



United States Department of the Interior
Fish and Wildlife Service

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In Reply Refer To:
AESO/SE
2-21-96-F-335

July 22, 1996

Ms. Cindy Lester
Arizona-Nevada Area Office
Regulatory Branch
U.S. Army Corps of Engineers
3636 N. Central Avenue, Suite 760
Phoenix, Arizona 85012-1936

Dear Ms. Lester:

This biological opinion responds to your request of June 24, 1996, for formal consultation pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended, on the proposed repair of the spillway of the Phelps-Dodge Eagle Creek Diversion Dam in Greenlee County, Arizona. The species of concern are endangered razorback sucker (*Xyrauchen texanus*) and threatened spikedace (*Meda fulgida*). No designated critical habitat exists in the project area. The 135-day consultation period began on June 24, 1996, the date your request was received in our office.

The Fish and Wildlife Service concurs with your finding of no effect to the endangered southwestern willow flycatcher (*Empidonax traillii extimus*), cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), bald eagle (*Haliaeetus leucocephalus*), and threatened Mexican spotted owl (*Strix occidentalis lucida*). Existing and potential habitat at the construction site appears to be unsuitable for the southwestern willow flycatcher. Although historical records for cactus ferruginous pygmy-owls exist from the project area, the information provided indicates unsuitable habitat at the construction site. Although bald eagles use the area in winter, they would not be present during the construction period. The Mexican spotted owl would be at higher locations during the proposed summer time period proposed for the project. We concur with a finding of no effect for peregrine falcon (*Falco peregrinus*) conditional on the proposed work not being conducted between March 1 and July 15. The area is unsurveyed and contains potential habitat for this species. Noise associated with the project might adversely affect peregrine falcon if conducted during the nesting season.

We believe the project may affect, but is not likely to adversely affect the threatened loach minnow (*Tiaroga cobitis*) due to the extremely low probability of loach minnow occurring in the scour pool at the project site. However, for future reference, the information in the biological evaluation is in error regarding records of loach minnow from Eagle Creek. The 1950 record of loach minnow from Eagle Creek, which was at one time thought to be an error, has been

confirmed by the location of specimens for that record at the University of Michigan. Although this is alluded to in Marsh *et al.* 1990, the confirming records are the museum specimens.

The following biological opinion is based on information provided in the March 1996 *Biological Assessment for Proposed Repairs to the Lower Eagle Creek Diversion Dam* (BA); telephone calls between Phelps Dodge, Corps and Fish and Wildlife Service staff, data in our files 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 or other subjects considered in this opinion. A complete administrative record of this consultation is on file in the Arizona Ecological Services Office in Phoenix.

CONSULTATION HISTORY

On April 18, 1996, the Corps requested a concurrence with a finding of "no effect" for all of the listed species mentioned above. Telephone calls between this office, your office, and Phelps Dodge discussed the possibility of take of listed species in the scour pool during pumping and the Service's recommendation for formal consultation to provide a permit for any incidental take that might occur as a result. To expedite matters, the Service did not formally reply to your April 18 letter with a nonconcurrence, but rather recommended, via telephone, on June 21, 1996 that formal consultation be initiated. Formal consultation was initiated on June 24, 1996, by letter from your office.

Effects to listed species from the diversion dam itself have not been analyzed through section 7 consultation. Although the dam was originally constructed in 1897, it has been substantially rebuilt several times (Marsh *et al.* 1990). The last reconstruction reportedly occurred following flooding in 1993. The dam has substantial effects, some adverse and some beneficial on the native fish fauna of Eagle Creek. Although the dam predates the listing of spikedace and razorback sucker and the enactment of the Clean Water and Endangered Species Acts, we assume dam reconstruction is subject to 404 permit requirements and the resulting section 7 consultation requirements. We recommend the Corps enter consultation on past and future effects of the dam and periodic repair and reconstruction needs.

BIOLOGICAL OPINION

Description of the Proposed Action

The proposed project is to repair erosion damage to the spillway of the existing Phelps Dodge water diversion dam on lower Eagle Creek. The dam is located in T.4S., R.28E., NW1/4 section 23 (Figure 1). The purpose of the dam is to provide water for the Phelps Dodge copper

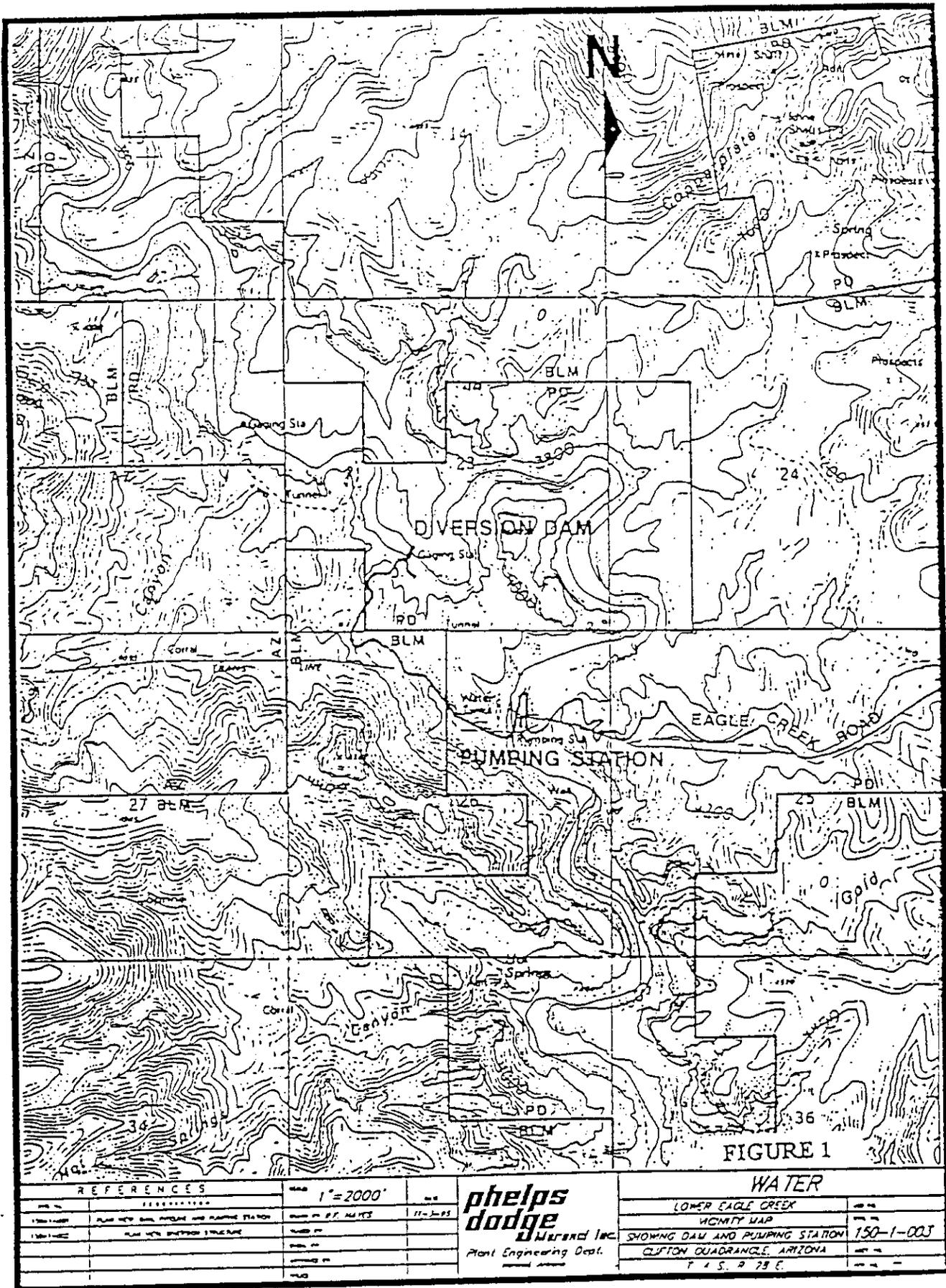


FIGURE 1

| | | | | | | |
|------------|--|------|---|-----------------------------|---------------------------------|-----------|
| REFERENCES | | | phelps dodge WERNER INC. Plant Engineering Dept. Phoenix, Arizona | WATER | | |
| 150-1-003 | PLAN FOR DAM, INTAKE AND PUMPING STATION | DATE | | 11-2-93 | LOWER EAGLE CREEK | |
| 150-1-002 | PLAN FOR DIVERSION STRUCTURE | DATE | | | CONTOUR MAP | |
| | | DATE | | | SHOWING DAM AND PUMPING STATION | 150-1-003 |
| | | DATE | | CLIFTON QUADRANGLE, ARIZONA | | |
| | | DATE | | T. 4 S. R. 28 E. | | |

Figure 1. General location of the project area.

mines and for municipal use at Morenci and Clifton. The pumping station that pumps water uphill to Morenci is located about 2.5 stream miles downstream from the diversion dam.

The dam is a concrete structure approximately 16 feet tall and 135 feet wide (cross-channel). It has an existing concrete apron which extends about 60 feet downstream from the dam with concrete energy dissipators on the apron and sheet piling about 20 feet tall embedded vertically in the substrate below the apron (Figure 2). At the downstream end of the existing apron, a scour hole approximately 140 feet long, 180 feet wide, and 10 feet deep was eroded in the winter 1994-95.

The proposed project would involve pumping the water from the scour hole and partially filling it with concrete to form an abutment at the toe of the existing spillway apron. The abutment would be about 260 feet wide (cross-channel) and extend about 40 feet downstream from the existing apron with a slope of 3:1. The remaining portion of the scour pool would be left as it is.

Approximately 1200 yards of concrete would be used and it would be produced on site using a portable concrete batch plant. The batch plant would be set up downstream from the dam on the stream bank in a previously disturbed area. Aggregate material for the concrete would be brought from an off-site upland location over existing access roads.

Water pumped from the scour pool would be used for dust control on nearby unpaved roads. An excess water would be pumped into the creek downstream from the dam. Fish and other aquatic vertebrates would be captured during pumping, using nets. Intake into the pumps would be screened. Captured fish would be released downstream into appropriate habitats.

Species Description and Status - Razorback sucker

The razorback sucker was listed as endangered on October 23, 1991 (USFWS, 1991). Critical habitat was designated for razorback sucker on March 21, 1994 (USFWS, 1994a). Within the Gila River basin, critical habitat includes portions of the Gila, Verde, and Salt Rivers, but does not include Eagle Creek. Critical habitat includes the river and its 100-year floodplain. Razorback sucker grows to over two feet in length and has a distinctive abrupt, sharp-edged dorsal ridge behind the head (Minckley, 1973). It was once common throughout the Colorado River basin. The species now exists sporadically only in about 750 miles of the upper basin (Bestgen, 1990). In the lower basin a substantial population exists only in Lake Mohave, but razorback sucker do occur upstream in Lake Mead and Grand Canyon and downstream sporadically on the mainstem and associated impoundments and canals (USFWS, 1991). Habitat alteration and destruction along with competition and predation from introduced nonnative fish species are responsible for the species' decline (Marsh and Brooks, 1989; Minckley *et al.*, 1991). As part of the recovery program, razorback sucker has been stocked into numerous locations in the Gila, Salt, and Verde River basins, including Eagle Creek (Creef *et al.*, 1992; Hendrickson, 1993).

Adult razorback sucker inhabit a wide variety of riverine habitats including mainstream and backwater areas such as slow runs, deep eddies, pools, and sloughs (Bestgen, 1990). It also inhabits reservoirs. Larval and juvenile razorback sucker habitat use is poorly understood, but is generally thought to be primarily shallow, slow moving areas, backwaters and littoral zones (Langhorst and Marsh, 1986; Bestgen, 1990). Razorback sucker spawns from January to May and initiation of spawning appears to be tied to water temperature (Langhorst and Marsh, 1986; Tyus and Karp, 1990). Spawning occurs in shallow water over large gravel, cobble, or coarse sand with little or no fine sediment on wave-washed lakeshores or riverine riffles (Minckley *et al.*, 1991). Razorback sucker lives up to about 50 years (McCarthy, 1987). It feeds on plankton, algae and detritus in reservoirs, with riverine populations also consuming a large amount of benthic invertebrates (Bestgen, 1990).

The 1887 type locality for razorback sucker is the Gila River at Fort Thomas, downstream from the mouth of Eagle Creek (Kirsch, 1888). Local residents reported that razorback sucker was common in the Gila River near Safford and Duncan in the early 1900's (Chamberlain, 1904). No historic reports of razorback sucker exist for Eagle Creek and little historic survey information on fish of Eagle Creek exists. Because of their presence in the Gila River at its mouth and the presence of apparently suitable habitat, Eagle Creek is presumed to have supported razorback sucker. Due to habitat alterations and losses and introduction and spread of nonnative species, the species was extirpated from the Gila River and its tributaries. Between 1981 and 1988, razorback sucker was reintroduced into Eagle Creek using hatchery stock originating from Lake Mohave (Hendrickson, 1993). Most stockings were made near the mouth of Willow Creek. These stockings were made prior to listing of the razorback sucker and when the species was listed in 1991 equal protection was given to stocked and natural populations.

No systematic surveys have been done to evaluate stocking success in Eagle Creek and recapture records are few. Two razorback sucker were caught in the impoundment above the Phelps Dodge diversion dam in 1986, 10 were caught downstream from Sheep Wash in 1987, 1 was caught below the gauging station in 1987, and one was caught near Hidden Tank Wash in 1988 (Marsh *et al.*, 1990; Minckley *et al.*, 1991; Hendrickson, 1993). Eagle Creek is considered to be occupied by razorback sucker, although whether or not a self-sustaining population has been established is not known.

Species Description and Status - Spikedace

Spikedace was listed as a threatened species on July 1, 1986 (USFWS, 1986a). Critical habitat was designated for spikedace on March 8, 1994, including Aravaipa Creek and portions of the Gila and Verde Rivers (USFWS, 1994b). Spikedace is a small silvery fish whose common name alludes to the well-developed spine in the dorsal fin (Minckley, 1973). Spikedace historically occurred throughout the mid-elevations of the Gila River drainage but is currently known only from Aravaipa Creek (Graham and Pinal Counties, Arizona), the upper Gila River (Grant and Catron Counties, New Mexico), the middle Gila River (Pinal County, Arizona), Eagle Creek (Greenlee County, Arizona), and the Verde River (Yavapai County, Arizona) (Barber and

Minckley, 1966; Minckley, 1973; Anderson, 1978; Barrett *et al.*, 1985; Bestgen, 1985; Sublette *et al.*, 1990; Jakle, 1992). Habitat destruction and competition and predation from introduced nonnative fish species are the primary causes of the species decline (Miller, 1961; Williams *et al.*, 1985; USFWS, 1986, Douglas *et al.*, 1994).

Spikedace lives in flowing water with slow to moderate water velocities over sand, gravel, and cobble substrate (Propst *et al.*, 1986; Rinne and Kroeger, 1988). Specific habitat for this species consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars, and eddies at downstream riffle edges (Propst *et al.*, 1986). Spikedace spawns from March through May with some yearly and geographic variation (Barber *et al.*, 1970; Anderson, 1978; Propst *et al.*, 1986). Actual spawning has not been observed, but spawning behavior indicates eggs are laid over gravel and cobble where they adhere to the substrate. Spikedace lives about two years with reproduction occurring primarily in one-year old fish (Barber *et al.*, 1970; Anderson, 1978; Propst *et al.*, 1986). It feeds primarily on aquatic and terrestrial insects (Barber and Minckley, 1983; Marsh *et al.*, 1989).

Spikedace was first reported from Eagle Creek in 1985 when it was collected as larval fish from lower Eagle Creek (Bestgen, 1985). Earlier surveys, including Miller's 1950 sample which documented loach minnow, did not find spikedace (Kynard, 1976; Minckley and Sommerfeld, 1979; Marsh *et al.*, 1990). In 1987, an intensive survey of Eagle Creek found spikedace common in the stretch from near Sheep Wash downstream to below the diversion dam (Marsh *et al.*, 1990). Although the biological assessment says that only one spikedace (*Meda fulgida*) has ever been found below the dam, there are records of two spikedace below the dam in 1985 and one in 1987. No spikedace have been found in several sampling efforts in Eagle Creek since 1987 (Marsh *et al.*, 1990, Marsh, 1993; Arizona Game and Fish Department, 1994; Knowles, 1994). Large fluctuations in numbers and distribution is a common pattern in short-lived, highly fecund fish species, particularly in marginal or deteriorated habitat and may be indicative of increased vulnerability to extinction (Minckley *et al.*, 1991) (Goodman, 1987). The failure of the spikedace population in Eagle Creek to rebound to the levels seen in 1987 may indicate habitat deterioration or may reflect sampling limitations.

Eagle Creek is not part of the designated critical habitat for spikedace. This omission is not due to quality of habitat or other biological factors. The spikedace population in Eagle Creek was not known to exist at the time critical habitat was proposed so was not included in the proposal and therefore could not be added in the final rule. The recovery plan for spikedace recommends addition of Eagle Creek to the critical habitat. However, addition of Eagle Creek would require publication of proposed and final rules in the Federal Register, which has not yet been done.

The effects of historic and present perturbations in the Gila River basin have resulted in fragmentation of spikedace range and isolation of remnant spikedace populations. The Eagle Creek population is isolated from its nearest spikedace population by a distance of approximately 100 river miles. Recent taxonomic and genetic work on spikedace indicate there are substantial differences in morphology and genetic makeup between remnant spikedace populations.

Anderson and Hendrickson (Anderson and Hendrickson, 1994) found that spikedace in the Verde River and Aravaipa Creek, are morphologically distinct with Eagle Creek and upper Gila River spikedace intermediate between the two extremes. Mitochondrial DNA and allozyme analyses have found similar patterns of geographic variation within the species, but do not include analyses of Eagle Creek spikedace (Tibbets, 1992).

Although the spikedace is currently listed as threatened, the Service has found that it warrants uplisting to endangered status. Reclassification is pending, however work on it is precluded due to work on other higher priority listing actions (USFWS, 1994c). The need for reclassification is not due to data on declines in the species itself, but is based upon increases in serious threats to a large portion of its habitat.

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.

Eagle Creek is a tributary of the Gila River in Greenlee County, Arizona. It is a spatially and temporally intermittent stream but is perennial in the project area. In the project area, Eagle Creek flows through a deeply incised narrow valley. "Normal" flows (median of yearly mean) at the stream gage near the dam are 38 cubic feet per second (cfs) (USGS 1994). Historic maximum flow is 36,800 cfs and historic minimum flow is 2.9 cfs. In the project area riparian vegetation is sparse with no significant riparian vegetation present in the immediate area of the diversion dam. The nearest riparian trees are two mesquite (Prosopis juliflora) and one cottonwood (Populus fremontii), more than 200 feet downstream from the dam apron. Upland vegetation is dominated by mesquite, juniper (Juniperus monosperma), shrub live oak (Quercus turbinella), catclaw acacia (Acacia greggii), yucca (Yucca sp.), prickly pear cactus (Opuntia phaeacantha), and lippia (Aloysia wrightii).

Human perturbations to Eagle Creek have come primarily from four types of activities. Grazing by livestock has been the primary pervasive use of the Eagle Creek watershed for the past 150 years with substantial alteration of watershed vegetation, soil, erosion, and hydrologic characteristics (Leopold, 1946). Water development and interbasin water transfers have altered the volume and timing of flow in the creek. In 1945, Phelps Dodge Corporation constructed a diversion from the Black River (Salt River basin) into Willow Creek, a tributary of middle Eagle Creek. This diversion augments flow in Eagle Creek below Willow Creek by about 27 percent (Minckley and Sommerfeld, 1979). That water, plus an additional 9 percent, is removed about 15 miles downstream at the diversion dam and pumping station. In addition, local residents pump groundwater from the basin for domestic and agricultural use and Phelps Dodge pumps

groundwater and places it into the stream channel for transport to the diversion dam for subsequent removal (USGS, 1994).

In addition to water manipulations, mining has affected Eagle Creek through watershed destruction (Dobyns, 1981; Marsh *et al.*, 1990). Residential and ranch operations, irrigated croplands, and roads along the Eagle Creek floodplain have had substantial impacts to the stream (Dobyns, 1981). Off-road vehicle use has also impacted portions of the stream. Human-caused impacts have altered hydrologic conditions within the Eagle Creek watershed resulting in an unstable, braided stream channel throughout much of the upper, non-canyon, reach of Eagle Creek. Destabilization of the stream channel has exacerbated flood damage with loss of riparian vegetation, unstable streambanks, and a wide, braided, cobble/gravel floodplain.

In addition to habitat alterations, various nonnative aquatic species have been introduced by humans into Eagle Creek and have adversely affected spikedace, loach minnow, razorback sucker, and other native fishes through predation and competition (Marsh *et al.*, 1990). Nonnative species that have been reported from Eagle Creek include black bullhead (*Ameiurus melas*), yellow bullhead (*Ameiurus natalis*), common carp (*Cyprinus carpio*), red shiner (*Cyprinella lutrensis*), mosquitofish (*Gambusia affinis*), channel catfish (*Ictalurus punctatus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), rainbow trout (*Oncorhynchus mykiss*), fathead minnow (*Pimephales promelas*), flathead catfish (*Pylodictis olivaris*), and crayfish (prob. *Orconectes virilis*) (Kynard, 1976; Minckley and Sommerfeld, 1979; Propst *et al.*, 1985; Hendrickson, 1987; Papoulias *et al.*, 1989; Brown, 1990; Marsh *et al.*, 1990; Knowles, 1994). Native species still form the majority of the fish community in Eagle Creek above the Phelps Dodge diversion dam, but nonnatives predominate below the dam. The long-term trend in the native/nonnative species balance is toward more nonnatives and less natives. However, the presence of the diversion dam has deterred the upstream movement of many nonnatives and available data are too limited to determine the present rate of the trend in upper Eagle Creek.

Three formal consultations/conferences have been completed addressing effects to spikedace and razorback sucker in Eagle Creek. The first of those was for the Apache-Sitgreaves National Forests Land Management Plan in May 1986. This consultation did not include razorback sucker because it was not listed at that time. It served as a conference report for spikedace, which was then a proposed species with proposed critical habitat. The conference report concluded that implementation of the standards and guidelines in the Forest Plan would not jeopardize the survival and recovery of spikedace.

The second was a formal consultation concluded in January 1994 on the effects of a Soil Conservation Service proposed channel stabilization project for flood damage repair at the Fillman Ranch. The biological opinion concluded the proposed project would not jeopardize the continued existence of spikedace.

The third was a formal consultation concluded in July 1995 on the effects of a proposed allotment management plan on the Baseline and Horse Springs livestock grazing allotments on the Apache-Sitgreaves National Forests, Clifton Ranger District. The biological opinion concluded the proposed project would not jeopardize the continued existence of razorback sucker or spokedace.

Although Eagle Creek supports a relatively intact native fish community, the past and present impacts to the stream and its fish are substantial. The rarity of both spokedace and loach minnow are indicative of the existing habitat degradation and increased presence of detrimental nonnative species. The continued existence of spokedace and razorback sucker in Eagle Creek is seriously imperiled. Any actions which contribute to further degradation of the habitat or which sustain the present degraded condition are cumulative to this existing environmental baseline and are therefore, of greater consequence to these species.

Direct and Indirect Effects of the Proposed Action

Repair of the dam by adding the proposed concrete abutment in the existing scour hole is unlikely to have any long term effects on the stream or the spokedace and razorback sucker. The hydrology and channel morphology of the project area and downstream are already highly modified. The repair is unlikely to alter or add to that modification. Riparian vegetation in the area is sparse and substantially altered and the proposed action is not expected to disturb any significant amount of riparian vegetation.

Although the scour pool within the work area is not likely to support spokedace in the long term, there is a possibility of spokedace being present in the pool as a temporary refuge during the current sub-average rainfall and flow conditions. Razorback sucker may also possibly be found in the scour pool below the dam. If razorback sucker are present, the scour pool would be relatively suitable habitat for the fish and one of the most likely places for any razorback sucker present to be found. Pumping the water from the pool and filling a portion of the pool with concrete would adversely affect both species, if present, by desiccation and death of individuals of the species.

During repair work the potential exists for introduction of toxic substances into the stream. Toxic substances may include petroleum products from project equipment, chemicals being used, or toxic leachate from raw cement coming in contact with stream water. This potential is expected to be minimal for the proposed project. The most likely source is the temporary concrete batch plant which will be located within the floodplain. Once the concrete is placed into the scour hole the hole will not fill with water and reestablish contact with downstream flow until after the concrete has set.

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 during the course of the Federal activity subject to consultation. Future Federal actions are subject to the consultation requirements established in section 7 and, therefore, are not considered cumulative in the proposed action.

Lower Eagle Creek is primarily privately owned. Ongoing activities occurring on these private lands that would be cumulative to the proposed action include water diversion, recreation, roads, off-road vehicles, and livestock grazing. No data are available at this time to estimate the level of impacts from those activities on Eagle Creek and its fish. However, it is probable that these activities contribute to the degraded condition of the stream channel and fish habitat in Eagle Creek and to the intermittency of stream flow.

Ongoing water manipulation to supply the Phelps Dodge mines and the towns of Morenci and Clifton, as discussed in the environmental baseline section, has substantial impacts that are cumulative to the proposed action. Some of those impacts may be beneficial, by increasing flow in Eagle Creek. However, other aspects, such as alteration of flow patterns and timing, disruption of groundwater functions, and importation of or improving habitat for nonnative fish are adverse to spikedace and razorback sucker.

Conclusion

After reviewing the current status of the spikedace and razorback sucker, the environmental baseline for the action area, the direct and indirect effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that implementation of repair of the spillway at the Phelps Dodge diversion dam is not likely to jeopardize the continued existence of the spikedace or razorback sucker. No critical habitat for either of these species is present in the action area.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, as amended, prohibits any 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 and 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. 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 incidental take statement. **The measures described below are nondiscretionary, and**

must be undertaken by the agency or made a binding condition of any grant or permit issued to the applicant, as appropriate.

The Service anticipates that the proposed repair of the Phelps Dodge diversion dam spillway may result in incidental take of spikedace and razorback sucker. Removal of water from the scour pool and filling a portion that pool with concrete would result in take of any listed species present in the pool. Take might occur in the form of death or harassment of the individuals in the pool from desiccation, handling, encasement in concrete, or failure to find suitable habitat in the relocation area. Mortalities might be reduced by the proposed seining and relocation of aquatic vertebrates, however, capture and transport of the listed fish would constitute harassment of individuals and some mortality is likely due to capture and handling stress, relocation in habitats that may or may not be entirely suitable, and predation and competition in the relocation habitats.

The anticipated level of incidental take for spikedace and razorback sucker is not expected to exceed 100 spikedace and 20 razorback sucker captured and relocated and 10 spikedace and 2 razorback sucker mortalities.

If, during the course of the action, the amount or extent of the incidental take anticipated is exceeded, the Corps 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.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the incidental taking authorized by this biological opinion.

1. Conduct all proposed actions in a manner that will minimize direct mortality of spikedace and razorback sucker.
2. Monitor the fish community and habitat to document levels of incidental take.
3. Maintain complete and accurate records of actions which may result in take of spikedace and razorback sucker and loss or modification of their habitat.

Terms and Conditions for Implementation

In order to be exempt from the prohibitions of section 9 of the Act, the Corps is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above.

1. The following terms and conditions will implement reasonable and prudent measure 1.
 - 1.1 All reasonable efforts shall be made to minimize use of heavy equipment within the wetted area of the Eagle Creek stream channel outside of the scour pool.
 - 1.2 All reasonable efforts shall be made to ensure that no pollutants enter surface waters during action implementation.
 - 1.3 During pumping of the scour pool, any razorback sucker or spikedace found shall be salvaged. A fish biologist shall be present at all times during emptying of the pool and transport and relocation of fish to oversee fish salvage operations.
 - 1.4 As the scour pool is pumped, fish shall be captured using nets or standard electrofishing gear. Any razorback found shall be moved above the dam into habitat appropriate for the species. Appropriate habitat for razorback sucker shall be the deepest pools available. Any spikedace found shall be relocated below the dam in habitat appropriate for the species. Appropriate habitat for spikedace shall be runs or riffles. Spikedace shall not be relocated above the diversion dam due to the potential for mistaken transport of red shiner.
 - 1.5 During the salvage operation, adequate holding facilities shall be available at the project site to hold any razorback sucker or spikedace captured until they can be moved into suitable habitat. A holding tank of a non-toxic material, with a minimum size of 100 gallons, shall be used. The tank shall be filled with water from the scour pool and shall have a constant supply of oxygen bubbling through the tank. Holding facilities and plans shall be approved by the Nongame or Fisheries Branch of Arizona Game and Fish Department prior to project implementation.
 - 1.6 Salvaged razorback sucker shall be moved upstream from the dam and salvaged spinedace shall be moved downstream from the dam using transport methods approved by the Nongame or Fisheries Branches of Arizona Game and Fish Department.
 - 1.7 Disposition or relocation of nonlisted fishes shall be in accordance with a valid State permit. However, no nonnative fishes shall be relocated from the project area into the stream or adjacent waters above the Phelps-Dodge diversion dam.
2. The following term and condition will implement reasonable and prudent measure 2.
 - 2.1 At all times when project activities are ongoing in or within 100 yards of the Eagle Creek, all reasonable efforts shall be maintained to monitor for the presence of dead or dying fish in and for 500 yards downstream of the activity

area. The Service shall be notified immediately by telephone upon detection of more than 25 dead or dying fish of any species in the stream below the scour pool.

3. The following term and condition will implement reasonable and prudent measure 3.
 - 3.1 A report of the project shall be submitted to the Service within 60 days following project completion. The report shall include complete information on the species and numbers of all fish found in the scour pool, the disposition of nonlisted fishes, and the numbers, size, condition, handling, transport, and final relocation site of any listed fishes.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the June 24, 1996 request for consultation on the proposed repair of the spillway of the Phelps-Dodge Eagle Creek Diversion Dam. As required by 50 CFR 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may impact 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.

We appreciate your assistance in this consultation. If we can be of further assistance, please contact Sally Stefferud or Ted Cordery.

Sincerely,


for Sam F. Spiller
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (GM:AZ)(AES)
Field Supervisor, Fish and Wildlife Service, Albuquerque, NM
Project Leader, Fish and Wildlife Service, Pinetop, AZ

Director, Arizona Game and Fish Department, Phoenix, AZ

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