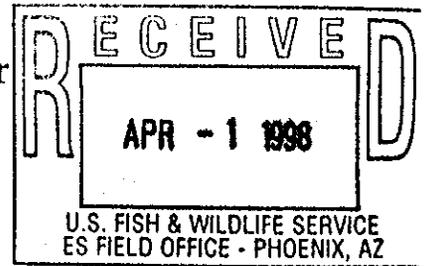




United States Department of the Interior

FISH AND WILDLIFE SERVICE  
P.O. Box 1306  
Albuquerque, New Mexico 87103



In Reply Refer To:  
R2/ES-HC

MAR 26 1998

2-21-97-F-082

Memorandum

To: Field Supervisor, Bureau of Land Management, Yuma, Arizona  
From: Assistant Regional Director, Ecological Services, Region 2   
Subject: Biological Opinion for Yuma District Resource Management Plan and Amendments

This responds to your November 27, 1996, memorandum to our Ecological Services Field Office in Phoenix, Arizona. You requested concurrence from the U.S. Fish and Wildlife Service (Service) under section 7 of the Endangered Species Act, as amended (Act), for findings regarding effects of the *Yuma District Resource Management Plan and Amendments* (RMP) on listed species. The Service has reviewed the Yuma District RMP and the *Biological Evaluation for the Yuma District Resource Management Plan and Amendments, November 1996*, (biological evaluation). In the biological evaluation, the Bureau of Land Management (BLM) concluded that the proposed action "may affect, but is not likely to adversely affect" American peregrine falcon (*Falco peregrinus anatum*), Sonoran pronghorn (*Antilocapra americana sonoriensis*), desert tortoise (Mohave population) (*Gopherus agassizii*), Yuma clapper rail (*Rallus longirostris yumanensis*), southwestern willow flycatcher (*Empidonax traillii extimis*), bald eagle (*Haliaeetus leucocephalus*), bonytail chub (*Gila elegans*) and its critical habitat, and razorback sucker (*Xyrauchen texanus*) and its critical habitat. The Service does not concur with the BLM's finding for the southwestern willow flycatcher, desert tortoise, bonytail chub, and razorback sucker and herein offers a biological opinion for these species and critical habitats.

The BLM also determined in the biological evaluation that the proposed action "may affect" the flat-tailed horned lizard (*Phrynosoma mcallii*), a species that was proposed to be listed as threatened at the time BLM submitted the biological evaluation to the Service. The Service's proposal to list the flat-tailed horned lizard was officially withdrawn on July 15, 1997. Therefore, the Service is not providing a conference opinion on this species.

This opinion is issued in accordance with section 7 of the Act (16 U.S.C. 1531 et seq.) and is based on information provided in: (1) Biological evaluation; (2) the *Yuma District Resource Management Plan*; (3) the *Yuma District RMP Amendment*, (January 1992); (4) the *Final Yuma District (Bill Williams) RMP Amendment* (March 1994); (5) *Proposed Yuma District (Havasu) RMP Amendment and Final Environmental Assessment* (September 1994); (6) the *Final Yuma District (Lands) RMP Amendment* (March 1996), (7) the BLM's

memorandum to the Service dated June 23, 1997, amending the proposed action; and (8) other sources of information. A complete administrative record of this consultation is on file in our Ecological Services Field Office in Phoenix.

## **FORMAT OF THE DOCUMENT**

This biological opinion is organized into eight major headings: Format of the Document; Consultation History; Description of Proposed Action; Concurrence On Not Likely to Adversely Affect Determinations; Affected Species; Incidental Take Statement; Reinitiation Statement; and Bibliography. Included in the section on Affected Species are biological opinions and incidental take statements for each species that the Service believes will be adversely affected by management direction in the RMP.

## **CONSULTATION HISTORY**

The Yuma District RMP was approved in March 1987. In conjunction with the preparation of the RMP, a final environmental impact statement also was prepared. At this time, the BLM determined that the only listed species in the resource planning area were Yuma clapper rail, American peregrine falcon, bald eagle, brown pelican and least tern. Adverse impacts were not identified by the BLM for any of these species. In December 1991, and again in October 1996, the BLM boundaries in Arizona were realigned by agency reorganization. In December 1995, the Service provided the BLM with a list of listed, proposed, and candidate species for the RMP's action area. The BLM prepared the biological evaluation dated November 1996, and transmitted it to the Service's Ecological Services Field Office in Phoenix via a November 27, 1996, memorandum. This memorandum included a request for formal conference for the flat-tailed horned lizard and concurrence for BLM findings of "not likely to adversely affect" for the American peregrine falcon, Sonoran pronghorn, Mohave population of the desert tortoise, Yuma clapper rail, southwestern willow flycatcher, bald eagle, bonytail chub, and razorback sucker. In a memorandum to the Service dated June 23, 1997, the BLM offered new management direction in the form of specific conservation measures for southwestern willow flycatcher.

A draft biological opinion for the Yuma District RMP was transmitted to the BLM on September 2, 1997. On January 25, 1998, the Service received the BLM's comments, dated January 24, 1998. The Service has given consideration to all of the BLM's comments in this biological opinion.

## **DESCRIPTION OF PROPOSED ACTION**

The proposed action for this consultation is the management direction found in the Yuma District RMP. This resource planning area encompasses 1,192,000 acres of BLM-administered land in Yuma, La Paz, and Mohave Counties, Arizona; and Imperial, Riverside, and San Bernardino Counties, California. The planning area includes 280 miles (mi) of the Lower Colorado River from Davis Dam along the Nevada-Arizona border, to the international boundary with Mexico.

The RMP addresses six major land use issues related to wildlife habitat, special management areas, grazing management, landownership adjustments, right-of-way for utility corridors and communication sites, and recreation management. The RMP provides land use decisions, terms, and conditions for guiding and controlling future management actions in the Yuma District RMP area. All BLM-administered activities and authorized uses in the RMP area must conform to the decisions, terms, and conditions in the RMP and amendment.

The RMP identifies two qualitatively different classes of actions that are addressed in this biological opinion. These are:

- (1) "General Management Decisions," or plan-level guidance and direction that are more general in nature. Site-specific management actions designed under the guidance and direction will require separate section 7 consultation before implementation.
- (2) "Management Decisions" taken under General Management Decisions that directly affect current, on-the-ground management and do not require further site-specific section 7 consultation before implementation.

This consultation does not preclude the need for the BLM to consult with the Service on future site-specific project actions carried out under the Yuma RMP and Amendment that: (1) The BLM determines "may affect" listed species; and (2) have not completed formal section 7 consultation.

Also considered as a part of this proposed action for this consultation are the Arizona Rangeland Health Standards approved by the Secretary of the Department of the Interior on April 28, 1997, and the new management direction for the Yuma District RMP that includes specific conservation measures for southwestern willow flycatcher. The BLM will implement the conservation measures in an ecosystem-based land management approach. These measures include:

#### **Southwestern Willow Flycatcher**

The new management direction in the form of conservation measures for the southwestern willow flycatcher is designed to map suitable and potential habitat on BLM-administered lands, survey habitats for the presence of southwestern willow flycatchers, and provide protective measures for habitats which are currently suitable or have the potential to become suitable southwestern willow flycatcher habitat. These measures will be integrated with current management direction provided by the BLM's Riparian Management Policy and the Arizona Rangeland Health Standards and Guidelines. Both policies emphasize the importance of managing riparian systems in a proper functioning condition while enhancing potential natural communities.

The new management direction is incorporated into the consultations for:

- Lower Gila North Management Framework Plan (MFP)/Grazing Environmental Impact Statement (EIS)

- Lower Gila South RMP and 1988 Amendment
- Phoenix RMP
- Eastern Arizona Grazing EIS
- Upper Gila-San Simon Grazing EIS (Phoenix portion)
- 13 Allotments along the Gila River
- Kingman RMP reinitiation
- Yuma RMP

### **Conservation Measures for Southwestern Willow Flycatcher**

The BLM in Arizona will develop and implement an action plan for the southwestern willow flycatcher that provides protective guidance for managing southwestern willow flycatcher habitat and implementing BLM-authorized activities. This action plan will provide guidance to Arizona BLM Field Offices for implementing decisions authorized in their respective planning documents (RMP's, MFP's, and associated grazing EIS's). Minimal features of the plan will include the following.

1. **Mapping:** Maps that convey the following information about southwestern willow flycatcher habitat managed by the BLM Field Office:
  - a. Location, size, shape, and spacing of habitat areas;
  - b. Habitat stage with respect to southwestern willow flycatchers according to the following classification: suitable-occupied, suitable-unoccupied, suitable-unsurveyed, potential in the short term (1 to 3 years), and potential in the long-term (greater than 3 years);
  - c. Status of southwestern willow flycatcher surveys for each area of suitable habitat: either the date(s) surveyed or indication that the area has not been surveyed.
2. **Southwestern Willow Flycatcher Surveys:** A list of areas to be surveyed following the most recent Service recommended protocol, along with the anticipated completion date for the survey of each area.
3. **Habitat Management Guidelines:** Management guidelines (fencing, grazing system used, or southwestern willow flycatcher habitat improvement activities) for areas at each of the habitat stages defined above for mapping. These guidelines should include:
  - a. Exclusion of livestock grazing within occupied or unsurveyed, suitable habitat during the breeding season (April 1-September 1).
  - b. Management of suitable southwestern willow flycatcher habitat so that its suitable characteristics are not eliminated or degraded.

- c. Management of potential southwestern willow flycatcher habitat to allow natural regeneration (through natural processes) into suitable habitat.
4. **Cowbird Control:** To reduce the likelihood of nest abandonment and loss of southwestern willow flycatcher productivity owing to cowbird parasitism associated with BLM-authorized grazing activities in or near occupied habitats, BLM will implement the following:
- a. Investigate and identify livestock concentration areas on BLM lands in the action areas that are likely foraging areas for brown-headed cowbirds within a 5-mi radius of occupied or unsurveyed suitable southwestern willow flycatcher habitat, and evaluate ways to reduce any concentration areas found.
  - b. If cowbird concentrations indicate a strong likelihood that parasitism to southwestern willow flycatcher nests is occurring or actual parasitism is documented through nest monitoring, possible cowbird foraging areas will be assessed, and appropriate control measures for cowbirds will be implemented. Evaluation of possible parasitism applies to active flycatcher nests on BLM-administered lands which are within 5 mi of BLM-authorized grazing activities. These efforts will be coordinated with the Service and the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service. Monitoring and/or control activities will be conducted by qualified personnel with appropriate permits.

## CONCURRENCE ON NOT LIKELY TO ADVERSELY AFFECT DETERMINATIONS

The BLM determined in the biological evaluation that the proposed action "is not likely to adversely affect" Sonoran pronghorn (*Antilocapra americana sonoriensis*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), Yuma clapper rail (*Rallus longirostris yumanensis*), southwestern willow flycatcher (*Empidonax traillii extimis*), desert tortoise (*Gopherus agassizii*), bonytail chub (*Gila elegans*), and razorback sucker (*Xyranuchen texanus*). The Service concurs with the BLM's findings for American peregrine falcon, Yuma clapper rail, Sonoran pronghorn, and bald eagle. The Service does not concur with the BLM's findings for the desert tortoise, southwestern willow flycatcher, bonytail chub and razorback sucker; a biological opinion is offered herein for each of these species.

Although suitable habitat exists for peregrine falcons in portions of the Yuma District, no peregrines were observed during surveys conducted in 1989 and 1990. In addition, restrictions on timing and use of off-road vehicles and construction of new improvement projects near suitable peregrine habitat are discussed in the RMP and amendment. RMP actions that designate and protect riparian area as priority habitat should provide adequate protection for Yuma clapper rails, because no livestock grazing occurs in proximity to rail habitat. Sonoran pronghorn habitat occurs in isolated parcels of land in the Mohawk Valley between the Barry M. Goldwater Range and the Gila River, and radio-telemetry data indicate that pronghorns occur further south. Impacts from livestock grazing and

recreational use of off-road vehicles are not expected because these activities do not occur within these areas. Boating could potentially disturb bald eagles in the Yuma resource planning area, but the Service believes the impacts will be insignificant and discountable. Also, some of the action decisions in the RMP that relate to the protection of riparian habitat should provide additional protection for potential eagle nesting habitats.

## BIOLOGICAL OPINION

### AFFECTED SPECIES

#### SOUTHWESTERN WILLOW FLYCATCHER (*EMPIDONAX TRAILII EXTIMIS*)

##### Status of the Species (Range Wide)

The southwestern willow flycatcher was proposed for listing as endangered, with critical habitat, on July 23, 1993. Final rules to list the species as endangered and to designate critical habitat were published on February 27, 1995, and July 22, 1997, respectively. The following information is developed from a compilation of unpublished data.

The southwestern willow flycatcher is a small passerine bird. It is a neotropical migratory species that breeds in the southwestern United States and migrates to Mexico, Central America, and possibly northern South America during the nonbreeding season. The historical range of the southwestern willow flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico.

##### Life History

The southwestern willow flycatcher is a small riparian obligate bird nesting along rivers, streams, and other wetlands where dense growths of willow (*Salix* sp.), *Baccharis*, buttonbush (*Cephalanthus* sp.), boxelder (*Acer negundo*), saltcedar (*Tamarix* sp.), or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.) and/or willow. The species is an insectivore, foraging within and above dense riparian vegetation, taking insects on the wing, or gleaning them from foliage.

Birds begin arriving on breeding grounds in late April and May. Migration routes are not completely known. However, willow flycatchers have been documented migrating through specific locations and drainages in Arizona that do not currently support breeding populations, including the upper San Pedro River, Colorado River through Grand Canyon National Park, lower Colorado River, Verde River tributaries, and Cienega Creek. These observations probably include subspecies *E.t. brewsteri* and *E.t. adastus*. *Empidonax* flycatchers rarely sing during fall migration so that a means of distinguishing some migrating *Empidonax* without a specimen is not feasible. However, willow flycatchers have been reported to sing and defend winter territories in Mexico and Central America.

Southwestern willow flycatchers begin nesting in late May and early June and fledge young from late June through mid-August. Southwestern willow flycatchers typically lay three to

four eggs in a clutch (range = 2-5). The breeding cycle, from laying of the first egg to fledging, is approximately 28 days. Eggs are laid at 1-day intervals; they are incubated by the female for approximately 12 days; and young fledge approximately 12 to 13 days after hatching. Southwestern willow flycatchers typically raise one brood per year but have been documented raising two broods during one season. Southwestern willow flycatchers have also been documented reneating after nest failure.

Survivorship of adults and young have been reported as: of 58 nestlings banded since 1993, 21 (36 percent) returned to breed; of 57 birds banded as adults (after hatch year) since 1989, 18 (31 percent) returned to breed at least 1 year (10 males, 8 females), 5 (9 percent) returned to breed for 2 years (all males), and 2 (3.5 percent) returned to breed for 3 years. A statistically significant variation in return rates of juveniles also has been documented as a function of fledging date; approximately 21.9 percent of juveniles fledged on or before July 20 returned the following year, whereas only 6.4 percent of juveniles fledged after July 20 returned the following year.

Range wide, occupied habitat for the southwestern willow flycatcher can be characterized by dense patches of riparian shrubs or trees including stands of native vegetation and occasionally, exotic vegetation. The size and shape of occupied riparian habitat patches vary considerably. Southwestern willow flycatchers have been found nesting in patches as small as 0.8 hectare; e.g., Grand Canyon, and as large as several hundred hectares; e.g., Roosevelt Lake, Lake Mead). When viewed from above, mixed vegetation types often appear as a mosaic of plant species and patch shapes and sizes. In contrast, narrow, linear riparian habitats one or two trees wide do not appear to contain attributes attractive to nesting flycatchers. However, flycatchers have been found using these habitats during migration.

Open water, cienegas, marshy seeps, or saturated soil are typically in the vicinity of flycatcher nests. Southwestern willow flycatchers have been documented nesting in areas where nesting substrates were in standing water. At some locations, particularly during drier years, water or saturated soil is only present early in the breeding season; i.e., May and part of June. However, the total absence of water or visibly saturated soil has been documented at sites where the river channel has been modified; e.g., creation of pilot channels, where modification of subsurface flows has occurred; e.g., agricultural runoff), or as a result of natural changes in river channel configuration.

Southwestern willow flycatcher nests are typically placed in the fork of a branch with the nest cup supported by several small-diameter vertical stems. The main branch from which the fork originates may be oriented vertically, horizontally, or at an angle, and stem diameter for the main supporting branch can be as small as 3 to 4 centimeters. Vertical stems supporting the nest cup are typically 1 to 2 centimeters in diameter. Occasionally, southwestern willow flycatchers place their nests at the juncture of stems from separate plants, sometimes different plant species. Those nests are also characterized by vertically-oriented stems supporting the nest cup. Nest height relative to the base of nest substrate also varies across the southwestern willow flycatcher's range.

Flycatchers using predominantly native broadleaf riparian habitats nest relatively low to the ground [between 1.8 meters and 2.1 meters on average], whereas those using mixed native/exotic and monotypic exotic riparian habitats nest relatively high above the ground (between 4.3 meters and 7.4 meters on average). Historic egg/nest collections and species' descriptions from throughout the southwestern willow flycatcher's range confirm the bird's widespread use of willow for nesting.

### Population Dynamics

Intensive nest monitoring efforts in California, Arizona, and New Mexico have revealed that: (1) Sites with both relatively large and small numbers of pairs have experienced extremely high rates of brood parasitism; (2) high levels of cowbird parasitism in combination with nest loss due to predation have resulted in low reproductive success and, in some cases, population declines; (3) at some sites, levels of cowbird parasitism remain high across years, while at others parasitism varies temporally with cowbirds absent in some years; (4) the probability of a flycatcher successfully fledging its own young from a nest that has been parasitized by cowbirds is low; i.e., < 5 percent; (5) cowbird parasitism and nest loss due to predation often result in reduced fecundity in subsequent nesting attempts, delayed fledging, and reduced survivorship of late-fledged young; and (6) nest loss due to predation appears more constant from year-to-year and across sites, generally in the range of 30 to 50 percent.

Besides lowering nest success, fecundity, and the number of young produced, cowbird parasitism may also lower survivorship of flycatcher young fledged late in the season. Southwestern willow flycatchers that abandon parasitized nests, or renest after fledging cowbirds, lay fewer eggs in subsequent clutches and, if successful, fledge flycatcher young late in the season. Cowbird parasitism has been shown to delay successful flycatcher nesting by at least 13 days and this delay resulted in significantly different return rates of juveniles. Only 6.4 percent of flycatcher young that came from late nests were recaptured in subsequent years, whereas 21.9 percent of young that came from early nests were recaptured. If these recapture rates mirror actual survivorship, then even though some parasitized flycatchers eventually fledge their own young, nest loss due to parasitism or depredation may have the more insidious effect of reducing overall juvenile survivorship.

Cowbird parasitism and nest depredation are adversely affecting southwestern willow flycatchers throughout their range. Cowbirds have been documented at more than 90 percent of sites surveyed. Parasitism rates have been highly variable, at the same sites, from one year to the next. Thus, the potential for cowbirds to be a persistent and widespread threat remains high.

### Status and Distribution

*E.t. extimus* was first described from a specimen collected by Gale Monson on the lower San Pedro River near Feldman, Arizona. The taxonomic validity of *E.t. extimus* was subsequently reviewed and has been accepted by most authors. Historical and contemporary records of *E.t. extimus* have been reviewed throughout its range revealing

that the species has "declined precipitously. . ." and that "although the data reveal no trend in the past few years, the population is clearly much smaller now than 50 years ago, and no change in the factors responsible for the decline seem likely."

The loss of more than 70 breeding locations range wide has been documented, including locations along the periphery and within core drainages that form this subspecies' range. Rangewide estimates of the southwestern willow flycatcher population were found to be comprised of 500 to 1,000 pairs. Since 1992, more than 800 historic and new locations have been surveyed range wide to document the status of the southwestern willow flycatcher (some sites in southern California have been surveyed since the late 1980's). Survey efforts in most States were done under the auspices of the Partners in Flight program, which served as the coordinating body for survey training sessions and review and synthesis of data. The extensive and, in some case, intensive nature of these efforts have provided a critical baseline for the current distribution, abundance, and reproductive success of southwestern willow flycatchers range wide.

Range wide, the current known population of southwestern willow flycatchers stands at 454 territories. This indicates a critical population status; more than 75 percent of the locations where flycatchers have been found are composed of five or fewer territorial birds and up to 20 percent of the locations are comprised of single, unmated individuals. The distribution of breeding groups is highly fragmented, with groups often separated by considerable distances; e.g., approximately 88 kilometers straight-line distance between breeding flycatchers at Roosevelt Lake, Gila County, Arizona, and the next closest breeding groups known on either the San Pedro River (Pinal County) or Verde River (Yavapai County). Additional survey effort, particularly in southern California, may discover additional small breeding groups. However, range wide survey efforts have yielded positive results in less than 10 percent of surveyed locations. Moreover, survey results reveal a consistent pattern range wide: the southwestern willow flycatcher population as a whole is comprised of extremely small, widely separated breeding groups or unmated flycatchers.

#### **Status of the Species (In the Action Area)**

Prior to the early 1900's, the southwestern willow flycatcher was a fairly common breeder in the Lower Colorado River Valley (Rosenberg et al., 1991). The loss of native vegetation along the Lower Colorado River below Hoover Dam has been well documented. The alteration of water flows began with the construction of Laguna Dam in 1907. Construction of Hoover, Parker, and Imperial Dams in the 1930's permanently changed the natural flooding pattern of the Lower Colorado River. Annual floods have been reduced or eliminated, affecting native vegetation species such as Fremont cottonwood and black willow that depend on periodic floods for regeneration. Soil and water salinity levels have risen as a result of irrigation practices and evaporation from reservoirs behind dams. These conditions favor the spread of saltcedar, an exotic species introduced during the 1920's. Most native species are salt intolerant while saltcedar thrives under highly saline conditions. In 1986, an estimated 40 percent of the riparian area along the Lower Colorado River from Davis Dam to Mexico consisted of a pure stand of saltcedar;

43 percent consisted of a mixture of native species and saltcedar. Only 0.7 percent could be considered mature cottonwood and willow habitats (Ohmart et al., 1988).

Southwestern willow flycatchers have been surveyed along the Lower Colorado River since 1993 by personnel from a number of agencies including the BLM, Arizona Game and Fish Department, and the Service. Southwestern willow flycatchers have been recorded in numerous areas along the river including the Limotrophe Division south of Yuma; an area near Ehrenberg, Arizona; and the Bill Williams River Delta. A nest was located at Bill Williams River National Wildlife Refuge in 1994. In 1996, researchers under contract with Reclamation observed birds carrying nest material near the river north of Palo Verde, California. They also observed possible nest construction along the Gila River near Fortuna Wash.

### **Effects of the Action**

The effects of activities guided by the decisions, terms, and conditions of the Yuma RMP, along with the new management direction, are analyzed by program area. Codes such as WF-9 in the text refer to specific RMP direction identified in the biological evaluation.

#### **Wildlife and Fisheries:**

RMP actions that designate and protect riparian areas as priority wildlife habitat (WF-9, WF10, WF-15, WF-16, WF-19, WF-21, WF-22, WF-23, WF-25, WF-26) and establish the Bill Williams Riparian Management Area (SMA-17, SMA-18, SMA-19) provide protection for the remaining tracts of riparian woodland that may provide habitat for the southwestern willow flycatcher. Off-road vehicle traffic is restricted to existing roads and trails, although the impacts of existing traffic are not addressed in the biological evaluation. Acquisition of additional riparian habitat would extend Federal protection to additional areas. During high flow years, some natural revegetation to cottonwood and willow still occurs along the Colorado, Bill Williams, and Gila Rivers. On BLM-administered lands, these tracts are also protected as priority wildlife habitat. Limiting new access and uses are important factors in the successful establishment of riparian habitat in these areas. Utility rights-of-way within priority wildlife habitat is confined to designated corridors "whenever practical."

BLM and other agencies have attempted riparian revegetation at several locations along the river with varying degrees of success. BLM has planted cottonwood poles in the Laguna and Imperial Divisions, in the Parker Strip, and along Lake Havasu. BLM cooperated with California Department of Fish and Game in a contract to revegetate a 15-acre site near Needles, California, following a wildfire. Future work proposed in interagency plans along the river would protect existing riparian woodland stands from fire and other disturbances and would develop new stands of riparian woodland at suitable sites. Although it is unknown whether these areas will provide habitat characteristics suitable for nesting use by southwestern willow flycatchers, the new management direction requiring mapping and survey of potential southwestern willow flycatcher habitat should assist in the delineation and protection of areas that develop suitable characteristics.

### Range Management:

No livestock grazing occurs in proximity to suitable southwestern willow flycatcher habitat. The only livestock grazing allotment along the Bill Williams River within the planning area has not been grazed since 1983, although grazing use could be authorized in the future. Riparian condition along the Colorado and Bill Williams Rivers is primarily a result of a combination of controlled water flows, low flows, channelization, and the spread of saltcedar rather than other land uses. The effects of grazing on the potential habitat and its regeneration to suitable habitat was provided in the biological evaluation. The new management direction protecting flycatchers from these impacts include: breeding season exclusion of livestock grazing within occupied or unsurveyed, suitable habitat so that it is not degraded; management of potential habitat to allow natural regeneration; and cowbird control measures when grazing occurs in or near occupied flycatcher habitat.

### Wild Horse and Burro Program:

Burros occur along both the Colorado and Bill Williams Rivers and are protected by the Wild and Free Roaming Horse and Burro Act of 1971. Providing fenced access routes to the river for wild burros (WHB-2) would reduce development of new trails and any consequent loss of riparian habitat. Grazing by burros can potentially destroy or degrade the riparian habitat for southwestern willow flycatchers, primarily through the suppression of regeneration of potential habitat. Impacts can include severe impacts on flycatcher habitat composition and structure. Trampling may alter riparian plant communities by direct damage to plants, or by damaging soils. Plant densities, cover, biomass, vigor, and regeneration capacities may be reduced. Burros near flycatcher nesting areas increase the likelihood of cowbird parasitism of flycatcher nests by improving cowbird access to flycatcher nests. Although the RMP does not explicitly provide for special consideration of endangered and threatened species in burro management, the new direction should protect flycatchers from these impacts. These measures include: management of potential habitat to allow natural regeneration; and cowbird control measures when grazing occurs in or near occupied flycatcher habitat.

### Fire Management:

Prescribed burning (F-2) could be conducted in the future if a fuel model is developed. This tool would be used to control invasion of saltcedar and reduce the accumulation of fuels in order to relieve wildfire hazards. This technique may provide net benefits to flycatchers by reducing the spread of wildfire into existing riparian areas.

### Lands:

Continuing to lease lands for agricultural use (L-14) precludes the establishment of riparian habitat for flycatchers on these sites. The biological evaluation indicates that most agricultural leases are not suitable for riparian development because water tables are too deep or fluctuate too much to permit tree growth without irrigation. Leases will not be reissued if site-specific plans are developed to use these sites for other purposes, including wildlife habitat (L-15). A plan for an alternative use of the Pratt agricultural lease near

Laguna Dam is currently being developed. Agricultural use also attracts brown-headed cowbirds and great-tailed grackles to these areas. The agricultural permits and leases are all adjacent to or near private farmlands and may have little additional effect on potential nest parasitism or predation of flycatchers by these species.

Direction in the RMP, with its March 1996 amendment, governs land disposal, acquisition, and exchanges. Acquisition and consolidation of landownership could have beneficial effects on the flycatcher, especially when the object of the action is to enhance wildlife habitat values. Land disposal or exchanges could have adverse effects if they involve flycatcher habitat, although the RMP provides that any land identified for disposal must be evaluated for significant threatened and endangered species resources before transfer of land is completed. The new management direction requires survey and mapping to assist in determining whether suitable or potential flycatcher habitat exists on lands considered for disposal or transfer.

Activities under lands also include authorizations for utility corridors, communication sites, and rights-of-way. Limiting rights-of-way and communication facilities to existing corridors and sites may limit the increase of impacts. The RMP and Amendments of September 1994 would designate additional lands for right-of-ways. The survey, mapping, and habitat protection provided by the new management direction should eliminate or greatly reduce any impacts from continuing or new land use authorizations.

#### Recreation:

Most recreational sites in the planning area are located adjacent to the Colorado River. Most sites receive high levels of use during summer, including camping, picnicking, fishing, and boating access. These activities in the flycatcher's riparian habitat during the nesting season can reduce reproductive success. Public use also increases the risk of wildfires that remove riparian vegetation along the river corridor. The September 1994 amendments to the RMP would provide for a competitive-use off-road vehicle race and an additional off-road vehicle area. Although the biological evaluation does not establish whether riparian areas exist in the areas that would be impacted, the habitat management guidelines in the new direction should assist in minimizing current impacts and in avoiding impacts in the future.

#### Minerals Management:

Mining activities under Minerals Management can result in surface-disturbing activities and the use of heavy equipment in potential flycatcher habitat. The RMP provides some protection from the impacts of these activities by mineral withdrawal in certain areas in the planning area. Sand and gravel permits are not authorized within priority wildlife habitats and certain other areas. The January 1992 amendment to the RMP provides additional protection by eliminating surface occupancy on oil and gas leases in riparian areas as a designation of the Bill Williams Riparian Management Area. Also, the identification of important areas for flycatchers as a result of the new direction will assist the BLM in considering areas for future mineral withdrawal.

#### Cultural Resources; Soil; Water; and Air:

Activities under the program area of Cultural Resources include Soil, Water, and Air Resources; Vegetation Management; Wilderness; and Special Management Areas. These are likely to have beneficial effects for the flycatcher and its habitat or to have no effect.

#### Cumulative Effects

Cumulative effects include the effects of future State, 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.

Loss of habitat on private lands continues due to urbanization, agricultural clearing, habitat alteration and livestock grazing range wide. Nest parasitism by brown-headed cowbirds is likely to continue to be a problem with no easy solution. Mixed landownership in the planning area and elsewhere limit Federal regulatory authority to control cowbirds. Given the scattered pattern of BLM lands and proximity of many holdings to developing areas, that cumulative effects include continued grazing on private lands, water diversions that affect riparian habitat, and urban expansion.

#### Conclusion

After reviewing the current status of the southwestern willow flycatcher, the environmental baseline for the action area, the effects of the proposed action, and available information on cumulative effects, it is the Service's biological opinion that continuation of management direction in the RMP is not likely to jeopardize the continued existence of the southwestern willow flycatcher. No critical habitat for the flycatcher has been designated within the area affected by the Yuma RMP, therefore none will be affected.

#### Incidental Take Statement

With the BLM's immediate implementation of the conservation measures to provide management direction for the southwestern willow flycatcher in the Yuma resource planning area, the Service does not anticipate that the proposed action will take any flycatchers.

#### Conservation Recommendations

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for southwestern willow flycatcher.

In furtherance of the purposes of the Act, the Service recommends implementing the following action:

1. The BLM should consider adding direction developed for the southwestern willow flycatcher to the Yuma RMP when it is next amended, or to any future, comparable document that covers the resource planning area.

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 recommendation.

### BONYTAIL CHUB (GILA ELEGANS)

#### **Status of the Species (Range Wide)**

The bonytail chub was first proposed for listing under the Act on April 24, 1978, as an endangered species. The species was listed as endangered on April 23, 1980, with an effective date of the rule of May 23, 1980. In the final rule, the Service determined that at that time there were no known areas with the necessary requirements to be determined critical habitat. The final rule to designate critical habitat for the bonytail chub was published on March 21, 1994, with an effective date of April 20, 1994. Critical habitat for the species includes portions of the Colorado, Green, and Yampa Rivers in the Upper Colorado River Basin, and the Colorado River in the Lower Basin.

#### **Description**

The bonytail chub is one of three closely related members of the genus *Gila* found in the Colorado River. Confusion about the proper taxonomy and the degree of hybridization between the bonytail chub, the humpback chub, (*Gila cypha*), and roundtail chub, (*G. robusta*), has complicated examinations of the status of these fish. The bonytail chub was originally described from specimens taken in Arizona (Baird and Girard 1853). The bonytail chub is a highly streamlined fish with a very thin, pencil-like caudal peduncle and large, falcate fins (Allan and Roden 1978). A nuchal hump may be present behind the head. Maximum length is about 600 millimeters, with 300-350 millimeter more common (USDI 1990). Weights are generally less than one kilogram (Vanicek and Kramer 1969). Bonytail chub are long-lived fish, reaching at least 49 years of age (Minckley 1985).

#### **Life History**

Life history information for the bonytail chub was recently summarized in the recovery plan (USDI 1990) and in the biological support document for the critical habitat designation (USDI 1993). It is important to note that life history information on this species is limited. The information presented in this biological opinion is primarily taken from these sources.

The bonytail chub was once abundant in the Colorado River and its major tributaries throughout the Colorado River Basin, occupying 3,500 mi of river in the United States and Mexico. With the confusion between the bonytail chub and roundtail chub arising from use

of the common names "bonytail chub" and "trout" for both species, specific information on abundance may be lacking. However, the Service is reasonably certain that records from the lower Colorado River were bonytail chub and not roundtail chub. Records from the late 1800's and early 1900's indicated the species was abundant in the lower Colorado and Gila River drainages (Baird and Girard 1853, Kirsch 1889, Gilbert and Scofield 1898, Miller 1961).

With their streamlined bodies, bonytail chub appear to be adapted to the Colorado River and large tributary streams. Even with these adaptations, this species does not select areas of high velocity currents and its use of pools and eddies by the fish is significant (Vanicek and Kramer 1969). Grinnell in 1914 captured bonytail chubs in a backwater along the Lower Colorado River. There is limited information on migrations or other movements.

Spawning takes place in the late spring to early summer (Jones and Sumner 1954, Wagner 1955) in water temperatures about 18° C (Vanicek and Kramer 1969). Riverine spawning of the bonytail chub has not been documented; however, gravel bars or shelves are used in reservoirs (Jones and Sumner 1954). Bonytail chub may be flexible in their spawning habitat needs as evidenced from successful spawning in hatchery ponds at Dexter National Fish Hatchery and raceways at Willow Beach National Fish Hatchery.

The needs of larval and juvenile bonytail chubs are not well known. Few larvae have been identified in the Lower Basin. In the Upper Basin, there is confusion between larvae of the bonytail chub and other chubs, so interpreting data is difficult. It is known that young fish prey on aquatic invertebrates, especially chironomid larvae and mayfly nymphs (Vanicek and Kramer 1969). It is likely that quiet water habitats are preferred habitats for young fish, given the success of raising them in man-made ponds.

#### Population Dynamics

The bonytail chub is adapted to the widely fluctuating physical environment of the historical Colorado River. Adults can live 45-50 years, and apparently produce viable gametes even when quite old. The ability to spawn in a variety of habitats is also a survival adaptation. In the event of several consecutive years with little or no recruitment (due to either too much or too little water), the demographics of the population as a whole might shift, but future reproduction would not be compromised. Fecundity measurements taken on adult females in the hatchery ranged from 1,015 to 10,384 eggs per fish with a mean of 4,677 (USDI 1990). With the fecundity of the species, it would be possible to quickly repopulate after a catastrophic loss of adults.

Severe reductions in both population numbers and individual bonytail chub numbers can be traced largely to impounding the lower Colorado River and introducing nonnative fish into the modified environment. Dams created reservoirs that favored survival and expansion of species adapted to lentic systems. Deep water releases from large reservoirs created habitat immediately downstream of reservoirs that was ideal for cold water species. Conversely the bonytail chub had adapted to a riverine system tied to periodic flooding of the free flowing Colorado River. With physical modification of the free flowing river and

introduction of many nonnative species, nonnative species in the lower Colorado River system far exceed the number of native species.

The bonytail chub was listed as an endangered species due to massive declines in, or extirpation of, all populations throughout the range of the species. The causes of these declines are changes to biological and physical features of the habitat. The effects of these changes have been most noticeable by the almost complete lack of natural recruitment to any population in the historic range of the species. Populations are generally small and composed of aging individuals. Recovery efforts under the Recovery Implementation Program in the Upper Basin have begun, but significant recovery results have not been seen for this species. In the Lower Basin, augmentation efforts along the lower Colorado River propose to replace the aging populations in Lake Havasu and Lake Mohave with young fish from protected-rearing site programs. This may prevent the imminent extinction of the species in the wild, but appears less capable of ensuring long term survival or recovery of the bonytail chub. Overall, the status of the bonytail chub in the wild continues to be precarious.

#### **Status of the Species (In the Action Area)**

Within the Yuma resource planning area, designated critical habitat includes the Colorado River from its northern boundary of the Havasu National Wildlife Refuge to Parker Dam, including Lake Havasu up to its full pool elevation. In general, the bonytail chub is considered the rarest fish in the Colorado River Basin. In the past, 100 years the Colorado River has been highly altered. Dams, impoundments, water diversions, and channelization have altered water flows and have reduced or eliminated seasonal flooding. In Lake Havasu, bonytail chub now are found in small numbers. The BLM has been conducting a fish habitat improvement program in Lake Havasu since 1992, and also is a participant in a bonytail chub reintroduction program in Lake Havasu. Since 1993, a total of 168,000 juvenile fish have been released into coves and off-site grow-out pools of lake Havasu via interagency cooperative efforts of the Service, the BLM, and other agencies. Another 20 individuals greater than 250 millimeters in length have been released into the lake. The number of fish actually stocked from these efforts is about 400.

#### **Effects of the Action**

The BLM has determined in the biological evaluation that some of the RMP actions affect aquatic habitats in the Colorado River. These actions are guided by the decisions of the Yuma RMP and are analyzed by program area here. Codes such as WF-9 in the text refer to specific RMP management action identified in the biological evaluation. Program areas not discussed below have insignificant, discountable, or no effect on the species.

#### **Recreation Management in Floodplains**

Management action R-7 is directed at retention of lands in or adjacent to the 100-year flood plain in Federal ownership so that public opportunities for Colorado River recreation continue to be available in the future. Public use of the 100-year flood plain can impact shoreline that may provide habitat and food resources for all life stages of bonytail chub.

Although BLM-authorized public access to the Colorado River can result in impacts to shoreline areas used by the bonytail chub, the ability of the BLM to regulate that access is not expected to result in increased impacts for bonytail chub or the species' critical habitat.

#### Lands

Management activity L-15 provides for the retention of agricultural lands along the Colorado River in Federal ownership. The ultimate disposition of these lands is to be determined following further analysis, including delineation of the 100-year flood plain. Use of shoreline areas for agriculture activities involving bank stabilization, water diversion activities, pesticide use activities, and other habitat-altering activities could result in impacts to the bonytail chub. However, the retention of the lands under Federal authority will allow the BLM to maintain management authority along the Colorado River, and this direction is not expected to result in increased impacts to bonytail chub or its habitat.

#### Recreation Management

Management activity R-9 allows only permanent new facilities that can be flood proofed to remain on the 100-year flood plain. Existing permanent structures are allowed to remain until they are inundated, their useful life is gone, or the present lease expires. Restricting new structures to flood proofing, and reducing the numbers of existing structures that are not flood-proofed should not result in increased impacts to the bonytail chub or its habitat in Lake Mohave.

Management activities R-10 and R-11 allow short-term camping on the 100-year flood plain during periods of normal water levels and long-term winter camping within concession areas.

R-15 allows the continued lease of recreation areas for concession State park and county operation and allows private enterprise to provide services and facilities that are responsive to public needs. Management activity R-20 involves the review of existing leases as they come up for renewal, as well as allows for extensions or modification of existing leases in conformity with the RMP or with public needs. Also, R-5 and R-16 allow for the expansion of recreational facilities. Actions that expand recreational fishing or recreational facilities increase the probability that associated activities will result in greater impacts to the bonytail chub and the species habitat; i.e., take or capture bonytail chub by fishermen, introduction of nonnative fish, or impacts to the shoreline. The BLM has posted signs since 1993 providing instructions for reporting captured bonytail, and no reports have been received since that time.

#### Cumulative Effects

Cumulative effects include the effects of future State, 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.

Given the mixed nature of landownership in the Yuma resource planning area, cumulative effects would include those from recreation facilities, grazing, water developments by private interests, and urban and agricultural development.

### **Conclusion**

After reviewing the status of the bonytail chub in the action area, the species' range wide status, the effects of the proposed action, the cumulative effects of other Federal actions on the species, it is the Service's biological opinion that the proposed action as described is not likely to jeopardize the continued existence of the bonytail chub or result in the destruction or adverse modification of the species' critical habitat.

### **Incidental Take Statement**

The Service anticipates that incidental take of bonytail chub will be difficult to detect because of the difficulty in finding dead or impaired specimens in the water. Also, bonytail chub may be eaten by predator nonnative fish, and fisherman may not report bonytail they catch. However, incidental take of bonytail can be appropriately anticipated where a new BLM-authorized recreational facilities development renders bonytail suitable spawning habitat to an unsuitable condition along the shoreline of Lake Havasu. Therefore, the Service defines incidental in terms of this surrogate measure and expresses incidental take as maintenance of the current level of available bonytail spawning habitat in Lake Havasu over a period extending through the year 2007. This period includes the expected 20-years coverage of the comprehensive land management framework of the *Yuma District RMP*. Any decline in the amount of currently available suitable bonytail spawning habitat, as defined as areas over a clean, sandy bottom with reverse eddy currents, will exceed this level of incidental take. Most of Lake Havasu remains undeveloped and some suitable habitat remains.

### **Reasonable and Prudent Measures**

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of bonytail chub from future BLM actions under the direction of the Yuma RMP.

1. The BLM will assess remaining undeveloped suitable spawning habitat in Lake Havasu and will determine measures to reduce the amount of loss to bonytail spawning habitat from actions being taken under the direction of the Yuma RMP.
2. The BLM will further seek to educate the public who use and operate the recreational facilities along the Colorado River and within the Yuma resource planning area about the status and uniqueness of the bonytail chub.

## Terms and Conditions

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

In order to implement RPM # 1:

- The BLM will evaluate all lands within occupied bonytail habitat, under BLM management, and develop a strategy to eliminate or reduce adverse effects from BLM-authorized development to available spawning habitat along shorelines.

In order to implement RPM # 2:

- The BLM will continue to post signs at fishing access points at Lake Havasu and at tackle shops clearly advising anglers of the potential to take bonytail chub and how to report and release captured fish. This sign also should contain a clear photo of a bonytail chub that can be used by anglers to identify the species.
- The BLM will require that all BLM-authorized developments within the 100-year flood plain of the Colorado River in the Yuma planning area to post informational bulletins about the status and uniqueness of bonytail chub in conspicuous locations during the period of their operations. These bulletins will contain information regarding the threats to the bonytail chub; i.e., habitat alteration, and interactions with nonnative fishes.

## Reporting and monitoring requirements

The BLM shall monitor incidental take of bonytail chub within the Yuma planning area to ensure compliance with anticipated take as required by 50 CFR § 402.14(l)(3). The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If during the period of this action, this anticipated level of take is exceeded, such take would represent new information requiring review of the reasonable and prudent measures herein provided. The BLM 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.

## Conservation Recommendations

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the

agency's section 2(c) or 7(a)(1) responsibilities for bonytail chub. In furtherance of the purposes of the Act, the Service recommends implementing the following action:

1. The BLM should consider adding direction developed from the reasonable and prudent measures in this document for bonytail chub to the Yuma RMP when it is next amended, or to any future, comparable document that covers the resource planning area.

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 recommendation.

### RAZORBACK SUCKER (*XYRAUCHEN TEXANUS*)

#### **Status of the Species (Range Wide)**

##### Listing History

The razorback sucker was first proposed for listing under the Act on April 24, 1978, as a threatened species. The proposed rule was withdrawn on May 27, 1980, due to changes to the listing process included in the 1978 amendments to the Act.

In March, 1989, the Service was petitioned by a consortium of environmental groups to list the razorback sucker as an endangered species. The Service made a positive finding on the petition in June, 1989, that was published in the Federal Register on August 15, 1989. The finding stated that a status review was in progress and provided for submission of additional information through December 15, 1989. The proposed rule to list the species as endangered was published on May 22, 1990, and the final rule was published on October 23, 1991. The effective date of the rule was November 22, 1991. The final rule to designate critical habitat for the razorback sucker was published on March 21, 1994, with an effective date of April 20, 1994.

Critical habitat for the razorback sucker includes 15 reaches of the Colorado River system. These total 2,776 kilometers (1,724 mi) of river reaches. In the Upper Colorado River Basin, critical habitat is designated for portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan River. Portions of the Colorado, Gila, Salt, and Verde River are designated in the Lower Basin. Within the project area, critical habitat includes the Colorado River from Parker Dam to Imperial Dam (including Imperial Reservoir to its full pool elevation).

##### Species Description

The razorback sucker is the only representative of the genus *Xyrauchen* and was described from specimens taken from the "Colorado and New Rivers" (Abbott 1861) and Gila River (Kirsch 1889) in Arizona. This native sucker is distinguished from all others by the sharp edged, bony keel that rises abruptly behind the head. The body is robust with a short and deep caudal peduncle (Bestgen 1990). The razorback sucker may reach lengths of one

meter and weigh 5 to 6 kilograms (Minckley 1973). Adult fish in Lake Mohave reached about half this maximum size and weight (Minckley 1983). Razorback suckers are long-lived, reaching the age of at least the midforties (McCarthy and Minckley 1987).

### Life History

Life history information for the razorback sucker was recently summarized in the status review for the species (Bestgen 1990), in *Battle Against Extinction: Native Fish Management in the American West* (Minckley and Deacon 1991), and in the biological support document for critical habitat designation (USDI 1993). The life history information presented in this biological opinion is primarily taken from these sources.

The razorback sucker was once abundant in the Colorado River and its major tributaries throughout the Basin, occupying 3,500 mi of river in the United States and Mexico (USDI 1993). Records from the late 1800's and early 1900's indicated the species was abundant in the lower Colorado and Gila River drainages (Kirsch 1889, Gilbert and Scofield 1898, Minckley 1983, Bestgen 1990).

Adult razorback suckers utilize most of the available riverine habitats, although there may be an avoidance of white water type habitats. Main channel habitats used tend to be low velocity ones such as pools, eddies, near-shore runs, and channels associated with sand or gravel bars (summarized in Bestgen 1990). Backwaters, oxbows, and sloughs were well-used habitat areas adjacent to the main channel; flooded bottomlands are important in the spring and early summer (summarized in Bestgen 1990). Razorback suckers may be somewhat sedentary, however considerable movement over a year has been noted in several studies (USDI 1993). Spawning migrations have been observed or inferred in several locales (Jordan 1891, Minckley 1973, Osmundson and Kaeding 1989, Bestgen 1990, Tyus and Karp 1990).

Spawning takes place in the late winter to early summer depending upon local water temperatures. Various studies have presented a range of water temperatures at which spawning occurs. In general, temperatures between 10°-20°C are appropriate (summarized in Bestgen 1990). Spawning areas include gravel bars or rocky runs in the main channel (Tyus and Karp 1990), and flooded bottomlands (Osmundson and Kaeding 1989). There is an increased use of higher velocity waters in the spring, although this is countered by the movements into the warmer, shallower backwaters, and inundated bottomlands in early summer (McAda and Wydoski 1980, Tyus and Karp 1989, Osmundson and Kaeding 1989).

Habitat needs of larval razorback suckers are not well known. Warm, shallow water appears to be important. Shallow shorelines, backwaters, inundated bottomlands, and similar areas have been identified (Sigler and Miller 1963, Marsh and Minckley 1989, Tyus and Karp 1989, 1990, Minckley et al. 1991). For the first period of life, larval razorbacks are nocturnal and hide during the day. Diet during this period is mostly plankton (Marsh and Langhorst 1988, Papoulias 1988). Young fish grow fairly quickly with growth slowing once adult size is reached (McCarthy and Minckley 1987). Little is known of juvenile habitat preferences.

## Population Dynamics

The razorback sucker is adapted to the widely fluctuating physical environment of the historical Colorado River. Adults can live 45-50 years and, once reaching maturity between 2 and 7 years of age (Minckley 1983), apparently produce viable gametes even when quite old. The ability of razorback suckers to spawn in a variety of habitats, flows and over a long season are also survival adaptations. In the event of several consecutive years with little or no recruitment (due to either too much or too little water), the demographics of the population as a whole might shift, but future reproduction would not be compromised. Average fecundity recorded in studies ranged from 100,800 to 46,740 eggs per female (Bestgen 1990). With a varying age of maturity and the fecundity of the species, it would be possible to quickly repopulate after a catastrophic loss of adults.

The razorback sucker was listed as an endangered species due to declining or extirpated populations throughout the range of the species. The causes of these declines are changes to biological and physical features of the habitat. The effects of these changes have been most clearly noted by the almost complete lack of natural recruitment to any population in the historic range of the species. Populations are generally small and composed of aging individuals. A recovery plan is being drafted for this species. Recovery efforts under the Recovery Implementation Program in the Upper Basin have begun, but significant recovery results have not been achieved for this species. In the Lower Basin, efforts to reintroduce the species in the Gila, Salt and Verde rivers have not been successful in establishing self-sustaining populations. Reintroduction efforts are currently ongoing only in the Verde River. Augmentation efforts along the Lower Colorado River propose to replace the aging populations in Lakes Havasu and Mohave with young fish from protected rearing site programs. This may prevent the imminent extinction of the species in the wild, but appears less capable of ensuring long-term survival or recovery. Overall, the status of the razorback sucker in the wild continues to decline.

Razorback suckers were key components of the sparse fish fauna that historically occupied the Lower Colorado River. Spawning and nursery areas were provided largely during spring floods that provided space, food, and protection during early life stages of both species. Initiation of spawning was tied closely to the hydrologic cycle of the river. As flows rose and began to create nursery habitat, spawning occurred. Ample space and food was provided for the young fish.

Conversely, clear water impoundments provided ideal habitat for a variety of nonnative fish. Impoundments and severely modified flows interrupted this creation of habitat critical for survival. Nonnative fish were introduced and rapidly became established throughout most of the Lower Basin. Nonnatives were effective competitors and predators on native fish. As a result, essentially all the native fish species are either listed as threatened or endangered or their numbers have decreased significantly.

### **Status of the Species (In the Action Area)**

Within the Yuma resource planning area, designated critical habitat for the razorback sucker includes the Colorado River and its 100-year flood plain from Parker Dam to Imperial Dam,

including Imperial Reservoir to the greater of the pool elevation or the 100-year flood plain. In the last 100 years, the Colorado River has been highly altered by dams, and impoundments, water diversions, and channelization projects that have altered water flow and greatly reduced or eliminated seasonal flooding. Flood plains have been separated from the River by the construction of levees and have been converted to urban uses or agriculture. Warm, sediment-laden water now enters the impounded reservoirs while cold, clear water is released at the dams. Temperature and turbidity of the Colorado River are affected for long stretches below the dams. Agricultural, industrial, and municipal uses have increased the salinity of the River, affected water quality, and introduced pesticides and other contaminants. Historic habitats have been reduced and fragmented. The physical changes in the environment have favored the successful competition of nonnative fish over the native species. Nonnative fishes preying on the native fish, particularly the early life stages, have eliminated any successful recruitment into adult populations.

Like the bonytail chub, the razorback sucker continues to persist in Lake Havasu in limited numbers. Adults and juveniles have been documented in several locations along the Colorado River and have been periodically stocked into Senator's Wash Reservoir and other locations in the Imperial Division. Although limited recruitment of juveniles into some of these populations may be occurring, it is not enough for a self-sustaining population. The BLM is cooperating with the Service and other agencies to stock razorback suckers into protected environments in Lake Havasu. Stocking efforts also are currently ongoing at Imperial Division and Cibola National Wildlife Refuge. In 1996, the Service captured five razorback suckers from the Bill Williams arm of Lake Havasu.

### **Effects of the Action**

The biological evaluation includes determinations that some of the RMP actions affect aquatic habitats in the Colorado River. The effects of these actions are guided by the decisions of the Yuma RMP and are analyzed by program area in this documents. Codes such as WF-9 in the text refer to specific RMP management action identified in the biological evaluation. Program areas not discussed below have insignificant, discountable, or no effect on the species.

### **Recreation Management in Flood Plains**

Management action R-7 is directed at retention of lands in or adjacent to the 100-year flood plain in Federal ownership so that public opportunities for Colorado River recreation continue to be available in the future. Although public access to the Colorado River could result in impacts to razorback sucker and critical habitat through increased public access to waterways, the ability of the BLM to regulate and manage public access is not expected to increase impacts to razorback sucker.

### **Lands**

Management activity L-15 provides for the retention of agricultural lands along the Colorado River in Federal ownership. The ultimate disposition of these lands is to be determined following further analysis, including delineation of the 100-year flood plain. Agricultural use of suitable razorback spawning areas along shorelines could result in

impacts to the razorback sucker, although the retention of the lands under Federal authority will allow the BLM to maintain management authority of the lands along the Colorado River.

### Recreation Management

Management activity R-9 allows only permanent new facilities that can be flood proofed to remain on the 100-year flood plain. Existing permanent structures are allowed to remain until they are inundated, their useful life is gone, or the present lease expires. Restricting new structures to flood proofing, and reducing the numbers of existing structures that are not flood proofed also are not expected to increase impacts to razorback sucker and the species' habitat.

Management activities R-10 and R-11 allow short-term camping on the 100-year flood plain during periods of normal water levels and long-term winter camping within concession areas.

R-15 allows the continued lease of recreation areas for concession State park and county operation and allows private enterprise to provide services and facilities that are responsive to public needs. Management activity R-20 involves the review of existing leases as they come up for renewal. The activity also allows for extensions or modification of existing leases in conformity with the RMP or with public needs. Also, R-5 and R-16 allow for the expansion of recreational facilities. Any activity that expands recreational fishing would increase the probability that fishermen would take or capture razorback sucker, as well as introduce nonnative fish to the system. Also, expanded facilities along the Colorado River could result in reduced water quality in the species' habitat. At Lake Havasu and in the Imperial Division, the BLM has posted signs providing instructions for reporting captured razorback sucker.

### Cumulative Effects

Cumulative effects include the effects of future State, 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.

Given the mixed nature of landownership in the Yuma resource planning area, cumulative effects would include those from grazing, recreation facilities, water developments by private interests, and urban and agricultural development.

### Conclusion

After reviewing the status of the razorback sucker in the action area, the species' range wide status, the effects of the proposed action, the cumulative effects of other Federal actions on the species, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the razorback sucker or result in the destruction or adverse modification of the species' critical habitat.

### **Incidental Take Statement**

The Service anticipates that incidental take of razorback sucker also will be difficult to detect because of the difficulty in finding dead or impaired specimens in the water. Like bonytail chub, razorback suckers may be eaten by predatory non-nonnative fish, and fisherman may not report individuals they catch. However, incidental take of razorback sucker can be anticipated where a new BLM-authorized recreational facilities development along the shoreline of Lake Havasu renders habitat that is suitable for restocking efforts unsuitable. Therefore, the Service defines incidental take in terms of this surrogate measure and expresses incidental take as maintenance of the current level of known razorback sucker suitable habitat in the shoreline environments of Lake Havasu. Any decline in the amount of currently available suitable habitats, will exceed this level of incidental take. Most of Lake Havasu remains undeveloped and some suitable habitat remains.

### **Reasonable and Prudent Measure**

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of razorback sucker from future BLM activities under the direction of the Yuma RMP:

1. BLM will assess remaining undeveloped suitable spawning habitat in Lake Havasu and will determine measures to reduce the amount of loss to razorback sucker spawning habitat from actions being taken under the direction of the Yuma RMP.
2. BLM will further seek to educate the public who use and operate the recreational facilities along the Colorado River and within the Yuma resource planning area about the status and uniqueness of the razorback sucker.

### **Terms and Conditions**

In order to be exempt from the prohibitions of Section 9 of Act, the BLM must comply with the following terms and conditions, that implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

In order to implement RPM # 1:

- The BLM will evaluate all remaining undeveloped suitable razorback sucker habitat under BLM management, and develop a strategy to eliminate or reduce adverse effects from BLM-authorized development to this habitat along shorelines.

In order to implement RPM # 2:

- The BLM will continue to post signs at fishing access points at Lake Havasu and in the Lake Imperial Division at tackle shops clearly advising anglers of the potential to take razorback suckers and how to report and release captured fish. This sign also should contain a clear photo of a razorback sucker that can be used by anglers to identify the species.

- The BLM will require that all BLM-authorized developments within the 100-year flood plain of the Colorado River in the Yuma planning area to post informational bulletins about the status and uniqueness of the razorback sucker in conspicuous locations during the period of their operations. These bulletins will contain information regarding the threats to the razorback sucker; i.e., habitat alteration, and interactions with nonnative fishes.

#### Reporting and monitoring requirements

The BLM shall monitor incidental take of razorback sucker within the Yuma planning area to ensure compliance with anticipated take as required by 50 CFR § 402.14(l)(3). The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If during the period of this action, the level of anticipated take is exceeded, such take would represent new information requiring review of the reasonable and prudent measures herein provided. The BLM 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.

#### Conservation Recommendations

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for razorback sucker. In furtherance of the purposes of the Act, the Service recommends implementing the following action:

1. The BLM should consider adding direction developed from the reasonable and prudent measures in this document for razorback sucker to the Yuma RMP when it is next amended, or to any future, comparable document that covers the resource planning area.

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 recommendation.

#### DESERT TORTOISE (*GOPHERUS AGASSIZII*) (MOHAVE POPULATION)

##### **Status of the Species (Range Wide)**

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered. In a final rule dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened. The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts, and in Sonora and northern Sinaloa, Mexico. The threatened Mojave

population is found in California, Nevada, and north of the Colorado River in northwestern Arizona and southwestern Utah. Desert tortoises of the Mojave population are most active during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and after infrequent summer monsoons. Desert tortoises spend the remainder of the year in burrows, escaping the extreme weather conditions of the desert.

The desert tortoise is threatened by numerous factors, most of which are human caused. These factors include destruction, degradation, and fragmentation of desert tortoise habitat resulting from habitat conversion to urban or agricultural development, construction of roads, mining, sheep and cattle grazing, and other activities; direct mortality or removal of animals from populations due to collecting and road kills; and mortality due to an upper respiratory tract disease (URTD), particularly in the western Mojave Desert. Fire is an increasingly important threat to desert tortoise habitat. Over 500,000 acres of desert lands burned in the Mojave Desert in the 1980's. Fires in Mojave Desert scrub degrade or eliminate habitat for desert tortoises.

The recovery plan for the Mojave population of the desert tortoise (USDI 1994) proposes the establishment of 14 Desert Wildlife Management Areas (DWMA) in six recovery units. Land management in DWMA would target the reduction or elimination of those factors that have caused declines in desert tortoise populations. The boundaries of proposed DWMA are not precisely defined in the recovery plan, but would be established by the Bureau of Land Management, Department of Defense, National Park Service, and other land management agencies in coordination with the Service, State wildlife agencies, and others. The proposed Quien Sabe West Quarry is within the boundaries of an area being considered for designation as the Chuckwalla DWMA in the Northern and Eastern Colorado Desert Coordinated RMP (Kirk Waln, Fish and Wildlife Service, Ventura, CA, pers. comm. 1996). The Manchester Quarry is located just east of the proposed Fenner DWMA. The other quarries are not located in or near areas proposed as DWMA.

The Service designated critical habitat for the Mojave population of the desert tortoise in a Federal Register notice dated February 8, 1994 (59 FR 5820-5846, also see corrections at 59 FR 9032-9036). None of the existing or proposed quarries, haul roads or routes, or stockpiles addressed in this consultation are located in critical habitat.

Further information on the range, biology, and ecology of the desert tortoise can be found in Luckenbach (1982), Turner et al. (1984), Weinstein et al. (1987), Ernst et al. (1994), various papers by J.R. Spotila and others in *Herpetological Monographs* published June 30, 1994, various papers in Bury and Germano (eds.) (1994), and Service (1994).

#### **Status of the Species (In the Action Area)**

The listed Mojave Population of the desert tortoise occurs only within the California portions of the Yuma District. Desert tortoise habitat in the Yuma District was categorized in 1992. Within the California portion of the planning area, three habitat areas have been categorized. The Palo Verde Foothills is in a Category III area and totals 9,622 acres. Big Maria Mountains is a Category II area and totals 7,232 acres. Crossroads is a Category III area totaling 3,170 acres and is located adjacent to the Parker Strip in the foothills of the

Whipple Mountains. Habitat categories are based on field surveys and transects conducted in potential, suitable, or known desert tortoise habitat. Although tortoises or their sign are occasionally found outside of categorized habitat, noncategorized areas are not considered to contain habitat features suitable to support viable populations of desert tortoise.

Typical Mojave desert tortoise habitat in the planning area includes mountain foothills and relatively flat alluvial fans outside of the Colorado River flood plain. Most tortoise sign has been found on slopes of less than 30 percent. BLM estimated relative densities of tortoise within two of the habitat areas in 1989, based on the number of sign encountered while walking 3-mi strip transects. Relative population densities were estimated to be 10 to 24 tortoises per square mi in the Palo Verde Foothills and 32 to 55 tortoises per square mi in the Big Maria Mountains. Thirty-nine mi of transects walked in the Crossroads area between 1989 and 1991 yielded a population density estimate of 12 tortoises per square mi.

Agnes Wilson, Quien Sabe West, Big Maria No. 2, and Palo Verde quarry sites and haul routes, and stockpiles C-134.0, C-138.0, and C-151.0 are located within the lower Colorado River subdivision of Sonoran desert scrub. This is the largest and most arid subdivision of the Sonoran Desert. Mean annual precipitation varies from about 3.2 inches at Blythe to 4.5 inches at Needles. Vegetation communities are typically open and simple (Turner and Brown 1982). The Manchester Quarry is located near the southern limit of the creosote bush series of Mojave desert scrub (Turner 1982). Vegetation communities at this site share many species with and are similar to other quarry sites in Sonoran desert scrub (CH2MHILL 1996).

In bajadas, through which haul routes pass, creosote, *Larrea tridentata*; cat claw, *Acacia greggii*; and teddy bear cholla, *Opuntia bigelovii* are dominant. Vegetation diversity increases on the slopes, where no species are dominant. Drainages at and near quarry sites support species such as desert lavender, *Hyptis emoryi*; chuckwalla's delight, *Bebbia juncea*; blue palo verde, *Cercidium floridum*; and creosote (CH2MHILL 1996). The Palo Verde Quarry is on the edge of the Colorado River flood plain. Riparian species, particularly saltcedar, *Tamarix chinensis*, occur on the southern and eastern edges of the site.

Habitats at existing quarries, haul roads, and stockpiles are heavily disturbed due to past and ongoing activities. Disturbance is variable adjacent to project features, but in rocky terrain adjacent habitats are relatively undisturbed. Further descriptions of habitats can be found in, Turner (1982), and Turner and Brown (1982).

### Effects of the Action

The effects of activities guided by the decisions, terms, and conditions of the Yuma RMP are analyzed by project area. Codes such as WF-9 in the text refer to specific RMP direction identified in the biological evaluation.

### Wild Horse and Burro Program

Burros may compete with tortoises for forage and alter the vegetative composition of tortoise habitat. Wild burros occur in the Palo Verde Mountains and are managed in this

area under the Cibola-Trigo Herd Management Plan. Although burros may occur in desert tortoise habitat, most burro use in this area is along the riparian zone of the Colorado River or in washes that serve as travel corridors through the mountain range. Decisions in the Yuma District RMP related to burros deal only with access to water and the effect of water developments on expansion of wild horse and burro herds (WHB-1 and WHB-2). The Cibola-Trigo Herd Management Plan identified the herd management area boundary and set management levels for wild horses and burros in this area. The BLM has indicated that this plan will be revised pending updated population censuses and vegetation monitoring for the herd management area.

### Lands

Direction in the RMP, with its March 1996 amendment, governs land disposal, acquisition, and exchanges. Acquisition and consolidation of landownership could have beneficial effects on the tortoises. Land disposal or exchanges could have adverse effects if they result in net loss of tortoise habitat. The RMP provides that any land identified for disposal must be evaluated for significant threatened and endangered species resources before transfer of land is completed. The L-7 states that it is District policy to not dispose of lands occupied by listed or proposed threatened or endangered species.

Activities under lands also include authorizations for utility corridors, communication sites, and rights-of-way. Limiting rights-of-way and communication facilities to existing corridors and sites may limit the increase of impacts, but it is not clear that any continuing impacts to tortoises have been evaluated or eliminated.

### Recreation

Most activities occurring in desert tortoise (Mojave population) habitat in the Yuma District are associated with recreation. Off-road use continues in several of these areas. The RMP limits most off-road vehicle use to existing roads and trails. The BLM is implementing terms and conditions of the Service's biological opinion (1-8-93-F-3) on the Parker Strip Recreation Area Management Plan, which includes the Crossroads area. R-5 and R-16 require consideration of natural values in expansion of recreational facilities and programs.

### Minerals Management

Mining activities under Minerals Management can result in surface-disturbing activities within tortoise habitat. The only RMP direction related to Minerals Management directs the Yuma district to coordinate with the Bureau of Reclamation to locate and preserve adequate permanent material sites for levee and revetment work along the Colorado River. The Manchester, Agnes Wilson, Quien Sabe West, Big Maria No. 1 and 2 Quarries are within lands managed by the BLM-California Desert District, although a portion of their haul roads do fall within the Yuma Field Office area. Palo Verde Quarry and associated haul routes, and stockpiles C-134.0, C-138.0, and C-151.0 are located within the planning area. Habitats at existing quarries, haul roads, and stockpiles are heavily disturbed due to past and ongoing activities. Disturbance is variable adjacent to project features, but in rocky terrain adjacent habitats are relatively undisturbed.

### Other Program Areas

Activities under Wildlife and Fisheries; Range; Cultural Resources; Soil, Water, and Air Resources; Fire Management; Vegetation Management; Wilderness; and Special Management Areas are likely to have beneficial effects for the desert tortoise and its habitat or to have no effect.

### Cumulative Effects

Cumulative effects include the effects of future State, 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.

Given the scattered pattern of BLM lands, cumulative effects may be expected from continuing recreational, commercial, and agricultural use of adjacent private lands. Private holdings may also support burros, and thereby contribute to maintaining burro populations within the action area.

### Conclusion

After reviewing the current status of the desert tortoise (Mojave population), the environmental baseline for the action area, the effects of the proposed action, and available information on cumulative effects, it is the Service's biological opinion that continuation of management direction in the RMP is not likely to jeopardize the continued existence of the desert tortoise. Because no critical habitat for the tortoise has been proposed within the area affected by the Yuma RMP, the proposed action would not destroy or adversely modify critical habitat.

Tortoises occur within the planning area at relatively low densities and represent the extreme eastern edges of the Northern Colorado and Southern Colorado recovery units. The BLM land classifications within the RMP provide for special consideration in management of tortoises. The limited impacts expected within the planning area would not compromise the integrity of either recovery unit.

### Incidental Take Statement

Sections 4(d) and 9 of the Act, 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 nondiscretionary, 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 BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM (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 incidental take of desert tortoises will be difficult to detect for the following reason: Take is likely to be low levels and distributed over a wide area. The probability is low that the deaths of a few tortoises over such a wide area could be attributed to any particular BLM activity in the planning area. The Service is therefore defining the anticipated level of take in terms of the number of dead tortoises found along BLM roads and trails in the California portion of the planning area during routine travel and patrolling activities by BLM personnel. The Service anticipates that this number will be 50 tortoises for the remaining years of the planning period (up to 20 years from the adoption of the Yuma District RMP in 1987).

In the accompanying biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the species.

#### Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take: Reduce the likelihood of tortoise deaths from projects and vehicular traffic.

#### Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the Act, the BLM 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 implement the reasonable and prudent measure above. These generic terms and conditions should be adapted and applied to projects that may affect the desert tortoise (Mojave population):

##### ***Priority 1: Avoid the Impacts***

- To the extent possible, project features shall be located in previously disturbed areas or outside of desert tortoise habitat.

*If impacts to desert tortoises or their habitat can not be avoided, then:*

**Priority 2: Minimize the Impacts**

**a. Scheduling Activities to Reduce Potential Adverse Effects:**

- To the extent possible, project activities shall be scheduled when tortoises are inactive (typically November 1 to March 1).

**b. Information and Education of Project Personnel:**

A desert tortoise protection education program shall be presented to all employees, inspectors, supervisors, contractors, and subcontractors who carry out proposed activities at the project site. The education program shall include discussions of the following:

- (1) The legal and sensitive status of the tortoise;
- (2) A brief discussion of tortoise life history and ecology;
- (3) Mitigation measures designed to reduce adverse effects to tortoises; and
- (4) Protocols to follow if a tortoise is encountered, including appropriate contact points.

**c. Designation of a Desert Tortoise Coordinator:**

The project proponent shall designate a field contact representative (FCR) who shall be responsible for overseeing compliance with these terms and conditions and for coordination on compliance with the Service. The FCR and authorized/qualified biologist(s) shall have the authority and the responsibility to halt all project activities that are in violation of these terms and conditions. The FCR shall be responsible for oversight of compliance with these terms and conditions, coordination with permitting agencies, land managers, and State Game and Fish Departments; and shall serve as a contact point for personnel that encounter desert tortoises. The FCR shall be on site during project activities and shall be familiar with and have a copy of these terms and conditions.

**d. Preconstruction Surveys:**

Prior to any surface-disturbing activities, work sites shall be surveyed for desert tortoises by a qualified biologist approved by the action agency (a qualified biologist should be an individual trained to conduct tortoise surveys). Surveys shall be in accordance with Service protocol (Service 1992). For surface-disturbing activities occurring during the desert tortoise season (March 1 through November 1), surveys shall be conducted within 24 hours of initiation of surface-disturbing activities. Between November 1 and March 1 any new disturbance shall be preceded by surveys conducted within one week of the proposed activities. The 100-percent surveys of new areas of disturbance shall be conducted a maximum of three times, or two consecutive times if no desert tortoises are found. During surveys, occupied desert tortoise burrows in or within 40 feet of areas to be disturbed shall be excavated using hand tools by an

authorized biologist. Burrows discovered in areas to be disturbed by project activities shall be collapsed or blocked to prevent entry by tortoises (any tortoises in those burrows shall be relocated first). Desert tortoises and any desert tortoise eggs found in areas to be disturbed shall be relocated and handled in accordance with the following measure.

**e. Moving of Desert Tortoises out of Harm's Way:**

- (1) If a tortoise is found in a project area, activities should be modified to avoid injuring or harming it. If activities cannot be modified, tortoises shall be moved from harm's way. Upon discovery of a desert tortoise in harm's way, the authorized biologist shall translocate the animal the minimum distance possible (but not more than 2 mi) within appropriate habitat to ensure its safety from death, injury, or collection associated with the project or other activities. The authorized biologist shall be allowed some discretion to ensure that survival of each relocated desert tortoise is likely. Desert tortoises shall not be translocated to lands outside the administration of the Federal government without the written permission of the landowner.

Handling procedures for desert tortoises and their eggs shall adhere to protocols outlined in Desert Tortoise Council (1994/1996 revisions - Appendix 1).

- (2) Only biologists authorized by the Service and the appropriate State Fish and Game Department shall handle desert tortoises. Reclamation shall submit the name(s) of the proposed authorized biologist(s) to the Service for review and approval at least 15 days prior to the onset of activities that could result in a take.
- (3) The authorized biologist shall maintain a record of all desert tortoises encountered during project activities. This information shall include for each desert tortoise:
  - The locations and dates of observation;
  - General condition and health, including injuries and state of healing and whether animals voided their bladders;
  - Location moved from and location moved to; and
  - Diagnostic markings; i.e., identification numbers of marked lateral scutes).

No notching of scutes or replacement of fluids with a syringe is authorized.

- (4) Desert tortoises that are handled shall be marked for future identification. An identification number (using the acrylic paint/epoxy technique) shall be placed on the 4th costal scute (USDI 1992).

**f. Minimization of Project Footprint:**

- (1) Vehicle use shall be limited to existing or designated routes to the extent possible.
- (2) Areas of new construction or disturbance shall be flagged or marked on the ground prior to construction. All construction workers shall strictly limit their activities and vehicles to areas that have been marked. Construction personnel shall be trained to recognize markers and understand the equipment movement restrictions involved.

**g. Limitation of Habitat Disturbance within the Project Footprint:**

- (1) Blading of new access or work areas shall be minimized to the extent possible. Disturbance to shrubs shall be avoided if possible. If shrubs cannot be avoided during equipment operation or vehicle use, wherever possible, they shall be crushed rather than excavated or bladed and removed.
- (2) Project features that might trap or entangle desert tortoises such as open trenches, pits, open pipes, etc., shall be covered or modified to prevent entrapment. [This may only be necessary during the tortoise active season and may be unnecessary if an on-site biologist is monitoring activities - see "Suggested Mitigation Measures for Projects Conducted During the Tortoise Activity Period..." below.]

**h. Preventing Attraction of Predators or Enhancement of Predator Populations:**

Construction sites shall be maintained in a sanitary condition at all times. The project proponent shall be responsible for controlling and limiting litter, trash, and garbage by immediately placing refuse in predator-proof, sealable receptacles. Trash and debris shall be removed when construction is complete.

***Priority 3: Rectify the Impacts***

**a. Removal of Hazards:**

After completion of the project, trenches, pits, and other features in which tortoises could be entrapped or entangled, shall be filled in, covered, or otherwise modified so they are no longer a hazard to desert tortoises.

**b. Habitat Restoration:**

After project completion, measures shall be taken to facilitate restoration. Restoration techniques should be tailored to the characteristics of the site and the nature of project impacts identified in the mitigation plan as developed by project biologists, Arizona Game and Fish Department, and permitting State and Federal agencies. Techniques may include removal of equipment and debris,

recontouring, replacing boulders that were moved during construction; and seeding, planting, transplanting of cacti and yuccas, etc. Only native plant species, preferably from a source on or near the project area, should be used in restoration.

***Priority 4: Reduce or Eliminate the Impacts over Time, and Provide Guidance and Information for Improving Future Mitigation Plans***

**Monitoring and Reporting Requirements:**

The project proponent shall submit a monitoring report to the Service within 90 days of project completion. For long-term or ongoing projects that may result in continuing impacts to tortoises and habitat, annual monitoring reports shall be prepared. Monitoring reports shall briefly document the effectiveness of the desert tortoise mitigation measures, actual acreage of desert tortoise habitat disturbed, the number of desert tortoises excavated from burrows, the number of desert tortoises moved from construction sites, and other applicable information on individual desert tortoise encounters. The report shall make recommendations for modifying or refining the mitigation program to enhance desert tortoise protection and reduce needless hardship on the project proponents.

Project Proponents/Agencies should be encouraged to include this in their project description. BLM is obligated to do so through an agreement with the Service and State Game and Fish agencies:

***Priority 5: Compensate for Residual Impacts***

In accordance with "Compensation for the Desert Tortoise" (Desert Tortoise Compensation Team 1991), signed by Desert Tortoise Management Oversight Group, authorizing agencies shall require compensation for residual impacts to desert tortoise habitat.

*The following mitigation measures are designed for specific project types or conditions. Most act to minimize project impacts (priority 2 measures).*

**For Projects Involving Hazardous Materials:**

Oil, fuel, pesticides, and other hazardous material spills shall be cleaned up and properly disposed of as soon as they occur in accordance with applicable State and Federal regulations. All hazardous material spills must be reported promptly to the appropriate surface management agencies and hazardous materials management authorities.

**For Projects Conducted During Tortoise Activity Period (typically March 1 to November 1):**

1. Construction and operation activities shall be monitored by a qualified desert tortoise biologist (approved by the action agency). The biologist shall be present during all activities in which encounters with tortoises may occur. The biologist shall watch for tortoises wandering into construction areas, check under vehicles,

check at least three times per day any excavations that might trap tortoises, and conduct other activities necessary to ensure that death and injury of tortoises is minimized.

2. Unleashed dogs shall be prohibited in project areas.
3. Temporary fencing, such as chicken wire, snow fencing, chain link, and other suitable materials shall be used in designated areas to reduce encounters with tortoises on short-term projects, such as construction of power lines, burial of fiber optic cables, etc., where encounters with tortoises are likely.
4. Workers shall check under vehicles for desert tortoises before vehicles are moved. If tortoises are found, they shall be allowed to move out of harm's way on their own or shall be moved by an authorized biologist prior to moving the vehicle.

For Long-term or Permanent Projects in Which Continued Encounters with Desert Tortoises Are Expected:

Construction of schools, factories, power plants, office buildings, and other permanent or long-term projects in moderate to high density desert tortoise habitat shall be enclosed with desert tortoise barrier fencing to prevent tortoises from wandering onto the project site where they may be subject to collection, death, or injury. Barrier fencing shall consist of wire mesh with a maximum mesh size of 1-inch (horizontal) by 2-inch (vertical) fastened securely to posts. The wire mesh shall extend at least 18 inches above the ground and preferably 12 inches below the surface of the ground. Where burial is not possible, the lower 12 inches shall be folded outward, away from the enclosed site, and fastened to the ground so as to prevent tortoise entry. Any gates or gaps in the fence shall be constructed and operated to prevent desert tortoise entry (such as installing "tortoise guards" similar to cattle guards, and/or keeping gates closed). Specific measures for tortoise-proofing gates and gaps shall be addressed project by project. Fencing is a relatively expensive mitigation measure and may not be appropriate in areas of very low tortoise density.

For Projects in Which Encounters Between Vehicles and Tortoises are Likely:

In desert tortoise habitat project-related vehicles shall not exceed 25 mi per hour on unpaved roads.

For Road and Railroad Construction or Improvements in Desert Tortoise Habitat:

1. New paved roads and highways or major modifications of existing roads through desert tortoise habitat shall be fenced with desert tortoise barrier fencing (described above). Culverts, to allow safe passage of tortoises, shall be constructed approximately every mi of new paved roads and railroads (culverts can also serve the more typical purpose of conducting water under roads and railroads). The culvert diameter needed to encourage tortoise use is correlated with culvert length, but generally short culverts of large diameter are most likely to be used. Culvert design shall be coordinated with Arizona Game and Fish Department and authorizing State

and Federal agencies. The floor of the culvert shall be covered with dirt and maintenance shall be performed as necessary to maintain an open corridor for tortoise movement.

2. Use of roads constructed for specific nonpublic purposes such as access routes to microwave towers shall be limited to administrative use only.
3. Temporary access routes created during project construction shall be modified as necessary to prevent further use. Closure of access routes could be achieved by ripping, barricading, posting the route as closed, and/or seeding and planting with native plants.

The following term and condition implements reasonable and prudent measure 2:

2. Evaluate the level of burro impacts to desert tortoise habitat and take measures to exclude burros where such impacts occur.

The reasonable and prudent measures, with their implementing terms and conditions are designed to minimize incidental take that might otherwise result from the proposed action.

The Service is defining the anticipated level of take in terms of the number of dead tortoises found along BLM roads and trails in the California portion of the planning area during routine travel and patrolling activities by BLM personnel. With the implementation of these measures, the Service anticipates that this number will be 50 tortoises for the remaining years of the planning period (up to 20 years from the adoption of the Yuma District RMP in 1987). If, during the course of the action, this minimized 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.

### **Conservation Recommendations**

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for desert tortoise. In furtherance of the purposes of the Act, the Service recommends implementing the following action:

1. The BLM should consider including the appropriate elements of the reasonable and prudent measures identified in the Incidental Take Statement as amendments to the RMP for the planning area.

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 recommendation.

## INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the Act, 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, and 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.

Anticipated levels of incidental take, if any, along with applicable reasonable and prudent measures, are provided within the affected species accounts.

## REINITIATION STATEMENT

This concludes formal consultation on the action described in your request. As provided by 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (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 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.

cc: Arizona State Director, Bureau of Land Management, Phoenix, AZ  
Chief, Division of Endangered Species, Washington, D.C.  
Regional Director, Region 1  
Geographic Manager, Arizona, Region 2  
Chief, Ecological Services, Region 2  
✓ Supervisors, Ecological Services Field Offices, Albuquerque, NM and Phoenix, AZ  
Steve Chambers and Ron McClendon, Ecological Services, Region 2, Albuquerque, NM

**BIBLIOGRAPHY**

- Abbott, C.C. 1861. Descriptions of four new species of North American Cyprinidae. Proceedings of the Philadelphia Academy of Natural Sciences 12(1860):473-474.
- Allan, R.C., and D.L. Roden. 1978. Fish of Lake Mead and Lake Mohave. Biological Bulletin Number 7. Nevada Department of Wildlife, Reno. 105 pp.
- Baird, S. F., and C. Girard. 1853. Descriptions of new species of fishes collected by Mr. John H. Clark, on the U.S. and Mexican Boundary Survey, under Lt. Col. Jas. D. Graham. Proc. Acad. Nat. Sci. Philadelphia 6:387-390.
- Bestgen, K.R. 1990. Status review of the razorback sucker, *Xyrauchen texanus*. Colorado State Univ. Larval Fish Laboratory, Contribution 44, Ft. Collins, Colorado. 92 pp.
- Bury, R.B., and D.J. Germano (eds.). 1994. Biology of North American Tortoises. National Biological Survey, Fish and Wildlife Research 13.
- Circle Mountain Biological Consultants. 1996. Federal biological opinion analysis for the proposed Eagle Mountain Landfill Project. Prepared for CH2MHILL, Santa Ana, California.
- Desert Tortoise Compensation Team. 1991. Compensation for the desert tortoise. Report to the Desert Tortoise Management Oversight Group.
- Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington D.C.
- Gilbert, C. H., and N. B. Scofield. 1898. Notes on a collection of fishes from the Colorado Basin in Arizona. Proc. U.S. Natl. Mus. 20:487-499.
- Hunter, W.C. 1988. Use of exotic saltcedar (*Tamarix chinensis*) by birds in arid riparian systems. Condor 90:113-123.
- Hunter, W.C., B.W. Anderson, and R.D. Ohmart. 1987. Avian community structure changes in a mature flood plain forest after extensive flooding. Journal of Wildlife Management 51:495-502.
- Jonez, A., and R.C. Sumner. 1954. Lakes Mead and Mohave investigations: a comparative study of an established reservoir as related to a newly created impoundment. Final Report Federal Aid Project F-1-R. Nevada Fish and Game Commission, Reno.
- Jordan, D.S. 1891. Report of explorations in Colorado and Utah during the summer of 1889 with an account of the fishes found in each of the river basins examined. Bulletin of the United States Fish Commission 9:24.

- Kirsch, P.H. 1889. Notes on a collection of fishes obtained in the Gila River at Fort Thomas, Arizona. Proceedings of the U.S. National Museum 11:555-558.
- Luckenbach, R.A. 1982. Ecology and management of the desert tortoise (*Gopherus agassizii*) in California. Pages 1-37 in North American Tortoises: Conservation and Ecology. R.B. Bury (ed.). Fish and Wildlife Service. Wildlife Research Report 12.
- Marsh, P.C. and D.R. Langhorst. 1988. Feeding and fate of wild larval razorback sucker. Environmental Biology of Fishes 21:59-67.
- Marsh, P.C., and W.L. Minckley. 1989. Observations on recruitment and ecology of razorback sucker: Lower Colorado River, Arizona-California-Nevada. Great Basin Naturalist 49, 71-78.
- McAda, C.W., and R.S. Wydoski. 1980. The razorback sucker, *Xyrauchen texanus*, in the upper Colorado River basin, 1974-76. U.S. Fish and Wildlife Service Tech. Paper 99. 50 pp.
- McCarthy, C.W., and W.L. Minckley. 1987. Age estimation for razorback sucker (Pisces: Catostomidae) from Lake Mohave, Arizona and Nevada. Journal of the Arizona-Nevada Academy of Science 21:87-97.
- Miller, R.R. 1961. Man and the changing fish fauna of the American southwest. Papers of the Michigan Academy of Science, Arts, and Letters XLVI:365-404.
- Minckley, W. L. 1973. The fishes of Arizona. Arizona Game and Fish Dept., Phoenix. 293pp.
- Minckley, W.L. 1983. Status of the razorback sucker, *Xyrauchen texanus* (Abbott), in the lower Colorado River basin. The Southwestern Naturalist 28(2):165-187.
- Minckley, W.L. 1985. Native fishes and natural aquatic habitats in the U.S. Fish and Wildlife Service Region II west of the continental divide. Arizona State University, Tempe, AZ. 158 pp.
- Minckley, W.L., and J.E. Deacon. 1968. Southwestern fishes and the enigma of "endangered species." Science 159:1424-1432.
- Ohmart, R.D., B.W. Anderson, and W.C. Hunter. 1988. The ecology of the lower Colorado River from Davis Dam to the Mexico-United States International Boundary: A community profile. U.S. Fish and Wildlife Service Biological Report 85(7.19) pp. 296.
- Osmundson, D.B., and L.R. Kaeding. 1989. Studies of Colorado squawfish and razorback sucker use of the "15-mi reach" of the Upper Colorado River as part of conservation measures for the Green Mountain and Ruedi Reservoir water sales. Final Report, U.S. Fish and Wildlife Service, Region 6. Grand Junction, Colorado. 81 pp.

- Papoulias, D. 1988. Survival and growth of larval razorback sucker, *Xyrauchen texanus*. Master's thesis. Arizona State University, Tempe.
- Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. Birds of the Lower Colorado River Valley. University of Arizona Press, Tucson. 416 pp
- Sigler, W.F., and R.R. Miller. 1963. Fishes of Utah. Utah Department of Fish and Game, Salt Lake City. 203 pp.
- Tibbitts, T.J., M.K. Sogge, and S.J. Sferra. 1994. A survey protocol for the Southwestern willow flycatcher (*Empidonax traillii extimis*). Technical report NPS/NAUCPRS/NRTR-94/04. National Park Service, Colorado Plateau Research Station at Northern Arizona University, Flagstaff, Arizona.
- Turner, F.B., P.A. Medica, and C.L. Lyons. 1984. Reproduction and survival of the desert tortoise (*Scaptochelys agassizii*) in Ivanpah Valley, California. *Copeia* 1984(4):811-820.
- Turner, R.M. 1982. Mohave desertscrub. Pages 157-168 *in* Biotic communities of the American Southwest - United States and Mexico. D.E. Brown (ed). Desert Plants 4 (1-4).
- Turner, R.M., and D.E. Brown. 1982. Sonoran desertscrub. Pages 181-222 *in* Biotic Communities of the American Southwest - United States and Mexico. D.E. Brown (ed.). Desert Plants 4(1-4).
- Tyus, H.M. and C.A. Karp. 1990. Spawning and movements of razorback sucker, *Xyrauchen texanus*, in the Green River basin of Colorado and Utah. The Southwestern Naturalist 35(4):427-433.
- U.S. Department of the Interior. Fish and Wildlife Service. 1990. Endangered and threatened wildlife and plants; determination of threatend status for for the Mohave population of desert tortoise. Federal Register 55(63):12178-12191.
- U.S. Department of the Interior. Fish and Wildlife Service. 1990. Bonytail chub Recovery Plan. Prepared by Colorado Fishes Recovery Team for the U.S. Fish and Wildlife Service, Region 6, Denver, Colorado. 35 pp.
- U.S. Department of the Interior. Fish and Wildlife Service. 1991. Endangered and threatened wildlife and plants; the razorback sucker (*Xyrauchen texanus*) determined to be an endangered species. Federal Register 56(205):54957-54967.
- U.S. Department of the Interior. Fish and Wildlife Service. 1992. Procedures for endangered species act compliance for the Mojave population of the desert tortoise. Fish and Wildlife Service, Region 1 - Portland, Region 2 - Albuquerque, and Region 6 - Salt Lake City.

- U.S. Department of the Interior. Fish and Wildlife Service. 1993. Colorado River Endangered Fishes Critical Habitat, Draft Biological Support Document. Salt Lake City, Utah. 225 pp.
- U.S. Department of the Interior. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants; determination of critical habitat for the Colorado River endangered fishes: razorback sucker, Colorado squawfish, humpback chub, and bonytail chub. Federal Register (54):13374-13400.
- U.S. Department of the Interior. Fish and Wildlife Service. 1995. Final rule determining endangered status for the southwestern willow flycatcher. Federal Register 60:10694-10715. February 27, 1995.
- U.S. Department of the Interior. Fish and Wildlife Service. 1997. Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for the Southwestern Willow Flycatcher. Federal Register 62: 39129-39147. July 22, 1997.
- U.S. Department of the Interior. Fish and Wildlife Service. 1994. Desert tortoise (Mohave population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 73 pages plus appendices.
- U.S. Department of the Interior. Fish and Wildlife Service. 1994. Determination of critical habitat for the Mohave population of desert tortoise. February 8, 1994. Federal Register (59) 5820-5846.
- U.S. Department of the Interior. Fish and Wildlife Service. 1997. Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule To List the Flat-Tailed Horned Lizard as Threatened. July 15, 1997. Federal Register (62) 37852-37860.
- U.S. Department of the Interior, Bureau of Land Management. Yuma District Resource Management Plan. (undated). Bureau of Land Management, Arizona. 55 pp.
- U.S. Department of the Interior, Bureau of Land Management. 1992. Yuma District Resource Management Plan Amendment. January 1992. Bureau of Land Management Arizona State Office, Yuma District Office. 108 pp.
- U.S. Department of the Interior, Bureau of Land Management. 1994. Final Yuma District (Bill Williams) Resource Management Plan Amendment. March 1994. Bureau of Land Management, Arizona State Office, Yuma District Office. 23 pp.
- U.S. Department of the Interior, Bureau of Land Management. 1994. Proposed Yuma District (Havasu) Resource Management Plan Amendment and Final Environmental Assessment. September 1994. Arizona State Office, Yuma District Office. 53 pp.
- U.S. Department of the Interior, Bureau of Land Management. 1996. Final Yuma District (Lands) Resource Management Plan Amendment. March 1996. Arizona State Office, Yuma District Office. 18 pp.

- U.S. Department of the Interior, Bureau of Land Management. 1996. Biological Evaluation for the Yuma District Resource Management Plan and Amendments. November 1996. Bureau of Land Management, Yuma and Lake Havasu Field Offices. 66 pp.
- Vanicek, C.C, and R.H. Kramer. 1969. Life history of the Colorado squawfish, *Ptychocheilus lucius* and the Colorado chub, *Gila robusta*, in the Green River in Dinosaur National Monument, 1964-1966. Transactions of the American Fisheries Society 98(2):193-208.
- Wagner, R.A. 1955. Basic survey of Lake Mohave. Completion Report, Project F-2-R-1. Wildlife Restoration Division, Arizona Game and Fish Department, Phoenix. 16 pp.
- Weinstein, M., K.H. Berry, and F.B. Turner. 1987. An analysis of habitat relationships of the desert tortoise in California. A report to Southern California Edison Co.