issues addressed below. The final Management Plan should be implemented within one year of issuing the draft.

1. The FAA, in cooperation with the NPS, shall develop and implement a monitoring program acceptable to the FWS to assess the effects of the implemented action, and related actions, on the three listed bird species. The FAA and the NPS shall update the FWS on the results of the monitoring program no less than annually.
2. The FAA, in cooperation with the NPS, shall conduct an education/awareness program with the air tour operators to develop and implement measures to identify and avoid collisions with and other types of impacts on the listed species. Information on bird strikes shall be reported.
3. The FAA, in cooperation with the NPS, shall develop and implement bird avoidance measures (e.g., alarms or other scaring techniques) to minimize condor use of the airport vicinity.
4. Except in an emergency or as otherwise necessary for the safety of flight, the FAA and the NPS shall evaluate the feasibility of:
 - a. avoiding known bald eagle wintering roosts by 1,000 ft (304.8 m) AGL during the period 1 November - 1 March.
 - b. avoiding any bald eagle nest sites that may become established by 2,000 ft (609.6 m) AGL during the period 1 November - 1 March.
 6. avoiding known Mexican spotted owl protected activity centers (PAC) by at 2,900 ft (883.9 m) laterally (which is equivalent to 600 acres or 242.8 ha) and both PACs and unsurveyed/inadequately surveyed habitat by at least 1600 ft (487.7 m) AGL during the breeding season (1 March through 31 August).

Review Requirements:

The RPMs with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. Because of the difficulty in detecting or measuring take from harassment, a minimized level of incidental take for the California condor, bald eagle, or Mexican spotted owl cannot be identified.

Reporting Requirements:

If a dead, injured, or sick individual of a listed species is found in the action area, initial notification must be made to Service Law Enforcement, Federal Building, Room 105, 26 North

McDonald, Mesa, Arizona, 85201 (Telephone: 602/835-8289) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the finding, a photograph of the animal, and any other pertinent information. The notification shall be sent to Law Enforcement with a copy to the Arizona Ecological Services Field Office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. If possible, the remains shall be placed with educational or research institutions holding appropriate State and Federal permits. If such institutions are not available, the information noted above shall be obtained and the carcass left in place. Arrangements regarding proper disposition of potential museum specimens shall be made with the institution prior to implementation of the action. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should any treated animals survive, the Service shall be contacted regarding the final disposition of the animals.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed or sensitive species or critical habitat, to help implement recovery plans, or to develop information.

1. Maintain a database of potential and existing nesting sites of Mexican spotted owls.
2. Document occurrence of northern goshawk in the project area.
3. Develop a comprehensive research and monitoring plan that evaluates impacts of overflights on other migratory birds, bighorn sheep, or other species that might be affected by this action.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the proposed revisions to flight rules in the vicinity of Grand Canyon National Park, as specified in the Federal Register on July 9, 1999 (64 FR 37295-37301 and 64 FR 37303-37324). As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical

habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If we can be of further assistance, please contact Debra Bills (x239) or Tom Gatz (x240).

/s/ David L. Harlow

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (GARD-AZ/NM)
Federal Aviation Administration, Washington, D.C.

Director, Arizona Game and Fish Department, Phoenix, AZ
Field Supervisor, Fish and Wildlife Service, Ventura, CA
Director, Bureau of Indian Affairs, Phoenix AZ (Attn: A. Heuslein)
Superintendent, Grand Canyon National Park, Grand Canyon, AZ
Superintendent, Glen Canyon National Recreation Area, Page, AZ
Director, Cultural Preservation Office, Hopi Tribe, Kykotsmovi AZ
Director, Department of Natural Resources, Hualapai Tribe, Peach Springs AZ
Director, Navajo Nation Historic Preservation Dept., Navajo Nation, Window Rock AZ
San Juan Southern Paiute Tribe, Tuba City AZ
Southern Paiute Consortium, Pipe Spring AZ
Pueblo of Zuni, Zuni, New Mexico

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