

SUMMARY
BIOLOGICAL OPINION ON THE EFFECTS TO THE BALD EAGLE FROM THE
OPERATIONS OF ALAMO DAM AND ALAMO LAKE

Date of the opinion: February 15, 1996

2-21-94-F-305

Action Agency: Corps of Engineers

Project: The project included in this biological opinion was the operation of Alamo Dam and Alamo Lake.

Listed species affected: Threatened Bald eagle (*Haliaeetus leucocephalus*)

Biological opinion: Non-jeopardy for the bald eagle.

Incidental take statement: The operation of Alamo Dam has resulted in the incidental take of bald eagle and the Service anticipates that additional take may occur again in the future. The Service retroactively permits the take of two bald eagle eggs and the take of two fledglings. An additional take of four eggs or four nestlings is anticipated to cover rescue operations during future flood events. Destruction of four bald eagle nests was permitted for the flood event of 1993. The destruction of one bald eagle nest was permitted for the flood events of February and March 1995. The destruction of an additional two nests is anticipated from future flood events.

Reasonable and prudent measures (RPMs): Three RPMs were provided to minimize incidental take as follows: 1) reduction of the likelihood of drowning nestlings and/or eggs; 2) reduction of the likelihood of occupied bald eagle nest inundation, and; 3) reduction of the possibility of harassment of nesting bald eagles by the public.

Terms and conditions: Implementation of the RPMs. Terms and conditions are mandatory requirements. Terms and conditions include funding in support of the Arizona Bald Eagle Nestwatch Program, notification of the Service and the Arizona Game and Fish Department whenever inundation of active bald eagle nests at Alamo Lake is possible, logistical assistance during rescue operations, logistical assistance for any foster operations, maintenance of lake levels at approximately 1120 feet elevation, notification to the Arizona Game and Fish Department of displaced buoys which identify a buffer zone around occupied nests, and assistance in replacement of buoys.

Conservation recommendations: Implementation of conservation recommendations is discretionary. Five conservation recommendations are provided.



United States Department of the Interior
Fish and Wildlife Service

Arizona Ecological Services Field Office
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Phoenix, Arizona 85021-4951
(602) 640-2720 Fax (602) 640-2730



In Reply Refer To:

AESO/SE
2-21-94-F-305

February 15, 1996

Mr. Carl F. Enson, P.E.
Chief, Construction-Operations Branch
Department of the Army
Los Angeles District, Corps of Engineers
P.O. Box 2711
Los Angeles, California 90053-2325

Dear Mr. Enson:

The U.S. Fish and Wildlife Service has reviewed the biological report prepared for the operation of Alamo Dam in Mojave and Yuma counties, Arizona. Your April 6, 1994, request for consultation was received on April 11, 1994. This document represents the Service's biological opinion on the effects of the proposed action on bald eagle (*Haliaeetus leucocephalus*) in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. 1531 *et seq.*).

This biological opinion is based on information provided in the biological report dated April 6, 1994, the Proposed Water Management Plan for Alamo Lake and the Bill Williams River (Water Management Plan) (AGFD 1994), other letters and documents exchanged between the U.S. Army Corps of Engineers and the Service, discussions and field meetings between the Corps and the Service, discussions and field meetings with interested agencies, data in our files or in the published or grey literature, and other sources of information. The literature cited in this biological opinion does not represent a complete bibliography of literature on the bald eagle or the effects of dam operations on this species that may have been considered in the development of this biological opinion. A complete administrative record of this consultation is on file in the Service's Arizona Ecological Services Office.

This biological opinion does not address other endangered species within the proposed project area including southwestern willow flycatcher (*Empidonax traillii extimus*) or Yuma clapper rail (*Rallus longirostris yumanensis*). This opinion was intended to address past actions and effects to the bald eagle as well as effects to the bald eagle through 1998.

CONSULTATION HISTORY

The 90-day consultation period began on April 11, 1994, the date your request was received by the Arizona Ecological Service Field Office. Notice of that receipt was sent to you in a memorandum dated April 14, 1994. A draft biological opinion was provided to the Corps on March 9, 1995. A description of the consultation process for this project is described in greater detail in the Past Action and Project History section below.

BIOLOGICAL OPINION

It is the Service's biological opinion that the action as proposed will not jeopardize the continued existence of the bald eagle.

DESCRIPTION OF THE PROPOSED ACTION

Past Action and Project History

In early January 1993, extended heavy rains fell in the Bill Williams River watershed in west-central Arizona. The consequent runoff resulted in the rapid filling of Alamo Lake to near record levels. On January 8, 1993, Corps personnel notified the Arizona Game and Fish Department of the current lake level and rate of rise of the lake. This information indicated imminent inundation of bald eagle nests in dead cottonwood trees located in upper (eastern) Alamo Lake. Biologists from the Service and AGFD immediately conducted a rescue operation, with assistance from Alamo Lake State Park staff. Two eggs were removed from the active nest in the Alamo Breeding Area (BA) nest at dusk, when the nest was approximately seven feet above the lake surface. This nest and three other unoccupied bald eagle nests on upper Alamo Lake were all inundated the next day. All nests were destroyed, and apparently one of the nest trees also fell or floated away. Nests were approximately 60 to 70 feet below the surface of the reservoir in February of 1993 (Hunt *et al.* 1992).

The salvaged eggs were taken to the Phoenix Zoo for incubation and rearing. One egg proved nonviable, while the other was hatched and hand-reared to an age at which it could be placed in a suitable foster nest. In the interim, the Alamo BA eagles constructed a new nest on a rock outcrop north of the lake and laid an additional egg. On March 9, 1993, biologists from the Phoenix Zoo, AGFD, and the Service placed the eaglet hatched at the zoo in the Ives BA nest below Alamo Dam with assistance from KTSP TV-10, Bureau of Land Management, Alamo Lake State Park, and Corps personnel. The eaglet fledged approximately eight weeks later.

Throughout the spring of 1993, the Service and Corps occasionally discussed the need for emergency section 7 consultation to take place for the events of that year. Further, it was recognized that "take" of bald eagle nests, eggs, and eaglets is likely to occur in the future due to similar flood events, and that consultation to cover such events should also take place. These issues were summarized in a letter from the Service to the Corps dated August 13, 1993. On

February 25, 1994, the Corps notified the Service that the Corps anticipated initiating consultation soon. On April 11, 1994, the Service received the Corps' biological report (Corps 1994) and request for formal consultation. Due to workload and changes in personnel at the Arizona Ecological Services Office, this biological opinion was not completed in a timely manner.

Another flood event occurred February 15, 1995, requiring the rescue of two ten-day-old eaglets from the Alamo bald eagle nest when the water level was six inches up the base of the nest. The adult eagles continued to incubate chicken eggs that were placed in the nest when the eaglets were removed. After three days of incubating chicken eggs the adults appeared to have abandoned the nest. Early on the fourth day, the water elevation had dropped, and Greg Beatty of the AGFD decided to attempt reintroducing the eaglets to their nest. The reintroduction was considered successful when the adults were observed feeding the eaglets. On February 22, 1995, the Service sent a letter to the Corps suggesting that the lake level be brought down to 1117-foot level in order to avoid further "harassment" of the eagles by recreationists.

Discussions with Carvel Bass of the Corps on March 6, 1995, led the Service to believe that the recommendations in our February 22, 1995, letter were not being implemented. The Corps has been operating under the proposed Water Management Plan for Alamo Lake and the Bill Williams River, which is neither an action or decision document and has not yet undergone section 7 consultation. The plan calls for a target reservoir elevation level of 1125 feet. This level had been agreed to by the Service when it was believed that the eagles had permanently moved to a rock outcrop north of the lake after the 1993 floods. Because the cottonwood snags were not expected to maintain their integrity after being flooded for prolonged periods of time, no contingency plan was developed by the Corps or the Service for those years when the bald eagles may choose to use the snags as nesting structures.

On March 7, 1995, the Service received an emergency call from Greg Beatty of the AGFD who anticipated another rescue operation due to recent rains. However, reservoir releases were of sufficient magnitude to prevent inundation of the nest for this event and the lake elevation only rose to 1130 feet (six feet from the base of the nest). Consequently, a second removal of the eaglets from their nest was not required. After the March 7 flood event, the lake level was maintained just below 1120 feet.

Proposed Action

This consultation provides an analysis of effects for past flood events in 1993 and 1995, as well as for future operations of the reservoir by the Corps through 1998. The Corps proposes to continue dam operations under the Flood Control Act of 1944, and Alamo Lake Regulation Manual of 1970, as revised. Operation of the dam under these authorities will periodically result in filling Alamo Lake to levels comparable to those of 1993 and 1995. Rainfall events of the sustained intensity and wide geographic scope necessary to cause such runoff usually occur during the winter rainy season, which corresponds with the nesting season of the southwestern bald eagle.

DESCRIPTION OF THE PROPOSED ACTION AREA

Alamo Dam creates Alamo Lake, just downstream from the confluence of the Big Sandy and Santa Maria rivers in west-central Arizona. The Bill Williams River is formed by the confluence of the Big Sandy and Santa Maria rivers, and continues downstream from Alamo Dam. Uplands in the area are vegetated in Sonoran Desertscrub, Arizona Uplands Subdivision, with some characteristics of the Lower Colorado Subdivision (Brown 1982). The Big Sandy, Santa Maria, and Bill Williams rivers in the project area are nearly perennial streams; however, midsummer flows are often subsurface. The three rivers support thickets and forests of riparian vegetation, including willow (*Salix* sp.), cottonwood (*Populus* sp.), and tamarisk (*Tamarix* sp.), with some marshy areas. Alamo Lake and the three rivers provide the only large surface water in west-central Arizona. River substrate is primarily sand above Alamo Lake, and cobble, gravel, and sand below Alamo Dam. Alamo Lake supports little riparian vegetation, except at the inflow area. There, sediment deposition and a high water table allow establishment of extensive thickets of tamarisk and some willows. These are periodically inundated by runoff events similar to the January 1993 event. Extensive mortality of tamarisk and willows results from this type of inundation, but extensive regeneration also occurs subsequently.

Numerous cottonwood snags also stand in the inflow area. These cottonwoods are within the former floodplain of the Bill Williams River and were killed by inundation following creation of Alamo Lake. Some snags stand over open water and others over exposed ground, depending on the current lake level. Bald eagles construct their nests in these snags and use the snags as foraging perches. The project area supports abundant prey for bald eagles including fish, and wintering waterfowl and shorebirds.

STATUS OF THE SPECIES

The bald eagle is a large raptor once found throughout North America near seacoasts, lakes, and rivers. Bald eagles nest in trees near these bodies of water. The primary food is fish, taken live or as carrion. The bald eagle was first listed as an endangered species on March 11, 1967. Chemical contamination caused chiefly by organochlorine pesticides resulted in reproductive failure and direct toxicity and led to severe population declines and local extirpation throughout the species' range. Habitat loss, persecution, and disturbance also endanger the bald eagle. No critical habitat has been designated for this species.

Although not considered a separate subspecies, bald eagles in the southwestern United States are considered a distinct population for purposes of recovery efforts and section 7 consultation under the Endangered Species Act (USFWS 1982, USFWS 1986). The southwestern bald eagles are also unusual behaviorally in that they frequently nest on cliffs; a phenomenon rare outside this geographic region. The southwestern bald eagle nests early, with eggs laid in January or February. This is believed to be a behavioral adaptation to avoid the extreme desert heat of midsummer. The young eagles remain in the vicinity of the nest until June (Hunt *et al.* 1992).

Two BAs are known in New Mexico (pers. comm., S.O. Williams III, New Mexico Department of Game and Fish), and 36 in Arizona (pers. comm., G.L. Beatty, Arizona Game and Fish Department). In 1995, 30 of the BAs in Arizona were occupied with each BA supporting one nesting pair. The majority of the population within Arizona is distributed along the Salt, Verde, Gila, and Bill Williams rivers, as well as several major tributaries.

Southwestern eagles show a high level of genetic heterozygosity; however, because it could not be demonstrated that Arizona bald eagles are a part of a larger population, Hunt *et al.* (1992) initially concluded that it was prudent to assume reproductive isolation. However, in 1994, a male bald eagle originating in eastern Texas was discovered breeding at Luna Lake in northeastern Arizona. The origin of the unmarked female was undeterminable. It is also suspected that some of the silver-banded birds observed in Arizona in recent years may have immigrated into this population. This new information indicates that the bald eagles of central Arizona are not reproductively isolated, as was previously believed. Although many of the threats to this population persist, the population appears to be stable or increasing. The bald eagle, including the southwestern bald eagle population was downlisted to threatened on August 11, 1995 (USFWS 1995).

ENVIRONMENTAL BASELINE

The environmental baseline defines the current status of the proposed species and its habitat to provide a basis for assessing the effects of the action now under consultation. While it is clearly focused on conditions in the action area, it is important to include in this definition the status of the listed species throughout its range as well as in the action area. Any evaluation of the effects of the action must be made in the context of the overall species' status.

The environmental baseline is developed using past and present impacts of all Federal, State, or private actions and other human activities 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. A summary of status information for the species from outside the action area also forms a part of the environmental baseline.

The Bill Williams River is subject to the effects of Federal, State and private actions. There are both new and long-term ongoing actions in the action area. Impacts of these human activities on Alamo Lake and the Bill Williams River watershed have had profound effects on the river and associated riparian areas. Water diversions and return flows, flood control projects, livestock grazing, feral burro grazing, recreational activities, and changes in annual flows due to off-stream uses of water have affected the distribution, stability, and regeneration of native riparian vegetation. The loss of riparian vegetation due to activities described above has affected the habitat of the bald eagle. Nests in the Alamo BA are usually placed in trees, primarily cottonwood snags killed by inundation at the upper lake inflow area. The riparian area also provides habitat for prey species for the eagles.

Overgrazing by livestock in riparian areas has hindered or eliminated most regeneration of cottonwoods, sycamores, and willows which could be used as perching and nesting substrate by bald eagles. The riparian habitat has been restricted to the upper portion of Alamo Reservoir and the Bill Williams, Big Sandy, and Santa Maria rivers to the north. According to Hunt *et al.* (1992), cattle grazing is no longer permitted in the upper portion of Alamo Reservoir, although trespass cattle are a common sight, and there is still very little regeneration of cottonwoods and willows.

The bald eagle has made substantial progress toward recovery. However, even though the southwestern population appears to be increasing, bald eagles are increasingly exposed to hazards from a regionally expanding human population. These include extensive loss and modification of riparian breeding and foraging habitat through clearing, changes in groundwater levels and hydrographs, and changes in water quality, and increasing human disturbance from urban, rural and recreational encroachment into breeding habitat. This latter threat includes a host of activities documented by Stahlmaster (1987) such as shooting, collision with vehicles, aircraft, transmission lines and structures, poisoning, and electrocution.

The bald eagle population in the Southwest was probably never very large due to limited habitat, and in pre-industrial times likely fluctuated in size in response to weather conditions (e.g. cyclic droughts and wet periods). Following the banning of domestic use of the pesticide DDT in 1972, the Arizona bald eagle population has probably increased despite growing pressures of a regionally increasing human population and associated industrialization. However, while significant recovery has taken place, the bald eagle remains somewhat tenuously established in the Southwest. Various reports and records suggest that nesting bald eagles may have been more widely distributed in Arizona in the past. There are approximately 20 historic site records which strongly suggest the historic presence of bald eagle nest sites not known to have been occupied in the last decade (Hunt *et al.* 1992). These observations may suggest that there are factors that are currently limiting further recovery or population expansion.

Within the State of Arizona, eagle breeding sites face continually increasing threats, especially near population centers, from malicious and accidental harassment, including shooting, off-road vehicles (ORVs), low aircraft overflights, loss of nesting and foraging habitat from riparian degradation, and lethal entanglement in fishline as documented by Hunt *et al.* (1992) and by AGFD (G. Beatty, pers. comm.). Many of Arizona's known BAs are located on rivers and near reservoirs that are easily and frequently accessed by the public. The Arizona Bald Eagle Nestwatch Program (ABENWP) continues to document disturbance at nest sites and frequently intervenes to reduce harassment. This intervention has proven not only effective but perhaps crucial in maintaining the southwestern population. Up to 50 percent of a given year's reproduction has been salvaged by ABENWP "rescue" operations including removal of fishline and tackle from nestlings and the return of nestlings to nests after they have fallen or left in response to disturbance or to escape extreme heat.

The Bill Williams River in the project area supports three BAs. The Ives BA is centered approximately one mile downstream from Alamo Dam. Several nests are located in the cliffs of the Bill Williams River Canyon. Adults are seen foraging on Alamo Lake, especially the upper lake. The Alamo BA is centered on the upper lake, in the Brown's Crossing area. Nests are constructed in the cottonwood snags here, with three or four alternate nests existing simultaneously. In 1993 the Alamo BA eagles for the first time constructed a cliff nest on the north side of Alamo Lake.

In 1985 and 1986, the Chino BA was occupied, centered around nests in a stand of cottonwoods along the Big Sandy River approximately three miles upstream from its confluence with the Santa Maria River. The Chino BA has not been occupied since 1986 (see annual AGFD Nest Survey reports).

The Alamo Lake bald eagle BAs are important in maintaining and recovering the southwestern population. Combined occupancy, success, and total productivity levels at the Alamo and Ives BAs are above the Arizona average. From 1987 to 1994, Alamo and Ives maintained an occupancy rate of 100 percent, a success rate of 87.5 percent, and an average productivity of 1.21 young fledged per BA per year. The overall Arizona population averages, excluding Alamo and Ives, were an occupancy rate of 85.3 percent, a success rate of 47.3 percent, and a productivity of 0.71 young fledged per BA per year.

EFFECTS OF THE ACTION

The operation of Alamo Dam has resulted in both beneficial and negative effects to the threatened bald eagle. Hunt *et al.* (1992) found that reservoir inflows are particularly valuable foraging areas, and in fact most Arizona reservoirs have a BA located at or near the river inflow. Creation of Alamo Lake in conjunction with changes in prey base species is likely to have created bald eagle foraging habitat superior to that historically available along the reaches of the Big Sandy, Santa Maria, and Bill Williams rivers. Prior to reservoir construction, foraging resources were restricted to the relatively low-flow upper Bill Williams River and adjacent uplands, and may have limited the BA's capability for successful reproduction. The creation of Alamo Lake by Alamo Dam, and the productive foraging opportunities it affords by supporting waterfowl and lake fishes may be responsible for the consistent occupancy and reproduction at the Alamo Lake BAs.

Operation of Alamo Dam also has negative effects on bald eagles. Repeated inundation has led to the decline of riparian vegetation at the upper end of the reservoir. In addition, occasional, extreme winter rain events result in inundation of nests by rising lake levels. As in the flood events of 1993 and 1995, these nests may contain eggs or young eagles, which will drown without human intervention. Also, creation of the lake has caused the death of the cottonwood riparian habitats along the Bill Williams River below its origin at the confluence of the Big Sandy and Santa Maria. Most known nests for the Ives and Alamo BAs are located in these cottonwood snags that are continuing to decay and collapse. Cliffs are available for nesting for the Ives BA. Alternative cliff sites are available for the Alamo BA, but many of the possible

nesting sites would leave the nests exposed to predators and extreme heat, and would also require the adults to travel farther to forage. Potential nest trees are also available for Alamo BA, up both the Big Sandy and Santa Maria rivers.

Initial recommendations of the Service were to maintain water elevations at or above 1120 feet. The base of the nest is at 1136 feet. The Service agreed to the elevation of 1125 feet proposed by the Bill Williams River Corridor Technical Committee when it was believed that the eagles had relocated the nest to a cliff that would not be affected by lake levels. Because the eagles subsequently built a nest within a cottonwood snag in the upper end of the lake, the Service now believes that a water elevation of 1120 feet would be more appropriate in providing adequate protection of bald eagles nesting in the area. This elevation would meet the lower end of the elevation range recommended by the Bill Williams Corridor Technical Committee, and as such would provide for management and wildlife needs as identified in the Water Management Plan (AGFD 1994). In addition, it would provide an additional five feet (compared to the 1125 elevation) as a buffer against future winter flooding. During flooding in 1995, it was reported to Greg Beatty of the AGFD by the Corps that the lake was rising nine inches per hour. The additional five feet provided by maintaining the lake level at 1120 feet would therefore provide invaluable response time for removal of eggs or eaglets from the nest when required.

CUMULATIVE EFFECTS

Cumulative effects are those effects of future non-Federal (State, local government, or private) activities on endangered or threatened species or critical habitat that are reasonably certain to occur in the foreseeable future. Future Federal actions are subject to the consultation requirements established in section 7, and therefore are not considered cumulative in the proposed action.

Increases in recreational use of Alamo Lake may result in increased pressures on the local bald eagle population. These recreational uses may include increased fishing and shooting, which in turn increase the risk of fishing tackle in eagle nests and increase incidents of accidental or malicious shooting of bald eagles.

INCIDENTAL TAKE

Sections 4(d) and 9 of the 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 the incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to require the applicant to adhere 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.

The Service anticipates that the operation of Alamo Dam could result in the incidental take of bald eagles. The incidental take is expected to be in the form of harassment and harm due to disruption of normal reproductive behavior and habitat modification due to elevated reservoir levels (i.e. loss of nesting substrate or of the nest itself), and/or death of eggs and/or nestlings due to handling. The Service estimates that from 1993 to 1998 the operation of Alamo Dam did or will result in incidental take of bald eagles as follows:

1. For the flood event of 1993, the Service retroactively permits the take of two bald eagle eggs. For the flood events of February and March 1995, the Service retroactively permits the take of two fledglings. An additional take of four eggs or four nestlings is anticipated to cover rescue operations during future flood events through 1998.
2. Destruction of four bald eagle nests (occupied or unoccupied) is permitted for the flood event of 1993. The destruction of one bald eagle nest is permitted for the flood events of February and March 1995. The destruction of an additional two nests is anticipated from future flood events through 1998.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take documented in this biological opinion:

1. Reduce likelihood of drowning nestlings and/or eggs.
2. Reduce the likelihood of loss of occupied bald eagle nests and nest snags.
3. Reduce the likelihood of harassment of nesting bald eagles by the public.

TERMS AND CONDITIONS

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

1. The following terms and conditions are required to implement reasonable and prudent measure 1:
 - 1.1 Corps personnel stationed at Alamo Lake shall notify the Service and the AGFD whenever inundation of active bald eagle nests (nest containing eggs or nestlings) is possible. Notification shall be given at least 24 hours before possible inundation.
 - 1.2 The Corps shall logistically assist any rescue operations arising out of the contingency described in Term and Condition 1.1 above. This shall include providing access to areas restricted from public use, access for nestwatchers to telephones, and transportation in Corps boats to nest sites, if such boats are present at Alamo Lake.
 - 1.3 The Corps shall logistically assist any foster operations arising out of the contingencies described in Terms and Conditions 1.1 and 1.2 above. If the Service and/or AGFD deem it appropriate to place eggs or young rescued under Term and Condition 1.2 into an Alamo Lake area eagle nest after interim care, the Corps shall provide access to areas restricted from public use, access for nestwatchers to telephones, and transportation in Corps' boats to nest sites, if such boats are present at Alamo Lake.
 - 1.4 Help fund the Arizona Bald Eagle Nestwatch Program through 1998 in order to provide early notification of impending nest inundation so that measures to rescue eggs or chicks from nests can be undertaken in a timely manner. Funding shall be in the amount sufficient to staff three nestwatchers through the breeding season, or approximately \$15,000 annually. In most years, the nest watchers would be stationed at Alamo Lake. However, they will be re-assigned to other BAs within Arizona when appropriate (i.e., following nest failure or confirmation of cliff-nesting) to further the recovery of the population which would further buffer any losses occurring at Alamo Lake. The Corps shall secure a written agreement with the AGFD as the AGFD coordinates the Arizona Bald Eagle Nestwatch Program. The AGFD has assured the Service that they have established procedures through which funding contributions are made.
2. The following terms and condition are required to implement reasonable and prudent measure 2:
 - 2.1 When bald eagles are nesting in snags on the lake, maintain the lake elevation no higher than 1120 feet from December 1 - July 15 unless weather conditions and operating constraints of the dam render the 1120 foot elevation unattainable. This will help lengthen the integrity of the nest structure as well as allow additional response time for egg or nestling rescue during flood

events.

It should be noted that implementation of term and condition 2.1 will not be required when bald eagles are nesting at the cliff nest, provided that on-going monitoring documents nesting at the cliff nest.

2.2 Help fund the Arizona Bald Eagle Nestwatch Program through 1998, (as stated in Term and Condition 1.4) to determine if bald eagles are nesting at the snag nest at any time during the breeding season. Information gained through monitoring will determine whether implementation of term and condition 2.1 is required.

2.3 Develop a drawdown plan for releasing stored water following major floods in order to alleviate threats to snag nesting bald eagles. Development of the plan must consider removal of immediate and future flooding threats to the eagles as well as operational constraints of the dam, and will require that the Corps coordinate with appropriate personnel from the Service and the AGFD.

3. The following terms and conditions are required to implement reasonable and prudent measure 3:

3.1 Notify the AGFD within 24 hours whenever buoys surrounding an occupied nest are displaced by flooding or other means and assist the AGFD in replacing the buoys. Corps assistance should include providing access to areas restricted from public use, access for nestwatchers to telephones, and transportation in Corps boats to nest sites, if such boats are present at Alamo Lake.

3.2 Help fund the Arizona Bald Eagle Nestwatch Program each year through 1998 (as stated in Term and Condition 1.4). This will ensure that nestwatchers will be present at Alamo Lake to minimize harassment of the bald eagles by recreationists whenever lake levels permit access to snag nests. Funding of the nest watch program will occur as specified under 1.4, so that implementation of 3.2 will not require an additional expenditure by the Corps.

REPORTING REQUIREMENTS

If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the nearest Service Law Enforcement Office at 602/379-6443 or

the Arizona Ecological Services Field Office at 602/640-2720. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the 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 species or critical habitat, to help implement recovery plans, or to develop information. The Service has developed the following conservation recommendations:

1. During the next revision of the Alamo Dam and Water Control Plan and the manual, include a contingency plan for rescue operations when eagles are nesting on the snags in Alamo Lake.
2. Construct an alternative nest structure at a higher elevation but in close proximity to the existing snag. The snag should be constructed outside of the bald eagle breeding season and coordinated with the Service and the AGFD.
3. Where land ownership allows, or where private landowners are willing, plant cottonwood and willow poles in those areas with suitable soil conditions and moisture regimes to enhance recovery of riparian habitat along the Bill Williams River downstream of Alamo Dam.
4. Produce a pamphlet for distribution to the interested public on the values of riparian habitat and management efforts at Alamo Dam.

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 - CONCLUSION STATEMENT

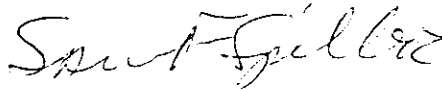
This concludes formal consultation on operations of Alamo Dam and Alamo Lake, as described in your request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by 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 a 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 agency action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

This biological opinion provides an analysis of effects of Corps operations through 1998. The Corps will need to reinitiate consultation at that time whether or not the Water Management Plan or another plan of operation has been adopted in order to ensure compliance with section 7 of the ESA.

In future communications on this project, please refer to consultation number 2-21-94-F-305. If we may be of assistance, please contact Mary Richardson, Bruce Palmer, or Tom Gatz.

Sincerely,

A handwritten signature in cursive script that reads "Sam F. Spiller".

Sam F. Spiller
Field Supervisor

cc: Chief, Fish and Wildlife Service, Arlington, VA (DES)
Regional Director, Fish and Wildlife Service, Albuquerque, NM (GM:GSV/LCR)

Director, Arizona Game and Fish Department, Phoenix, AZ

LITERATURE CITED

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