

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AG16

Endangered and Threatened Wildlife and Plants; Listing the Gila Chub as Endangered With Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service propose endangered status pursuant to the Endangered Species Act of 1973, as amended (Act), for a fish, Gila chub (*Gila intermedia*) historically found throughout the Gila River basin in southern Arizona, southwestern New Mexico, and northeastern Sonora, Mexico. Gila chub have been extirpated or reduced in numbers and distribution in the majority of its historical range (Minckley 1973, Weedman *et al.* 1996). Where it is still present, populations are often small, scattered, and at risk from known and potential threats and from random events. Threats include predation by and competition with nonnative organisms, including fish in the family Centrarchidae (*Micropterus* spp., *Lepomis* spp.), other fish species, bullfrogs (*Rana catesbeiana*), and crayfish (*Orconectes virilis*); disease; and habitat alteration, destruction, and fragmentation resulting from water diversions, dredging, recreation, roads, livestock grazing, changes in the natural flow pattern, mining, degraded water quality (including contaminants from mining activities and excessive sedimentation), and groundwater pumping. This proposed rule, if made final and in accordance with the Act, would implement Federal protection for this species, and provide funding for development and implementation of recovery actions. We seek data and comments from the public on this proposal.

DATES: Comments from all interested parties must be received by October 8, 2002. Public hearing requests must be received by September 23, 2002.

ADDRESSES: Comments and materials should be sent to the Field Supervisor, Arizona Ecological Services Field Office, U.S. Fish and Wildlife Service, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ 85021-4951. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Ann Watson, Fisheries Biologist, Arizona Ecological Services Field Office (see ADDRESSES); telephone (520) 670-4618, facsimile (520) 670-4638.

SUPPLEMENTARY INFORMATION:**Background**

The Gila chub is a member of the minnow family Cyprinidae. The Gila chub is small-finned, deep-bodied, chubby (chunky), and darkly colored (sometimes lighter on belly; diffuse lateral band(s) are rarely present). Adult males average about 150 millimeters (mm) (6 inches (in)) in total length; females can exceed 200 mm (8 in). Scales are coarse, large, thick, and broadly overlapped, and radiate out from the base. Lateral-line scales usually number greater than 61 and less than 80. There are usually eight (rarely seven or nine) dorsal and anal fin-rays; pelvic fin-rays typically number eight, but sometimes nine.

Gila chub commonly inhabit pools in smaller streams, springs, and cienegas (a desert wetland), and can survive in small artificial impoundments (Miller 1946; Minckley 1973; Rinne 1975). Gila chub are highly secretive, preferring quiet, deeper waters, especially pools, or remaining near cover including terrestrial vegetation, boulders, and fallen logs (Rinne and Minckley 1991).

Baird and Girard (1854:28) published a description of the Gila chub, as *Gila gibbosa*, based on the type specimen collected in 1851 from the Santa Cruz River. For nomenclature reasons, the name was changed by Girard to *Tigoma intermedia* in 1856, working with specimens from the San Pedro River. Despite that and other name changes, the Gila chub has been recognized as a distinct species since the 1850's, with the exception of a short period in the mid-1900's when it was placed as a subspecies of *Gila robusta* (Miller 1945). For the past 30 years, *Gila intermedia* has been recognized as a full monotypic species, separate from the polytypic species *Gila robusta*, both currently accepted as valid (Robins 1991, Mayden *et al.* 1992). Problematic populations nonetheless exist, variously assigned to one or the other taxon and leading to continued confusion. Minckley (2000) describes a new subspecies within the Gila River Basin, *Gila nigra*. It is a hybrid of *Gila robusta* and *Gila intermedia*. Its range is similar to that of *Gila intermedia* and is another headwater type chub, whereas *Gila robusta* is found in the mainstream of the major rivers within the Gila River Basin. *Gila intermedia* is the only species being addressed in this proposed rule.

Historically, Gila chub have been recorded in approximately 30 rivers, streams, and spring-fed tributaries throughout the Gila River basin in southwestern New Mexico, central and southeastern Arizona, and northern Sonora, Mexico (Miller and Lowe 1967; Rinne and Minckley 1970; Minckley 1973; Rinne 1976; DeMarais 1986; Bestgen and Propst 1989). Several populations may have originally had basin-wide distributions (*e.g.*, Babocomari River and Santa Cruz River).

Riparian and aquatic communities across the southwest have been degraded or destroyed by human activities (Hastings 1959; Hastings and Turner 1965; Henderickson and Minckley 1984). Humans have affected southwestern riparian systems over a period of several thousand years. Before the 1800's, indigenous people and missionaries used southern Arizona cienegas and riparian areas mostly for subsistence enterprises, including woodcutting, agriculture (including livestock grazing), and food and fiber harvesting.

Historically, beaver also used riparian areas almost anywhere perennial water and appropriate vegetation could be found. The activities of beaver help to promote Gila chub habitat by inhibiting erosion and downcutting of stream channels (Parker *et al.* 1985) and increasing ponded water behind the dams. Beaver were extirpated from a majority of their range by the late 1800's and are still not abundant or are extirpated from other areas where they were common (Hoffmeister 1986). For example, beaver were extirpated from the Santa Cruz and San Pedro Rivers in Arizona. Loss of this large mammal and the dams they constructed may have resulted in reaches of some streams and rivers being rendered unsuitable as habitat for the Gila chub (Hoffmeister 1986). Recently, the Bureau of Land Management (BLM) reestablished beaver into the San Pedro River to help restore the riparian community for future native fish and wildlife habitat.

There was a significant human population increase in southern Arizona and northern Sonora, Mexico, in the early to middle 1800's (Tellman *et al.* 1997). New immigrants substantially increased subsistence and commercial livestock production and agriculture. By the late 1800's, many southern Arizona watersheds were in poor condition primarily due to uncontrolled livestock grazing, mining, hay harvesting, timber harvesting, and other management practices, such as fire suppression (Bahre 1991; Humphrey 1985; Martin 1975). The watershed degradation

caused by these management practices led to widespread erosion and channel entrenchment when above-average rainfall and flooding occurred in the late 1800's (Bahre 1991; Bryan 1925; Dobyns 1981; Hastings and Turner 1980; Hendrickson and Minckley 1984; Martin 1975; Sheridan 1986; Webb and Betancourt 1992). These events led to long-term stream, cienega, and riparian habitat degradation throughout southern Arizona and northern Mexico. Physical evidence of cienega and other riparian area changes can be found in the black organic soils of the drainage cut banks in the San Rafael Valley (Hendrickson and Minckley 1984), San Pedro River (Hereford 1992), Black Draw, San Simon Valley, and elsewhere. Although these changes took place nearly a century ago, the ecosystem has not fully recovered, and in some areas may never recover.

Approximately 85 to 90 percent of the Gila chub's habitat has been degraded or destroyed, and much of it is unrecoverable. Weedman (1996) determined that 23 populations of Gila chub remain in the United States; with all but one considered small, isolated, and threatened. Not included in the 23 populations are the two populations in Larry Creek and Lousy Canyon, which were stocked with Gila chub in 1995 in an effort to reestablish them into suitable habitat. Also, the newly found population (in April 2000) occurring in Mineral Creek was not known when Weedman's survey report was prepared. For the 23 populations Weedman (1996) categorized the status of the Gila chub populations into one of four categories: (1) Stable-secure—Gila chubs are common, data over the last 5 to 10 years show a stable reproducing population, no impacts from nonnatives (predatory or competitive species), no current or future land use threats were identified; (2) Stable-threatened—Gila chub are common to uncommon, potential threats by nonnatives exist, some habitat-altering land and water uses were identified, or lack of recruitment was detected within the population; (3) Unstable-threatened—Gila chub are rare, have limited distribution, predatory or competitive nonnatives are present, or the habitat is modified or threatened; (4) Extirpated—Gila chub are no longer found within their range. These four categories are reflected in the following discussion of the current status of the Gila chub populations.

In New Mexico, Gila chub formerly inhabited the Gila River basin in Apache Creek, Catron County; Duck Creek, Grant County; and San Simon Cienega, Hidalgo County (Rinne 1969, 1976, Hubbard *et al.* 1979, Bestgen and Propst 1989, and Sublette *et al.* 1990).

All of these populations have been extirpated (Bestgen and Propst 1989). Gila chub historically inhabited cienegas of the upper San Simon River (Mckinkley 1969; Rinne 1969), but are now extirpated. The San Simon River is a Gila River tributary that originates in Hidalgo County, New Mexico, and flows 145 km (90 mi) through Cochise and Graham Counties, Arizona, to the Gila River. Gila chub were collected in the San Francisco River in 1872, but the exact location remains unknown (Sublette *et al.* 1990). An observation of a Gila chub in Turkey Creek in the upper Gila River Basin in New Mexico was made in 2001 (per. comm. Telles 2001).

In Arizona, Gila chub are known to have occupied portions of the Salt, Verde, Santa Cruz, San Pedro, San Carlos, San Simon, San Francisco, and Agua Fria drainages and smaller tributaries of the mainstem Gila River. Small remnant populations remain in most of these drainages with the exception of the Salt and San Simon Rivers, where all known populations have been extirpated.

In the Verde River basin, Walker Creek, Williamson Valley Wash, and Spring Creek populations (Yavapai County) are considered as stable-threatened populations. The Santa Cruz River has three tributaries with extant populations of Gila chub: Sabino Canyon (Pima County) and Sheehy Spring (Santa Cruz County) have unstable-threatened populations, and Cienega Creek (Pima and Santa Cruz Counties) has the only known stable-secure population of Gila chub in existence. The San Pedro River Basin has three extant, stable-threatened populations in Redfield Canyon (Graham and Pima Counties), O'Donnell Canyon (Santa Cruz County), and Bass Canyon (Graham and Cochise Counties). The status of the Gila chub in the Babocomari River (Santa Cruz and Cochise Counties) is unknown. The San Carlos River and the Blue River (Gila and Graham Counties) are on the San Carlos Apache Indian Reservation and are tributaries to the Gila River. We are aware that Gila chub are extant on the Reservation but we do not have information to document the status of Gila chub in those drainages.

The San Francisco River has two tributaries with extant populations, Harden Cienega Creek and Dix Creek in Greenlee County. The status of these two populations is unknown, but both are thought to be small. The Agua Fria River has two tributaries with stable-threatened populations, Silver and Sycamore creeks (Yavapai County), as well as two unstable-threatened

populations in Little Sycamore Creek and Indian Creek (Yavapai County). In addition, there are two populations in the Agua Fria River, Larry Creek, and Lousy Canyon (Yavapai County), for which the population status is unknown. Two tributaries of the Gila River in Arizona have extant populations of Gila chub. Eagle Creek (Graham and Greenlee Counties) has an unstable-threatened population and Bonita Creek (Graham County) has a stable-threatened population.

In Mexico, Gila chub historically occupied significant portions of the Santa Cruz and San Pedro river basins. The current known distribution of Gila chub in Mexico has been reduced to two small spring areas, Cienega los Fresnos and Cienega la Cienegita, adjacent to the Arroyo los Fresnos (tributary of the San Pedro River), within 2 km (1.2 mi) of the Arizona-Mexico border (Varela-Romero *et al.* 1992). No Gila chub remain in the Mexican portion of the Santa Cruz River basin (Weedman *et al.* 1996).

Reestablishment of Gila chub has been attempted in three Arizona sites; two sites remain extant and recruitment is good (per. comm. BLM 2002). Lousy Canyon and Larry Creek (Yavapai County) are tributaries to the Agua Fria River and were stocked with 200 Gila chub from Silver Creek on July 6, 1995. The third site, Gardner Canyon (Cochise County), was stocked with 150 Gila chub from Turkey Creek (Santa Cruz County) in July, 1988. In May, 1995 no Gila chub nor any other fish were captured during sampling surveys in Gardner Canyon.

Previous Federal Actions

On December 30, 1982, a Notice of Review of vertebrate candidate species was published in the **Federal Register** which included the Gila chub in category 1 (47 FR 58454). Category 1 at that time comprised taxa for which we had substantial information to support a proposal to list the species as endangered or threatened. In response to our letter to interested parties seeking information preparatory to a proposed listing of the Gila chub, we received a letter on March 31, 1983, from the Arizona Game and Fish Department, informing us that there was a substantial amount of information still needed on the Gila chub and recommending that the Gila chub be moved to a category 2 species. Category 2 comprised taxa for which information in our possession indicated that proposing to list as endangered or threatened was possibly appropriate, but for which conclusive data on biological vulnerability and threat was not available to support a proposed rule. On September 18, 1985,

we published a Notice of Review in the **Federal Register** (50 FR 37960) which placed the Gila chub as a category 2 species. It remained as a category 2 candidate in the Notices of Review published on January 6, 1989 (50 FR 556), and November 21, 1991, (50 FR 58815).

Beginning with our February 28, 1996, candidate Notice of Review (61 FR 7596), we discontinued the designation of multiple categories of candidates, and only those taxa meeting the definition for former category 1 candidates are now considered candidates for listing purposes. The Gila chub was approved as a candidate on August 17, 1997, and was included in the candidate Notice of Review published on September 19, 1997 (62 FR 49402). The Gila chub was also included in the following candidate Notices of Review published on October 25, 1999 (64 FR 57534), October 30, 2001 (66 FR 54808), and June 13, 2002 (67 FR 40658).

We received a petition dated June 4, 1998, to list the Gila chub as endangered and to designate critical habitat for the species from the Southwest Center for Biodiversity, on June 10, 1998. In a letter dated July 17, 1998, we responded to the petitioner that, pursuant to our July, 1996, Petition Management Guidance, candidate species are considered to be under petition and covered by a "warranted but precluded" finding under section 4(b)(3)(B)(iii) of the Act. Because listing of candidates is, by definition, already warranted, petitions on candidates are redundant. As a result, 90-day findings are not prepared for petitioned candidate species.

On August 25, 1999, the Center for Biological Diversity and Southwest Center for Biological Diversity filed a complaint against the Department of the Interior with regard to the Service not making petition findings for the Gila chub and the Chiricahua leopard frog. On June 20, 2001, the United States Court of Appeals for the Ninth Circuit held that the 1999 Candidate Notice of Review (CNOR) (64 FR 57534 (Oct. 25, 1999)) did not constitute valid warranted but precluded 12-month petition findings for the Gila chub and Chiricahua leopard frog. *Center for Biological Diversity v. Norton*, 2001 U.S. App. LEXIS 13736 (9th Cir. 2001). In response to the Ninth Circuit decision we have revised the October 30, 2001 (66 FR 54808), and June 13, 2002 (67 FR 40658), Candidate Notices of Review to address the Court's concerns.

On August 29, 2001, we announced a settlement in subsequent litigation by the Center for Biological Diversity and others which further addresses the

Ninth Circuit Court of Appeals rulings as applied to the Gila chub, as well as a number of other pending issues. Terms of the agreement require that we submit to the **Federal Register**, on or by July 31, 2002, a 12-month finding and accompanying proposed listing rule and proposed critical habitat designation for the Gila chub. This agreement was entered by the court on October 2, 2001, (*Center for Biological Diversity, et al. v. Norton*, Civ. No. 01-2063 (JR) (D.D.C.)). This proposed rule constitutes our 12-month finding for the petition to list the Gila chub.

Peer Review

In accordance with the policy promulgated July 1, 1994 (FR 34270), the expert opinions of three appropriate and independent specialists regarding this proposed rule will be solicited. The purpose of such review is to ensure listing decisions are based on scientifically sound data, assumptions, and analyses, including input of appropriate experts and specialists. Peer reviewers will be mailed copies of the proposed rule to list the Gila chub as an endangered species and to designate critical habitat following publication of this rule in the **Federal Register**. Peer reviewers will be invited to comment during the public comment period upon the specific assumptions and conclusions regarding the proposed listing. These comments will be considered in the preparation of the final listing decision.

Summary of Factors Affecting the Species

Section 4 of the Act and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in Section 4(a)(1). These factors and their application to the Gila chub (*Gila intermedia*) are as follows:

A. *The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range*

Within the historical range of the Gila chub, much of the wetland habitat has been degraded, and loss of this habitat continues today. Human activities such as groundwater pumping, surface water diversions, impoundments, channelization (straightening of the natural watercourse, typically for flood control purposes), improper livestock grazing, prescribed burning, agriculture, mining, road building, nonnative species introductions, urbanization, and

recreation all contribute to riparian and cienega habitat loss and degradation in southern Arizona and in New Mexico. The local and regional effects of these activities are expected to increase with increasing human population. The current population numbers for Tucson, Arizona, located in Pima County are 466,000 for the City and 814,600 for the County and are expected to double by the year 2054 (Tucson Chamber of Commerce 1999).

Growing water demands threaten the existence of southern Arizona perennial surface water in the Gila Basin, as well as the species that depend on it. Groundwater pumping has been a major factor in loss of surface water in springs, streams, and cienegas of Arizona, most notably in the Santa Cruz River Basin (Tellman *et al.* 1997). Groundwater levels in the Tucson area have dropped by as much as 61 meters (200 feet) (Arizona Water Research Center 1999). The Santa Cruz River and its major tributaries in the Tucson area now flow only in response to flood events (Webb and Betancourt 1992). In addition to historical losses, groundwater pumping poses a threat to surface flows in extant Gila chub habitats in Cienega Creek, Williamson Wash, and Eagle Creek. Groundwater pumping in the upper Cienega Creek drainage supports burgeoning ranchette development near the town of Sonoita. Williamson Wash is located in one of the fastest growing urban/suburban areas in Arizona. The nearby towns of Prescott and Chino Valley are growing at a rate of 3 percent per year (Prescott Chamber of Commerce 1999), and this growth is mostly based on groundwater pumping. Groundwater withdrawals in Eagle Creek are primarily for water supply for a large Phelps-Dodge open-pit copper mine at Morenci.

The increased population growth in Sierra Vista will likely stimulate borderland development, with a concurrent water demand increase that could accelerate riparian area destruction and modification and increase threats to plants and animals dependent on surface water, including the Gila chub. The San Pedro River in southern Arizona historically supported at least 13 native fish species (Jackson *et al.* 1987) but now supports only 2 (Stefferd and Stefferud 1998). Gila chub historically occupied the San Pedro River. One of the known factors that have contributed to the loss of Gila chub in the San Pedro River basin is the pumping of groundwater for agriculture and municipal uses, and sewage effluent from the community of Sierra Vista and Fort Huachuca Military Reservation. Groundwater pumping is expected to

increase with human population growth. In anticipation of population growth, Fort Huachuca Military Reservation has filed a claim for 10,522 acre-feet (A–F) per year of tributary surface water from the Gila River adjudication, more than three times the estimated 3,000 A–F currently used (Arizona Department of Water Resources 1991).

In the 1930's the city of Safford, Arizona, was granted rights-of-way to construct, operate, and maintain a water collection and distribution system for municipal use that allows them to divert a water quantity of 4000 cubic feet per second from Bonita Creek located within the Gila Box National Riparian Conservation Area. This is a large portion of the streamflow which has resulted in adverse impacts to the riparian and aquatic areas important to Gila chub.

Sections of many Gila Basin rivers and streams have been and continue to be channelized for flood control, which disrupts natural channel dynamics and promotes the loss of riparian plant communities. Channelization changes the gradient of the stream above and below the channel. It increases streamflow in the channelized section which results in increased rates of erosion of the stream and its tributaries, accompanied by gradual deposits of sediment in downstream reaches that may increase the risk of flooding (Emerson 1971; Simpson *et al.* 1982). Channelization will continue to contribute to riparian and aquatic habitat decline. Irrigation directly from stream and cienega waters diverts water away from any existing fish habitat. Fish can be carried into irrigation ditches, where they die following dessication (drying). Irrigation dams prevent movement of fish between populations, resulting in genetic isolation within species. Larger dams may also prevent movement of fish between populations and dramatically alter the flow regime of streams through the impoundment of water behind the dam and by regulating flows below the dam (Ligon *et al.* 1995).

Livestock grazing can have adverse impacts on Gila chub habitat. Poor livestock-grazing management is widely believed to have been one of the most significant factors contributing to regional stream channel downcutting in the late 1800's. Livestock grazing can destabilize stream channels and disturb riparian ecosystem functions (Tellman *et al.* 1997). Effects to Gila chub from poor livestock grazing come from increased erosion/sedimentation in stream channels, elimination of undercut banks that provide cover, alteration of channel structure and

composition of the stream bottom, loss of wetland and riparian vegetation, reduced backwater pools, decreased water quality, lowered base flows (i.e. minimum stream flow) and higher peak flows (Ohmart 1996; Hendrickson and Minckley 1984). As the water table lowers, a resultant loss of riparian vegetation may occur which allows for upland shrub species, which require less water, to invade. Upland shrub species do not have the characteristics to provide for cover or the root system to stabilize the soil and catch sediment in order to stabilize the stream bank. Cienega Creek in the Santa Cruz River basin has the only stable-secure population of Gila chub. The BLM's Empire-Cienega Resource Conservation Area (RCA) encompasses most of the portion of Cienega Creek in which Gila chub occur. Although the RCA is managed to preserve aquatic, riparian, and associated wildlife values, livestock grazing still occurs year-round on a rotational grazing system, and thus this area is still subject to a certain degree of threat caused by livestock grazing.

Mining activities were more widespread historically and may have constituted a greater threat in the past; however, the continued mining of sand and gravel, iron, gold, copper, or other materials remains a potential threat to the habitat of Gila chub. The recently proposed Gentry Iron Mine may be located within 1.6 km (1.0 mi) of two Gila chub populations on the Tonto National Forest. The resulting effects of proposed mining activities, like the Gentry Iron Mine, on these populations are uncertain at this time, but may include changes in water quality and flow rates due to dewatering of nearby streams needed for mining operations. Sand and gravel mining removes riparian vegetation and destabilizes streambanks which results in habitat loss for the Gila chub (Brown 1998). Sand and gravel mining along the Santa Cruz, San Pedro, and Babocomari Rivers has had serious impacts in the past and continues, although at a reduced scale.

Roads and recreation have adversely affected Gila chub habitat. Increased sediment is the primary problem related to roads. One source of sediment entering stream systems may result from off-road vehicles when they directly disturb and crush vegetation to the point that bare soil is exposed. Roads in forest and rangeland areas may also contribute substantially to watershed problems through direct soil disturbance during road construction. Established roads may also result in an increase of sediments entering stream systems through storm run-off.

Roads in Bonita Creek traverse this perennial streambed more than 30 times over its length (BLM 1998). Use of the existing road system creates local disturbance of normal stream function through displacement and injury of fish and macroinvertebrates, increased turbidity, and seasonal destruction of fish eggs and larvae at road crossings. Roads within the floodplain of Bonita Creek have not been engineered for long-term stability. These roads have caused erosion of stream banks and terraces in some areas. This erosion has negatively affected the condition of aquatic and associated riparian communities that support Gila chub (BLM 1998).

Another example of problems caused by roads is found in the BLM's Gila Box Riparian Natural Conservation Area (RNCA) located 12.8 km (8 mi) northeast of Safford, Arizona. The RNCA supports aquatic habitats of the Gila River, San Francisco River, Eagle Creek, Bonita Creek, and several small springs (BLM 1998). This habitat is critical to the six remaining native fish; longfin dace (*Agosia chrysogaster*), Sonora sucker (*Catostomus insignis*), Gila chub (*Gila intermedia*), desert sucker (*Catostomus Pantosteus clarki*), speckled dace (*Rhinichthys osculus*), and the reestablished razorback sucker (*Xyrauchen texanus*). The Gila River is traversed by light-weight sandrails (a type of off-road vehicle) which tend to remain above the waterline, except to cross. This activity is highest during the dry years and may be curtailed by high waters during wet years. Fish can be injured or displaced, and eggs from spawning areas can be crushed by this activity (BLM 1998).

Concentrated recreational activity in the areas along Bonita Creek, such as wading, swimming, and walking up and down the creek, displace fishes such as the Gila chub and the razorback sucker, a federally endangered fish, and alter channel morphology. Recreational use often results in crushing and trampling of vegetation on banks and terraces, resulting in adverse impacts to the Gila chub and its habitat (BLM 1998). Recreation is heavy along Sabino Canyon and affects streambanks and channel morphology; however, the rocky nature of the area may help to minimize adverse effects. Cienega Creek's recreational use is increasing and the present localized impacts, such as off-road-vehicle use, are expanding.

Human activities in the watershed have had substantial adverse impacts to Gila chub habitat. Watershed alteration is a cumulative result of many human uses, including timber harvest, livestock grazing, roads, recreation,

channelization, and residential construction. In Eagle Creek, the cumulative effects of watershed and stream-channel alteration have resulted in reduction of base flows, and some areas of the stream no longer flow during portions of the year (Minckley *et al.* 1979). In Williamson Valley Wash, human uses (e.g., recreational use of off-road vehicles) on the highly erodible upper watershed have resulted in increased erosion and high loads of sediment. In 1993, flooding in Williamson Valley Wash carried enough sediment that the isolated pool where Gila chub were previously collected became completely filled with sand and gravel (Weedman *et al.* 1996).

B. Overutilization for Commercial, Recreational, Scientific or Educational Purposes

Collection of, or fishing for, Gila chub in Arizona is prohibited by Arizona Game and Fish Commission Order 41, except where such collection is authorized by special permit. Collection of Gila chub is also prohibited in Mexico except by special permit. The collection of Gila chub is prohibited in the State of New Mexico except by special scientific permit (Propst 1999). A few individual fish may be caught incidentally by recreational anglers. However, most chub populations do not occur in popular fishing areas. No commercial uses exist for Gila chub. A limited amount of scientific collecting occurs, but does not pose a threat to Gila chub since it is regulated by the States.

C. Disease and Predation

The introduction and spread of nonnative species has been identified as one of the major factors in the continuing decline of native fishes throughout North America and particularly in the southwest (Miller 1961; Lachner *et al.* 1970; Ono *et al.* 1983; Carlson and Muth 1989; Cohen and Carlton 1995; Fuller *et al.* 1999). Miller (1989) concluded that introduced nonnatives were a causal factor in 68 percent of the fish extinctions in North America in the last 100 years. For 70 percent of those fish still extant, but considered to be endangered or threatened, introduced nonnative species are a primary cause of the decline (Aquatic Nuisance Species Task Force 1994; Lassuy 1995). In Arizona, release or dispersal of new nonnative aquatic organisms is a continuing phenomenon (Rosen *et al.* 1995).

Gila chub evolved in a fish community with low species diversity and where few predators existed, and as a result developed few or no mechanisms to deal with predation

(Carlson and Muth 1989). In its habitats, the Gila chub was probably the most predatory fish and experienced little or no competition. The introduction of more aggressive and competitive nonnative fish led to significant losses of Gila chub.

In the Gila River basin, introduction of nonnatives is considered a major factor in the decline of all native fish species (Minckley 1985, Williams *et al.* 1985; Minckley and Deacon 1991). Aquatic and semi-aquatic mammals, reptiles, amphibians, crustaceans, molluscs (snails and clams), insects, zoo- and phytoplankton, parasites, disease organisms, algae, and aquatic and riparian vascular plants outside of their historical range have all been documented to adversely affect aquatic ecosystems (McKnight 1993; Cohen and Carlton 1995; USGS 1998). As described below, the nonnative fishes have been demonstrated to pose a significant threat to Gila River basin native fishes, including Gila chub (Minckley 1985, Williams *et al.* 1985; Minckley and Deacon 1991).

The aquatic ecosystem of the central Gila River basin has relatively small streams with warm water and low gradients, and many of the native aquatic species are small. Therefore, much of the threat to native fishes comes from small nonnative fish species, as has also been noted for southern Nevada aquatic ecosystems (Deacon *et al.* 1964). Examples of this are the impacts of mosquitofish and red shiner which may compete with or predate upon native fish in the Gila River basin (Meffe 1985; Douglas *et al.* 1994). In Aravaipa Creek the red shiner has moved upstream and is competing with the native fish.

Nonnative fishes known from within historical range of Gila chub in the Gila River basin include channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*), red shiner (*Cyprinella lutrensis*), fathead minnow (*Pimephales promelas*), green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), rainbow trout (*Oncorhynchus mykiss*), western mosquitofish (*Gambusia affinis*), carp (*Cyprinus carpio*) (USFWS 1983, Young and Bettaso 1994), warmouth (*Lepomis gulosus*), bluegill (*Lepomis macrochirus*), yellow bullhead (*Ameiurus natalis*), black bullhead (*Ameiurus melas*), and goldfish (*Carassius auratus*) (Arizona Game and Fish Department [AGFD] Native Fish Database [NFDB]). Additionally, as discussed below, parasites introduced incidentally with nonnative species may

jeopardize Gila chub populations (USFWS 1983).

Dudley (1995) correlated green sunfish presence with Gila chub declines in Sabino Creek, Arizona. This included predation by small green sunfish on young-of-the-year Gila chub. Minckley *et al.* (1977) suggested that predation by green sunfish may explain the absence of Gila chub from the upper Santa Cruz River.

Western mosquitofish were introduced outside of their native ranges to help control mosquitos. Because of their aggressive and predatory behavior, mosquitofish may negatively affect populations of small fish through predation and competition (Myers 1967; Courtenay and Meffe 1989). Introduced mosquitofish have been particularly destructive in the American west where they have contributed to the elimination or decline of populations of federally threatened and endangered species such as the Gila topminnow (*Poeciliopsis occidentalis occidentalis*) (Courtenay and Meffe 1989). They often attack, shred fins, and sometimes kill other fish species. Mosquitofish are known to prey on eggs, larvae, and juveniles of various fishes, including the Gila chub.

Largemouth bass are another nonnative species intentionally introduced for the purpose of sportfishing. Introduced bass usually affect populations of small native fishes through predation, sometimes resulting in the decline or extinction of such species (Minckley 1973). Species that have suffered such effects include populations of Gila chub and Monkey spring pupfish (*Cyprinodon* sp.) (Minckley 1973).

Asian tapeworm (*Bothriocephalus acheilognathi*) was introduced into the United States via imported grass carp in the early 1970's. It has since become well established in the southeast and mid-south and has been recently found in the southwest. The definitive host in the life cycle of *Bothriocephalus acheilognathi* is cyprinid fishes and therefore, is a potential threat to the Gila chub as well as to the other native fishes in Arizona. The Asian tapeworm affects fish health in several ways. Two direct impacts are by impeding the digestion of food as it passes through the intestinal track and when large enough numbers of worms feed off of the fish causing emaciation and starvation. An indirect effect is that weakened fish are more susceptible to infection by other pathogens. The Asian tapeworm is present in the Colorado River basin in the Virgin River (Heckman *et al.* 1986) and the Little Colorado River (Clarkson *et al.* 1997). It has recently invaded the Gila River basin and was found during

the Central Arizona Project (CAP) fall, 1998 monitoring in the Gila River and Ashurst-Hayden Dam. This parasite can infest many species of fish and is carried into new areas along with nonnative fishes or native fishes from contaminated areas.

The parasite (*Ichthyophthirius multifiliis*) ("Ich") is a potential threat to Gila chub. "Ich" disease has occurred in some Arizona streams, probably favored by high temperatures and crowding as a result of drought (Mpoame 1981). The deep, quiet waters in which this host usually occurs (Minckley 1973) seem stable enough that "Ich" cysts do not wash away. This parasite was observed being transmitted on the Sonoran sucker, although it doesn't appear to be host specific and could be transmitted by other species. This protozoan becomes embedded under the skin and within the gill tissues of infected fish. When the "Ich" matures it leaves the fish, causing fluid loss, physiological stress, and sites that are susceptible to infection by other pathogens. If the "Ich" are present in large enough numbers they can also impact respiration because of damaged gill tissue.

Anchor worm (*Lernaea cyprinacea*) (Copepoda), an external parasite, is unusual in that it has little host specificity, infecting a wide range of fishes and amphibians. Additionally, infection has been known to kill large numbers of fish due to tissue damage and secondary infection of the attachment site (Hoffnagle and Cole 1997). Presence of this parasite in the Gila River basin is a threat to the Gila chub and other native fish. In July 1992, the BLM found Gila chub that were heavily parasitized by *Lernaea cyprinacea* in Bonita Creek. These fish were likely more susceptible to parasites due to physiological stress as a result of degraded habitat and decreased water flows due to water withdrawals.

Aquatic nonnative species are introduced and spread into new areas through a variety of mechanisms, both intentional and accidental, and authorized and unauthorized. Mechanisms for nonnative dispersal in the southwestern United States include interbasin water transfer, sport stocking, aquaculture, aquarium releases, bait-bucket release (release of fish used as bait by anglers), and biological control.

Gila chub collected in 1995 in the streams on or adjacent to the San Carlos Reservation have been recorded with spinal deformities and various skin lesions, probably due to the presence of contaminants in the water (USFWS 1998).

When the health of fish is compromised beyond their immune systems ability to cope with the stressors impacting it, they become vulnerable to other opportunistic pathogens that are ubiquitous in aquatic systems. These pathogens can include viruses, bacteria, fungi, and internal and external parasites.

D. The Inadequacy of Existing Regulatory Mechanisms

Existing regulatory mechanisms allow the continuing decline of Gila chub. Gila chub are threatened by introductions of nonnative fish. Fish introductions are illegal unless approved by the respective States. However, enforcement is difficult. Many nonnative fish populations are established through illegal introductions. The use of live bait is permitted in Arizona for nine species of fish, crayfish, and waterdogs (tiger salamanders (*Ambystoma pigmum*)), all of which are nonnative to the State of Arizona and several of which are known to have serious adverse effects on native species. The portion of the state in which use of live bait is permitted is limited and changes have restricted use of live bait in most of the Gila River system in Arizona (AZ Game and Fish Commission Order 40, effective January 1, 1998). The use of live bait is allowed in the Gila Basin in New Mexico (David Propst pers. comm. 1999).

The increasing restriction of live bait use will reduce the input of nonnative species into the Gila chub's habitat. However, it will do little to reduce unauthorized bait use or other forms of "bait-bucket" transfer (e.g., dumping of unwanted aquarium fish which may be invasive) not directly related to bait use. In fact, those other "bait-bucket" transfers are expected to increase as the human population of southern Arizona increases and as nonnative species become more available to the public through increased aquaculture, increased aquarium trade, and increased distribution through mechanisms such as the CAP aqueduct. The general public have been known to dump unwanted pet fish and other aquatic species into irrigation ditches such as the CAP aqueduct. The CAP aqueduct runs through the Phoenix metropolitan area.

A variety of existing international conventions and law, and Federal and State regulations provide limited protection to the Gila chub and its habitat. The Gila chub is included in *Wildlife of Special Concern* in Arizona, and State regulations prohibit collection of or fishing for Gila chub in Arizona except under special permit (AGFD

1988). In New Mexico, Gila chub is listed as endangered, and collecting is prohibited except by special permit (Propst pers. comm. 1999). In Mexico the Gila chub is endangered and the collection of threatened and endangered species is prohibited (DOF 1994). The habitat of the Gila chub and other threatened and endangered species is protected from some activities in Mexico.

The Lacey Act (16 U.S.C. 3371 *et seq.*), as amended in 1982, provides some protection for the Gila chub. This legislation prohibits the import, export, sale, receipt, acquisition, purchase, and engagement in interstate or foreign commerce of any species taken, possessed, or sold in violation of any law, treaty, or regulation of the United States, any Tribal law, or any law or regulation of any State.

The Federal Land Policy Management Act of 1976 (43 U.S.C. 1701 *et seq.*) and the National Forest Management Act of 1976 (16 U.S.C. 1600 *et seq.*) direct Federal agencies to prepare programmatic-level management plans to guide long-term resource management decisions. In addition, the FS is required to manage habitat to maintain viable populations of existing native and desired nonnative vertebrate species in planning areas (36 CFR 219.19). These regulations have resulted in the preparation of a variety of land management plans by the FS and the BLM that address management and resource protection of areas that support, or in the past supported, populations of Gila chub.

Many activities that affect the Gila chub and its habitat may occur outside of the States in which it occurs. For instance, activities such as atmospheric pollution from copper smelters or other actions that may be responsible for global amphibian declines, may also affect Gila chub. State and Federal air quality regulations strictly regulate emissions from copper smelters, historically a major source of acidic rainfall and atmospheric cadmium and arsenic in southeastern Arizona, pollutants that may affect the Gila chub (Hale and Jarchow 1988). However, a major source of these pollutants has been copper smelters in Sonora, Mexico which are not subject to the same regulations as in the United States (Hale *et al.* 1995; Blanchard and Stromberg 1987).

The FS has only limited ability to regulate introductions or stockings of nonnative species that prey on the Gila chub. Despite extensive planning efforts by the FS and implementation of management actions to maintain viable populations of native species on FS

lands, loss of Gila chub populations and metapopulations has continued.

Wetland values and water quality of aquatic sites inhabited by the Gila chub are afforded varying protection under the Federal Water Pollution Control Act of 1948 (33 U.S.C. 1251–1376), as amended; and Federal Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands), and section 404 of the Clean Water Act which regulates dredging and filling activities in waterways.

The New Mexico Department of Game and Fish has adopted a wetland protection policy whereby the Department does not endorse any project that would result in net decrease in either wetland acreage or wetland habitat values. This policy affords only limited protection to Gila chub habitat because it is advisory only; destruction or alteration of wetlands is not regulated by State law.

The State of Arizona Executive Order Number 89–16 (Streams and Riparian Resources), signed on June 10, 1989, directs State agencies to evaluate their actions and implement changes, as appropriate, to allow for restoration of riparian resources. Implementation of this regulation may reduce adverse effects of some State actions on the habitat of the Gila chub.

As discussed above, the protection afforded by these and other Federal laws and regulations discussed herein is inadequate to halt population extirpation and the degradation of the habitat of this species.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Gila chub populations remain fragmented and isolated to essentially small stream segments and are vulnerable to those natural or manmade factors that might further reduce their population size. Most of the existing populations of Gila chub occur on Federal land away from any incorporated communities and the current land uses such as livestock grazing and agriculture are the major factors in these remote areas that have contributed and will continue to contribute to the Gila chub's imperiled status. Additionally, wildfires pose a threat to the remaining extant populations. The frequency and intensity of wildfires in the Southwest has increased over the past ten years due to drought conditions, wildfire suppression activities, and increased recreational activities (*i.e.*, camping). An effort is underway to restore natural fire regimes to forest lands, but at present it is focused on areas of urban interface, and many decades will likely pass

before natural fire cycles are restored on a landscape scale across the Southwest.

The fragmentation of habitat and isolation of Gila chub populations has decreased the opportunity for additional gene flow to occur within these populations. Currently, the Gila chub has limited representation in each of the subunits within its historical range. To achieve recovery, isolated populations may need to be augmented or Gila chub may need to be reintroduced into areas where they are extirpated.

In general, Arizona is an arid state; about one-half of Arizona receives less than ten inches of rain a year. Among the most important climatic factors affecting Arizona's rivers and streams is the variable pattern of rainfall which includes winter precipitation and summer thunderstorms that can be accompanied by flash floods.

Flooding is a natural part of the hydrological cycle and is an important part of a river regime. Life cycles of plant and aquatic life are tied to annual floods. Stream biota is adapted to the seasonal cycles of flooding and low flows; which helps determine the biomass of fishes. Many native stream fishes of the southwest are morphologically and behaviorally adapted to survive periodic flooding (Harrel, 1978; Meffe 1984; Minckley and Deacon 1991). Sabino Canyon in the Santa Catalina mountains in southeastern Arizona experiences these erratic flows which have an adverse effect on both the small population of Gila chub and the existing nonnatives. Seasonal timing as well as magnitude of flooding may, therefore, differentially affect nonnative species (Dudley and Matter, 1999).

Streamflow regime refers to the permanence and seasonal patterns of streamflow. Some streams have stable flow due to ground water sources, whereas others, such as many in the Gila River basin, fluctuate significantly or are intermittent because they are fed primarily by overland runoff. Stable flows can be advantageous to some fish but are not always necessary or desirable for native species such as the Gila River Basin native fish which evolved in a system with high flow fluctuations. High flows can act as a cleansing mechanism for the streambed materials. High flows also act as a cue for timing of migration and spawning. Low flows serve as a time for recruitment and growth of young fish; however, extremely low flows can limit production of young fish. Alteration of a stream's natural flow regime may be undesirable if it adversely modifies normal seasonal high and low flows to which the stream biota is adapted

(Kohler and Hubert, 1993). Flow regimes in the Gila River Basin have been altered by watershed modification, dam construction, channelization and other human actions (Olmstead 1919; DeBano and Schmidt 1989; Tellman *et al.* 1997).

These extremes of natural floods have been modified through channelizing and diverting water predominantly for agricultural use in irrigation systems. Examples of this are the San Pedro River and Safford Valleys in which mainstream waterflows are adversely affected by groundwater and surface water withdrawals from the aquifers or streams. In the past, water was diverted from Cienega Creek for irrigation purposes within the BLM's Empire-Cienega Resource Conservation Area (RCA) (Weedman 1996). These withdrawals are made by direct surface water diversions from diversion dams or instream pumps and by pumping groundwater from the floodplain aquifer. The major consequences of channelization affecting aquatic systems include loss of specific substrate such as removal of snags, root masses, and other debris, loss of instream vegetation, loss of streamside vegetation, increased gradient and velocity, dewatering of adjacent lands, change in basic physicochemical regime, and decreased allochthonous input (energy source produced outside of the aquatic system) (U.S. Fish and Wildlife 1982). The consequences of channelization are greatest at the level of the individual organism, including effects on niches (habitat having the properties necessary for survival), food, reproduction, and behavior. At the population level, density and distribution of aquatic populations are affected.

Land use changes are the most significant secondary cause of channelization. The most simplistic impact is that of dewatering or more effectively draining an area, resulting in an immediate change from wetland associated uses to dryland associated uses (Darnell 1976), resulting in loss of wetland, marshes, and riparian areas.

Seasonal fluctuations due to droughts, floods, dams, and high human demand for water has had adverse impacts on the available surface flow, which restricted the distribution of Gila chub into small isolated populations. This fragmentation of habitat makes the Gila chub very vulnerable to threats from further habitat loss and competition from nonnative fish.

There are several conservation efforts being initiated to help the Upper San Pedro River subwatershed. The Upper San Pedro Partnership has identified a number of strategies to be pursued,

including requesting that ADWR move to establish an irrigation non-expansion area (areas in which limitations are placed on how much irrigation is allowed) in the subwatershed, acquisition of ephemeral arroyos to maximize aquifer recharge, elimination of groundwater pumping within one mile of the river through exchange of State lands and/or acquisition of private lands or water rights near the river, assistance to communities in securing funding for feasibility studies to determine the best use of their effluent, increasing recharge of storm water runoff, investigation of moving wells in Bisbee, Arizona, to areas outside of the San Pedro watershed, and other measures. The Partnership also proposes longer-term water resources planning to develop other strategies.

The San Pedro Alliance, a non-governmental entity, was recently created with the objective of providing information and plans for reducing water usage and sustaining the river in the long term. The Nature Conservancy has been active in local forums, and in public education and acquisitions of land and easements. The Udall Center for Studies in Public Policy has also been working in the subwatershed to inspire and enable community members to contribute to water-wise planning and management activities in the upper San Pedro River basin.

AGFD has several conservation projects in progress for helping to improve the status of the Gila chub. In cooperation with the Coronado National Forest, they recently completed a renovation project on Sabino Canyon to remove green sunfish and help improve the suitability of the existing Gila chub population. Two other projects that are in the planning stages and moving toward implementation are Bog Hole Wildlife Area and O'Donnell Canyon. Bog Hole Wildlife Area is a stock tank (pond) that was illegally stocked with nonnative green sunfish. Removal of these nonnatives is planned in addition to stocking tanks upstream that have potential Gila chub habitat. The second project is O'Donnell Canyon, where Gila chub are relatively abundant although nonnative green sunfish pose a threat. Removal of nonnative green sunfish is also required for this site. This project site is located in the Canelo Hills Preserve which is partially owned by TNC. This stream renovation project is a coordinated effort between TNC, the Service, the FS, and Region V of the Arizona Game and Fish Department. Both Larry Creek and Lousy Canyon have been stocked with Gila chub in an effort to reestablish them into suitable habitat.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the Gila chub in determining to propose this rule. Based on this evaluation, we are proposing to list the Gila chub as endangered. The Act defines an endangered species as one that is in danger of extinction throughout all or a significant portion of its range. The Act defines a threatened species as any species likely to become endangered within the foreseeable future. Without protections, the Gila chub will become extinct in the foreseeable future based on the following: (1) 85 to 90 percent of its habitat has been degraded or destroyed, and further degradation and destruction is ongoing; (2) extant populations of Gila chub are small and occupy habitat that has become severely fragmented, reducing chances for recolonization; and (3) competition with, and predation from, nonnatives is a major and increasing threat. These circumstances have reduced this species to an imperiled status. Therefore, the Gila chub meets the definition of an endangered species under the Act.

Critical Habitat

Definition of Critical Habitat

Critical habitat is defined in section 3 paragraph (5)(A) of the Act as (i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management consideration or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species. "Conservation" as defined by the Act, means the use of all methods and procedures that are necessary to bring an endangered species or a threatened species to the point at which listing under the Act is no longer necessary.

Critical habitat provides non-regulatory benefits to the species by informing the public and private sectors of areas that are important for species recovery and where conservation actions would be most effective. Designation of critical habitat can help focus conservation activities for a listed species by identifying areas that contain the physical and biological features that are essential for the conservation of that species, and can alert the public as well as land-managing agencies to the importance of those areas. Critical

habitat also identifies areas that may require special management considerations or protection, and may help provide protection to areas where significant threats to the species have been identified or help to avoid accidental damage to such areas.

To be included in a critical habitat designation, the habitat must be "essential to the conservation of the species." Critical habitat designations identify, to the extent known and using the best scientific and commercial data available, habitat areas that provide essential life cycle needs of the species (such as areas on which are found the primary constituent elements, as defined at 50 CFR 424.12(b)). Section 3(5)(C) of the Act states that not all areas that can be occupied by a species should be designated as critical habitat unless the Secretary determines that all such areas are essential to the conservation of the species. Our regulations (50 CFR 424.12(e)) also state that, "The Secretary shall designate as critical habitat areas outside the geographic area presently occupied by the species only when a designation limited to its present range would be inadequate to ensure the conservation of the species."

Section 4(b)(2) of the Act requires that we take into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. We may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Designation of critical habitat does not, in itself, lead to recovery of a listed species. Designation does not create a management plan, establish numerical population goals, prescribe specific management actions (inside or outside of critical habitat), or directly affect areas not designated as critical habitat. Specific management recommendations for critical habitat are most appropriately addressed in recovery plans and management plans, and through section 7 consultations.

The Service's Policy on Information Standards Under the Endangered Species Act, published in the **Federal Register** on July 1, 1994 (59 FR 34271), provides criteria, establishes procedures, and provides guidance to ensure that decisions made by us represent the best scientific and commercial data available. It requires that we, to the extent consistent with the Act and with the use of the best scientific and commercial data available, use primary and original

sources of information as the basis for recommendations to designate critical habitat. When determining which areas are critical habitat, a primary source of information should be the listing package for the species. Additional information may be obtained from a recovery plan, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, and biological assessments or other unpublished materials (*i.e.*, gray literature).

Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize that designation of critical habitat may not include all of the habitat areas that may eventually be determined to be necessary for the recovery of the species. For these reasons, all should understand that critical habitat designations do *not* signal that habitat outside the designation is unimportant or may not be required for recovery. Areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard and the section 9 take prohibition, as determined on the basis of the best available information at the time of the action. We specifically anticipate that federally funded or assisted projects affecting listed species outside their designated critical habitat areas could still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans, or other species conservation planning efforts if new information available to these planning efforts calls for a different outcome.

Application of the Section 3(5)(A) Criteria Regarding Special Management Considerations or Protection

Critical habitat is defined in section 3, paragraph (5)(A) of the Act as—(i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. Special management and protection are not

required if adequate management and protection are already in place. Adequate special management or protection is provided by a legally operative plan or agreement that addresses the maintenance and improvement of the primary constituent elements important to the species and manages for the long-term conservation of the species. If any areas containing the primary constituent elements currently were being managed to address the conservation needs of the Gila chub and did not require special management or protection, these areas would not meet the definition of critical habitat in section 3(5)(A)(i) of the Act and would not be included in the designation.

To determine if a plan provides adequate management or protection we consider three criteria: (1) Whether the plan is current and specifies the management actions and whether such actions provide sufficient conservation benefit to the species; (2) whether the plan provides assurances that the conservation management strategies will be implemented, and in determining this we consider whether: (a) A management plan or agreement exists that specifies the management actions being implemented or to be implemented; (b) the schedule for implementation is timely; (c) there is a high probability that the funding source(s) or other resources necessary to implement the actions will be available; and (d) the party(ies) have the authority and long-term commitment to implement the management actions, as demonstrated, for example, by a legal instrument providing enduring protection and management of the lands, and (3) whether the plan provides assurances that the conservation management strategies will be effective. In determining whether an action is likely to be effective, we consider whether: (a) The plan specifically addresses the management needs, including reduction of threats to the species; (b) such actions have been successful in the past; (c) there are provisions for monitoring and assessment of the effectiveness of the management actions; and (d) adaptive management principles have been incorporated into the plan.

Several areas of Gila chub habitat are covered under current management plans. The following paragraphs describe entities that have either a draft or final management plan that will likely address or that do address the conservation needs of the Gila chub within certain areas. As described below, we have not excluded areas on the basis of draft management plans.

However, plans that are finalized prior to our final determination will be evaluated by us to determine if they provide special management.

The only tribal lands affected by this proposed designation are those of the San Carlos Apache Indian Reservation. Currently, the San Carlos Indian Apache Tribe has a draft fisheries management plan which we anticipate being finalized prior to our final determination on this proposed rule. Once completed we will consider whether this plan provides adequate special management considerations or protection for the Gila chub and we may not include these lands as a result of the management plan, or we will weigh the benefits of excluding these areas under section 4(b)(2).

The BLM and TNC have a cooperative agreement to manage the Muleshoe Preserve, which is in the lower San Pedro River Area under the Muleshoe Ecosystem Management Plan. This plan addresses the necessary maintenance and improvement of the watershed that provides for the primary constituent elements important to the Gila chub, and it provides conservation goals for the Gila chub. The Muleshoe Preserve has four drainages that support Gila chub. However, only two, Double R Canyon and Wildcat Creek, are within a closed watershed basin and are currently protected from outside adverse actions in the watershed and outside sources for nonnative species invasion. These two drainages were not included in the proposed critical habitat designation because adequate special management is being provided under Muleshoe Ecosystem Management Plan.

The Nature Conservancy holds a conservation easement on private and State Park lands in the San Rafael Valley which is located in the headwaters of the Santa Cruz River. This conservation agreement prohibits activities that would be detrimental to the watershed and Gila chub habitat. This conservation easement assures that the property will be preserved forever in its predominantly open, scenic, undeveloped, and natural condition. It will prevent any use of the property that will significantly impair or interfere with the conservation values of the property and the property's natural resources and ecosystem. This easement will conserve habitat for wildlife and fisheries, protect rare and unique native plants and animals currently known or later identified. Sheehy Spring lies within this conservation easement and it supports Gila chub. We have not included Sheehy Spring in the proposed critical habitat designation because we believe that special management is

being provided by the conservation easement.

Methods

In proposing critical habitat for the Gila chub, we solicited information from knowledgeable biologists and reviewed recommendations contained in State wildlife resource reports (Weedman 1996). We also reviewed the available literature pertaining to habitat requirements, historical localities, and current localities of the Gila chub. The proposed critical habitat designation described below constitutes our best assessment of areas essential for the conservation of the Gila chub and is based on the best scientific and commercial information available. The areas proposed are within the geographical range currently occupied by the species and contain one or more of the primary constituent elements identified in the "Primary Constituent Elements" section below. All of the areas proposed as critical habitat are within the area historically occupied by the species and require special management consideration and protection to ensure their contribution to the species' recovery.

Important considerations in selection of areas included in the critical habitat designation include factors specific to each river system, such as size, connectivity, and habitat diversity, as well as rangewide recovery considerations, such as genetic diversity and representation of major portions of the species' historical range. Each area contains stream reaches that are in close proximity to nearby stream reaches with interconnected waters so that Gila chub can move between areas, at least during certain flows or seasons. The ability of the fish to repopulate areas where they have been depleted or extirpated is vital to recovery. Additionally, these reaches play a vital role in the overall health of the aquatic ecosystem and, therefore, the integrity of upstream and downstream Gila chub habitats.

Stabilization of the Gila chub at its present population level and distribution will not achieve conservation. The overall trend in the status of the Gila chub has been characterized by dramatic declines in numbers and range despite the fact that this species evolved in rapidly fluctuating, harsh environments. Known Gila chub populations remain fragmented and isolated to essentially very small stream segments and are vulnerable to those natural or manmade factors that might further reduce population size. If recovery actions fail to reverse the decline of Gila chub in its historical range, the species'

vulnerability to catastrophic events, such as the introduction of the green sunfish, or a prolonged period of low or no flow, would increase. Recovery through protection and enhancement of the existing populations, plus reestablishment of populations in suitable areas of historical range, are necessary for the species' survival and recovery. As previously stated, repatriation of Gila chub from extant populations will be evaluated as a means to recover the Gila chub in unoccupied portions of its historical habitat. Future restoration efforts will occur, pending completion of an approved recovery plan and genetic work to determine the suitability of using Gila chub from the extant populations in repatriation efforts.

In proposing critical habitat for the Gila chub, we identified all the currently known occupied sites and determined whether they contained the primary constituent elements for the future conservation of this species. Due to the lack of extensive and intensive fish surveys within the overall historical range of the Gila chub and because of the loss of Gila chub from approximately 85 to 90 percent of its range, we are only aware of small isolated populations. The Gila chub is a headwater chub, meaning that it commonly inhabits pools in smaller streams, springs, and cienegas and prefers small tributaries. Historically, it is likely that Gila chub within each of these tributaries were geographically connected by the major river systems which would have been used as migration corridors. Most of these major rivers no longer contain suitable habitat for such movement. We divided the overall historical range into seven river subunits, and each proposed critical habitat stream segment was derived from within these main river subunits. We have used these main river units for points of reference in defining our critical habitat boundaries, but we are proposing to designate critical habitat only in tributaries of these main rivers, and not the main rivers themselves.

Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, we consider those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These general categories of biological needs include, but are not limited to, the following: space for individual and population growth, and for normal behavior; food, water, or

other nutritional or physiological requirements; cover or shelter sites for breeding, reproduction, or rearing of offspring; and habitats that are protected from disturbance or are representative of the historical geographical and ecological distribution of a species.

The specific primary constituent elements required of Gila chub habitat are derived from the biological needs of the Gila chub as described below.

Space for Individual and Population Growth and Normal Behavior

Gila chub are highly secretive, preferring quiet deeper waters, especially pools, or remaining near cover including terrestrial vegetation, boulders, and fallen logs (Rinne and Minckley 1991). Undercut banks created by overhanging terrestrial vegetation with dense roots growing into pool edges provide ideal cover (Nelson 1993). Gila chub can survive in larger stream habitat such as the San Carlos River, and artificial habitats, like the Buckeye Canal (Stout *et al.* 1970; Rinne 1976). Gila chub interact with spring and small stream fishes regularly (Meffe 1985), but prefer deeper waters (Minckley 1973). Adults often are found in deep pools and eddies below areas with swift current, as in the Gila chub habitats found in Bass Canyon and Hot Springs in the Muleshoe Preserve area. Young-of-the-year inhabit shallow water among plants or eddies, while older juveniles use higher-velocity stream areas (Minckley 1973, 1991).

Young Gila chub from Monkey Spring, Santa Cruz River watershed (now extirpated), inhabited swifter areas than adults, which used undercut banks and heavily vegetated margins of the spring run (Minckley 1969). Griffith and Tiersch (1989) collected Gila chubs from both riffles and pools in Redfield Canyon. Dudley (1995) found that Gila chubs in Sabino Creek were highly reclusive in winter, occupying dark interstitial space. Adults were found in deep water with small substrates, but often away from cover. Sub-adults were more active and visible in the summer and were observed farther from cover. Sub-adults were observed more frequently in shallow areas with measurable current as water temperatures increased.

Habitats Protected from Disturbance

As discussed in factor C above, Gila chub evolved in a fish community with low species diversity and where few predators existed, and as a result developed few or no mechanisms to deal with predation (Carlson and Muth 1989). In its habitats, the Gila chub was probably the most predatory fish and

experienced little or no competition. The introduction of more aggressive and competitive nonnative fish has led to significant losses of Gila chub.

Food

Griffith and Tiersch (1989) observed that Gila chub are omnivorous (feed on both plant and animal substances). Adults appear to be principally carnivorous, feeding on large and small aquatic and terrestrial invertebrates and sometimes other small fishes (Rinne and Minckley 1991). Smaller individuals often feed on organic debris and aquatic plants (especially filamentous (threadlike) algae, and less intensely on diatoms (unicellular or colonial algae).

Griffith and Tiersch (1989) dissected 27 Gila chub stomachs from Refield Canyon, finding aquatic material that included speckled dace and dobsonfly nymphs (order Megaloptera). Terrestrial insects included primarily ants, with some caterpillars and beetles. Diatoms (algae) were most common by volume. Bottom feeding may also occur, as suggested by presence of small gravel particles. Minckley (1969) observed Gila chub chasing Gila topminnows in Monkey Spring, but not necessarily as prey.

Water Quality

Water quality is also an issue for the Gila chub. Excessive sedimentation is the primary threat to water quality for the Gila chub (as discussed in factor A above). In addition, mining activity can also introduce contaminants. For example, Gila chub that are found in Mineral Creek are limited to waters that are above the ASARCO mine. Water from the mine is drained back into Mineral Creek and no Gila chub have been found in this area.

Reproduction and Rearing of Offspring

Spawning probably occurs over beds of submerged aquatic vegetation or root wads. Nelson (1993) attempted to identify cover and substrate types, duration of spawning, breeding color changes, and water temperature during spawning in Cienega Creek, Arizona. He concluded that warmer water temperatures 20 to 24 degrees Celsius (C) (68 to 75.2 degrees Fahrenheit (F)) appear to increase breeding color intensities. Thus, warmer water temperatures may contribute to a successful spawn. For the roundtail chub, a close relative of the Gila chub, spawning occurs when water temperatures are approximately 20°C (68°F) (Bestgen *et al.* 1985). Bestgen (1985) concluded that temperature was the most significant environmental factor triggering spawning. In the 2002

Status Survey for the roundtail chub, spawning temperatures ranged from 20°C to 26.5°C (68 to 79.7°F).

We are required to list the known primary constituent elements together with a description of any critical habitat that is designated. The primary constituent elements determined necessary for survival and recovery of the Gila chub include, but are not limited to:

1. Perennial pools, areas of higher velocity between pool areas, and areas of shallow water among plants or eddies all found in small segments of headwaters, springs, or cienegas of smaller tributaries.

2. Water temperatures for spawning ranging from 20 to 26.5°C (68 to 79.7°F) with sufficient dissolved oxygen, nutrients, and any other water related characteristics needed.

3. Water quality with reduced levels of contaminants or any other water quality characteristics, including excessive levels of sediments, adverse to Gila chub health.

4. Food base consisting of invertebrates, filamentous (threadlike) algae, and insects.

5. Sufficient cover consisting of downed logs in the water channel, submerged aquatic vegetation, submerged large tree root wads, undercut banks with sufficient overhanging vegetation, large rocks and boulders with overhangs.

6. Habitat devoid of nonnative aquatic species detrimental to Gila chub or habitat in which detrimental nonnatives are kept at a level which allows Gila chub to continue to survive and reproduce. For example, the Muleshoe Preserve and Sabino Canyon Gila chub populations are devoid of nonnative aquatic species. The O'Donnell Canyon Gila chub population has continued to survive and reproduce despite the current level of nonnative aquatic species present.

7. Streams that maintain a natural unregulated flow pattern including periodic natural flooding. An example is Sabino Canyon which has experienced major floods. If flows are modified, then the stream should retain a natural flow pattern that demonstrates an ability to support Gila chub.

Proposed Critical Habitat Designation

The proposed designation includes areas within the geographical range occupied by the Gila chub that contain one or more of the primary constituent elements and that may require special management or protection. We propose to designate approximately 333.6 km (207.8 mi) of stream reaches as critical habitat.

Critical habitat vital for the conservation of Gila chub includes: cienegas, headwaters, spring-fed streams, perennial streams (Vives 1990), and spring-fed ponds (Minckley 1969). Historically, the range of the Gila chub covered over one-quarter of southeastern Arizona. The Gila chub now occupies about 10 to 15 percent of its historical range. Current populations of Gila chub are now scattered in small disjunct habitats throughout the following Counties; Yavapai, Maricopa, Gila, Coconino, Pinal, Graham, Pima, Santa Cruz, Cochise, and Greenlee.

The proposed critical habitat described below constitutes our best assessment of areas needed for the conservation of Gila chub and is based on the best scientific and commercial information available. The proposed areas are essential to the conservation of the species because they currently support populations of Gila chub and because they currently have the necessary requirements for survival, growth, and reproduction of the Gila chub (see "Primary Constituent Elements" section above). All of the proposed areas are essential to help preserve genetic diversity and adaptation capabilities of the Gila chub.

For each stream reach the up- and downstream boundaries are described below. Additionally, the proposed critical habitat includes the stream channels within the identified stream reaches and areas within these reaches potentially inundated during high flow events. Critical habitat includes the area of bankfull width plus 300 feet on either side of the banks. The bankfull width is the width of the stream or river at bankfull discharge, *i.e.*, the flow at which water begins to leave the channel and move into the floodplain (Rosgen 1996). Bankfull discharge, while a function of the size of the stream, is a fairly consistent feature related to the formation, maintenance, and dimensions of the stream channel (Rosgen 1996). This 300-foot width defines the lateral extent of those areas we believe are essential to the species' conservation.

We determined the 300-foot lateral extent for several reasons. First, the implementing regulations of the Act require that critical habitat be defined by reference points and lines as found on standard topographic maps of the area (50 CFR 424.12). Although we considered using the 100-year floodplain, as defined by the Federal Emergency Management Agency (FEMA), we found that it was not included on standard topographic maps, and the information was not readily available from FEMA or from the Army

Corps of Engineers for the areas we are proposing to designate. We suspect this is related to the remoteness of various stream reaches. Therefore, we selected the 300-foot lateral extent, rather than some other delineation, for three biological reasons: (1) The biological integrity and natural dynamics of the river system are maintained within this area (*i.e.*, the floodplain and its riparian vegetation provide space for natural flooding patterns and latitude for necessary natural channel adjustments to maintain appropriate channel morphology and geometry, store water for slow release to maintain base flows, provide protected side channels and other protected areas, and allow the river to meander within its main channel in response to large flow events); (2) conservation of the adjacent riparian area also helps provide essential nutrient recharge and protection from sediment and pollutants; and (3) vegetated lateral zones are widely recognized as providing a variety of aquatic habitat functions and values (*e.g.*, aquatic habitat for fish and other aquatic organisms, moderation of water temperature changes, and detritus for aquatic food webs) and help improve or maintain local water quality (65 FR 12897; Middle Rio Grande Biological Interagency Team 1993). We invite comments or information relating to the 300-foot lateral width of this proposed designation of critical habitat.

This proposal takes into account the naturally dynamic nature of riverine

systems and recognizes that floodplains (including riparian areas) are an integral part of the stream ecosystem. For example, riparian areas are seasonally flooded habitats (*e.g.*, wetlands) that are major contributors to a variety of vital functions within the associated stream channel (Federal Interagency Stream Restoration Working Group 1998, Brinson *et al.* 1981). They are responsible for energy and nutrient cycling, filtering runoff, absorbing and gradually releasing floodwaters, recharging groundwater, maintaining streamflows, protecting stream banks from erosion, and providing shade and cover for fish and other aquatic species. Healthy riparian areas help ensure water courses maintain the habitat components essential to aquatic species (*e.g.*, see U.S.D.A. Forest Service 1979; Briggs 1996), including the Gila chub. Habitat quality within the mainstem river channels in the historical range of the Gila chub is intrinsically related to the character of the floodplain and the associated tributaries, side channels, and backwater habitats that contribute to the key habitat features (*e.g.*, substrate, water quality, and water quantity) in these reaches.

Among other things, the floodplain provides space for natural flooding patterns and latitude for necessary natural channel adjustments to maintain channel morphology and geometry. We believe a relatively intact riparian area, along with periodic flooding in a relatively natural pattern, are important in maintaining the stream conditions

necessary for long-term survival and recovery of the Gila chub.

Conservation of the river channel alone is not sufficient to ensure the survival and recovery of the Gila chub. For the reasons discussed above, we believe the riparian corridors adjacent to the river channel provide an important function for the protection and maintenance of critical habitat and are essential to the conservation of the species.

Critical Habitat Designations

We propose the following areas as critical habitat for Gila chub (*see the "Regulation Promulgation"* section of this rule for exact legal descriptions of the critical habitat boundaries). The proposed designation includes seven river units with a total of 333.6 km (207.8 mi) of stream reaches (*see Table 1 below*). These river units represent those areas that currently are within the geographical range occupied by the Gila chub, including small tributaries, springs, and cienegas. We are not proposing to designate the mainstem river channels that may have been historically used by Gila chub as migration corridors and are currently considered outside of the occupied range of the Gila chub. In addition, most of these major rivers no longer contain suitable habitat to serve as migration corridors for movement of Gila chub. The distances and conversions below are approximate.

TABLE 1.—APPROXIMATE CRITICAL HABITAT IN STREAM KILOMETERS AND MILES (7 RIVER UNITS).

	New Mexico	Arizona	Total
Federal land (USFS and BLM)	11.6 km (7.27 mi)	185 km (115 mi)	196.6 km (122.3 mi)
State	0	11.2 km (7.0 mi)	11.2 km (7.0 mi)
County	0	17.2 km (10.7 mi)	17.2 km (10.7 mi)
Private	0	28.6 km (17.8 mi)	28.6 km (17.8 mi)
Tribal	0	80.0 km (50.0 mi)	80.0 km (50.0 mi)
Total	11.6 km (7.27 mi)	322 km (200.5 mi)	333.6 km (207.8)

Area 1

Upper Gila River Unit, Grant County, New Mexico; Greenlee and Graham counties, Arizona. Tributary streams proposed for critical habitat include Turkey Creek, Dix Creek, Harden Cienega Creek, Eagle Creek, and East Eagle Creek. All of these tributaries are within the geographical range occupied by the Gila chub. These tributaries

represent the few remaining tributaries of a low desert river that currently provide the necessary habitat for the Gila chub, in a largely natural state.

a. *Turkey Creek (New Mexico)*—11.8 km (7.3 mi) of creek extending from the edge of the Gila Wilderness boundary in the Gila National Forest and continuing upstream into the Gila Wilderness. Turkey Creek contains one or more of the primary constituent elements,

including perennial pools and the necessary vegetation that provides cover. Turkey Creek supports a population of Gila chub (David Propst pers. comm. 1999). Gila chub were collected in Turkey Creek in 2001.

b. *Eagle Creek and East Eagle Creek*—35.2 km (21.8 mi) of creek. The proposed designation extends from Eagle Creek, T. 1 S., R. 28 E., Section 31 SWSW continuing upstream to the

confluence with Dry Prong and East Eagle Creeks. The proposed designation also includes from East Eagle Creek extending from its confluence with Eagle Creek continuing upstream to its headwaters. Nine other native fishes known to occupy Eagle Creek include loach minnow, spikedace, longfin dace, speckled dace, Sonora sucker, desert sucker, razorback sucker (repatriated), roundtail chub, and an undetermined trout. This upper portion of Eagle Creek contains one or more of the primary constituent elements, including a series of permanent pools with riffle (shallow area in a streambed causing ripples) and run areas in between these pools and the necessary vegetation that provides cover. Eagle Creek has low turbidity and low salinity which significantly reduces the concentration of dissolved salts that get delivered into the Gila River, thereby providing suitable habitat for the Gila chub. Gila chub were first collected on Eagle Creek in 1987 by Clarkson near the Honeymoon Campground. There is a diversion dam just below the end of the proposed critical habitat reach that acts as a barrier to prevent nonnatives from invading from the Gila River. Periodic flooding appears to decrease the presence of nonnatives, subsequently decreasing the impacts to native fishes by nonnatives in Eagle Creek above this diversion dam (Marsh *et al.* 1990). East Eagle Creek contains one or more of the primary constituent elements, including a series of permanent pools with riffle and run areas in between these pools and the necessary vegetation that provides cover. East Eagle Creek is also hydrologically connected to Eagle Creek. The FS is currently involved in restoration work on East Eagle Creek by changing grazing management to benefit the Gila chub and other native fish.

c. *Harden Cienega Creek*—22.1 km (13.7 mi) of creek extending from the confluence with the San Francisco River upstream to its headwaters. The lower portion just above the mouth with the San Francisco River is where Gila chub were observed by Arizona State University personnel in 1995 (Weedman 1996). Harden Cienega Creek contains one or more of the primary constituent elements, including perennial pools and the necessary vegetation that provides cover.

d. *Dix Creek*—7.6 km (4.7 mi) of creek beginning one mile upstream from the confluence with the San Francisco River and continuing upstream to both the Right Prong Fork and Left Prong Fork of Dix Creek. Dix Creek is dry at the confluence with the San Francisco River, and a natural rockfall fish barrier is present at the one mile mark. This

barrier is effective in isolating the upper drainages from nonnative fish. Perennial flow and Gila chub were found in 1995, in the portion below the two forks of Dix Creek (Paul Marsh pers. com. ASU 1999). Dix Creek contains one or more of the primary constituent elements, including perennial pools, and is devoid of nonnatives.

Area 2

Middle Gila River Area—Gila and Maricopa Counties, Arizona. There are three tributaries proposed for critical habitat, Mineral Creek, Blue River, and Bonita Creek. Gila chub were first confirmed in Mineral Creek in April 2000, by AGFD and ASU Zoology Department personnel. This newly found population of Gila chub fills a gap of what was previously determined unoccupied habitat within the Middle Gila River Unit. This may help to expand future populations of Gila chub in the Middle Gila River Unit. The two populations of Gila chub on the San Carlos Apache Reservation are located in the Blue River and the upper portion of Bonita Creek.

a. *Mineral Creek*—14.4 km (8.9 mi) of creek extending from the confluence with Devil's Canyon upstream to its headwaters. Gila chub currently occupy Mineral Creek and this area contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality. Below this area, Mineral Creek flows through the ASARCO mine, where it has been contaminated and does not provide suitable habitat. The area below the mine is not being proposed as critical habitat.

b. *Blue River*—40 km (25 mi) of creek extending from the confluence with the San Carlos River and continuing upstream to its headwaters at Blue River Spring. Blue River contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality. There are two waterfalls in the Blue River that help to restrict nonnatives to areas below the falls. Below the lower waterfall nonnatives do occur.

c. *Bonita Creek*—63.5 km (39.6 mi) of creek extending from the City of Safford's withdrawal pipeline and continuing upstream to its headwaters at Bonita tank area. That portion of Bonita Creek, above this withdrawal pipeline, currently is within the geographical range occupied by Gila chub. Bonita Creek has all the necessary primary constituent elements essential for the Gila chub. Bonita Creek is maintained by a seasonal combination

of high winter and summer flows and low spring and fall flows. This combination of flows produces a diversity of habitat which permits native fish to exist. Flooding generally reduces nonnative populations and leaves the native fish community intact (Minckley and Meffe 1987). Gila chub have evolved in these dynamic flood patterns and can persist within high flood events. Gila chub were documented in Bonita Creek in 2001.

Area 3

The Babocomari River Area—Cochise County, Arizona. Historically the Babocomari River was a perennial stream which flowed through cienegas and marshlands all the way to the San Pedro River. However, livestock overgrazing destroyed much of the river. In 1995, AGFD found that the only water use was a large impoundment in the river, on the Babocomari Ranch. Perennial flows begin upstream from this impoundment near T-4 Spring. Gila chub were first collected from the Babocomari River in 1892 near Fort Huachuca Military Reservation and again in 1950, approximately 3.5 mi below the Babocomari Ranch (Weedman, *et al.* 1996). There have been no Gila chub collected in the Babocomari River and it is not being proposed for critical habitat. Tributaries to this area include O'Donnell Canyon, Turkey Creek, and Post Canyon.

a. *O'Donnell Canyon*—3.9 km (2.4 mi) of creek extending from the southern edge of the Audubon Research Ranch property upstream to the confluences of Western, Middle, and Pauline Canyons. Gila chub occupy O'Donnell Canyon and were last documented in 2001, although nonnative green sunfish pose a threat to their existence; plans for removal of sunfish are planned for the 2002 field season by the AGFD and the Coronado National Forest. O'Donnell Canyon provides the full range of primary constituent elements necessary for the conservation of the Gila chub.

b. *Turkey Creek and Post Canyon Creek*—9.1 km (5.7 mi) of creek. The proposed designation extends from Turkey Creek to the confluence with O'Donnell Creek upstream to the Arizona Highway 83 crossing. The proposed designation also includes Post Canyon from the confluence with O'Donnell Canyon continuing upstream to the existing concrete impoundment on BLM land. Habitat upstream from the Arizona Highway 83 crossing is on private land, and its condition is unknown; thus, it is not being proposed for critical habitat. Gila chub were documented in Turkey Creek in 1991 (Weedman *et al.* 1996). Turkey Creek

contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality. Post Canyon contains one or more of the primary constituent elements, including perennial pools, and is hydrologically connected to O'Donnell and Turkey Creeks. Post Canyon has only one reach that has perennial water except during extreme periods of drought. Even during periods of drought the stream maintains habitat for the Gila chub through perennial pools. The perennial portion of Post Canyon is the only portion that we are proposing to designate as critical habitat. Gila chub were collected in 1989 (Weedman 1996) in Post Canyon.

Area 4

Lower San Pedro River Area—Cochise, Graham, and Pima Counties, Arizona. Gila chub currently exist in several tributaries of this segment of the San Pedro River. Historically, Gila chub most likely occurred on both sides of the lower San Pedro River, however, documentation of Gila chub presence only exists for the east-side drainages. We are only proposing critical habitat for the east-side drainage areas.

a. *Bass Canyon*—5.4 km (3.4 mi) of creek extending from the confluence with Hot Springs Canyon upstream to the confluence with Pine Canyon. Perennial water was documented by Gori (1993) for this stream from the confluence with Hot Springs Canyon upstream 4.8 km (3.0 mi). The remainder of the stream was dry for 8 km (5.0 mi). All the State land in the Muleshoe Preserve was traded to the BLM and is managed by TNC. Beginning in 1991, biologists with TNC established eight fixed sample stations in Bass Canyon, five in Hot Springs, and three in Double R Canyon. Beginning in 1992, random pools are also sampled in the streams each year. Gila chub were collected from 1992 to 2001 in Bass Canyon. Bass Canyon contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality.

b. *Hot Springs Canyon*—1.1 km (0.69 mi) of creek extending from just below the Bass Canyon confluence downstream to the end of perennial flow, which is 0.4 km (0.25 mi) below the Muleshoe Ranch Preserve boundary. The occurrence of Gila chub within this reach of Hot Springs Canyon is sporadic due to the limited number of pools, however, Gila chub are commonly found where good pool habitat exists in Hot Springs Canyon (per. comm. TNC, 2000). Hot Springs Canyon contains one

or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality.

c. *Redfield Canyon*—3.6 km (2.2 mi) of creek extending from T. 11 S., R. 20 S, Section 31 SE continuing upstream to the confluence with Sycamore Canyon. The first documented collection of Gila chub in Redfield Canyon was in 1961. A number of collections of Gila chub occurred from 1976 to 1983. Redfield Canyon contains one of the few populations of Gila chub for which population studies have been conducted (Griffith and Tiersch 1989). Fall Fish Count (FFC) sites were established and surveyed by volunteers from 1988–1990. TNC established monitoring stations from 1991 to 1994. Gila chub were collected each year and they were the most abundant species caught in 1991 (72%) (Weedman 1996). TNC surveyed Redfield Canyon in November 2001 and Gila chub were documented. This segment of Redfield Canyon is very remote and has not had a lot of impact from humans. Additionally, no livestock grazing is permitted which contributes to the existence of the primary constituent elements for the Gila chub. Redfield Canyon has an abundant and healthy Gila chub population. Redfield Canyon contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality.

Area 5

Lower Santa Cruz River Area—Pima County, Arizona. Tributaries included in this proposed critical habitat designation are Cienega Creek, Mattie Canyon, Empire Gulch, and Sabino Canyon.

a. *Cienega Creek*—30.6 km (19.0 mi) of creek extending from the confluence with Pantano Wash and continuing upstream to T. 19 S., R. 17 E., Section 23 NWNW. The majority of Cienega Creek is federally owned and managed by the BLM with a small portion under the management of the Pima County Flood Control District. Perennial water exists within the Cienega Creek Natural Preserve managed by the Pima County Flood Control District. In March 2002, Gila chub were documented in this segment of Cienega Creek. Cienega Creek is the only stream segment that currently has a stable-secure population of Gila chub. Cienega Creek is considered to be one of the finest natural habitats for the Gila chub, and it has very few nonnative fish species. However, recent expansion of bullfrogs within the Santa Rita watershed and within Cienega Creek are raising

concerns about their impacts on native fish and leopard frogs (BLM 2001). Fish inventories of Cienega Creek and its tributaries, Mattie Canyon and Empire Gulch, have been conducted since 1989 by seining, electrofishing, and visual observation. Composition of native fish in Cienega Creek varies from its upper to lower reaches as well as from year to year. Fish sampling is difficult in Cienega Creek because of the large volume of vegetation cover, great pool depths, and undercut banks. Visual observation and electrofishing data show that a large population of adult Gila chub occupy all perennial segments of Cienega Creek. Visual observations of adult Gila chub made for the aquatic habitat inventory in 1989–1990 found 368 chub along the perennial length of Cienega Creek. This estimate is undoubtedly low due to water turbidity in some reaches, vegetation cover, and the secretive nature of Gila chub. Cienega Creek contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality.

b. *Mattie Canyon*—3.9 km (2.4 mi) of creek extending from the confluence with Cienega Creek and continuing to the BLM boundary. Gila chub have been observed in Mattie Canyon and were last collected in 1995 by the AGFD. Mattie Canyon contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality.

c. *Empire Gulch*—5.2 km (3.2 mi) of creek extending from the confluence with Cienega Creek upstream through BLM lands. The majority of this reach is on BLM land and contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality. Gila chub were documented in Empire Gulch in 1995 and in 2001 (per. comm. BLM, 2001).

d. *Sabino Canyon*—11.3 km (7.0 mi) of creek extending from the southern boundary of the Coronado National Forest upstream to the confluence with the West Fork of Sabino Canyon in the Coronado National Forest. Sabino Canyon is managed by the Coronado National Forest. Sabino Canyon has recently undergone an extensive habitat restoration project for the Gila chub involving removal of nonnatives. Gila chub were last documented in Sabino Canyon in 2002 by AGFD. Sabino contains one or more of the primary constituent elements, including perennial pools and adequate water quality.

Area 6

Upper Verde River Area—Yavapai County, Arizona. The Upper Verde River Area has two main tributaries; one extends from the confluence of Beaver Creek upstream to the confluence with Oak Creek and the second tributary is at the confluence of Williamson Valley Wash upstream of the Sullivan Lake area. A total of 30.3 km (18.8 mi) of stream are proposed as critical habitat. Silver Creek, Walker Creek, Red Tank Draw, and Williamson Valley Wash, are all tributaries to Oak and Beaver Creeks in the upper Verde River Unit. The Upper Verde River is the very northwestern part of the Gila chub's historic range. Conserving these Gila chub populations will help maintain representation of the species throughout its historic range. As recently as July 2001, Gila chub still existed in Williamson Valley Wash, Spring Creek, and Walker Creek. Surveys conducted in the Upper Verde River in 1998 have shown that all the primary constituent elements are present which help to maintain this existing population.

a. *Walker Creek*—6.8 km (4.2 mi) of creek extending from Forest road 618 crossing at T. 15 N., R. 6 E., Section 33 SE1/4 continuing upstream to T. 141/2 N., R. 6 E., Section 1 SESE. The earliest known collection of Gila chub was in 1978 by Rinne (Weedman 1996). Walker Creek was surveyed in 1994 by AGFD at five different locations; Gila chub were collected at three of those locations. The ephemeral nature of the lower end of Walker Creek appears to be limiting invasion of nonnatives from Wet Beaver Creek (Weedman 1996), thus we believe that Gila chub are still present. Walker Creek contains one or more of the primary constituent elements, including perennial pools and the necessary vegetation that provides cover.

b. *Red Tank Draw*—10.9 km (6.7 mi) of creek extending from the eastern edge of the Montezuma Castle National Monument continuing upstream to the confluence with Rarick Canyon. Red Tank Draw is an intermittent stream which offers abundant Gila chub habitat in the form of perennial pools. Gila chub were documented in Red Tank Draw in 1995 by AGFD. Red Tank Draw contains one or more of the primary constituent elements, including perennial pools and the necessary vegetation that provides cover.

c. *Spring Creek*—5.8 km (3.6 mi) of creek extending from T. 16 N., R. 4 E., Section 27 SE1/4 continuing upstream to the crossing of Arizona Highway 89A. Gila chub were documented in 1995 in Spring Creek by ADFG. Spring Creek contains one or more of the primary

constituent elements, including perennial pools and the necessary vegetation that provides cover.

d. *Williamson Valley Wash*—6.8 km (4.2 mi) of creek extending from the gaging station upstream to the crossing of the Williamson Valley Road. In 1990 Williamson Valley Wash was surveyed for Gila chub and on the Matli Ranch a large stretch of stream had perennial water (Gori 1990). Gila chub were collected during this trip on the Matli Ranch. In July 2001, Williamson Valley Wash was resurveyed and Gila chub were abundant (Bryan Bagley pers. comm.). Williamson Valley Wash contains the full range of primary constituent elements necessary for the conservation of the Gila chub.

Area 7

Agua Fria River Area—Yavapai County, Arizona. There are six tributaries in the Agua Fria River in which Gila chub exist; Little Sycamore Creek, Sycamore Creek, Indian Creek, Silver Creek, Larry Creek, and Lousy Canyon. The Agua Fria River Area represents part of the upper northwest area of the historical range of the Gila chub, and current Gila chub populations in the six drainages of this river area are healthy. There have been no reports of any diseases associated with the Gila chub in this unit. Survey results indicate a good representation of all age classes. Gila chub were translocated to Larry Creek and Lousy Canyon as a conservation action in July 1995 (Weedman 1996) by the BLM. The BLM continues to monitor these populations in Lousy Canyon and Larry Creek and has changed their grazing management to help reduce adverse effects to these healthy Gila chub populations. Conserving these Gila chub populations will help maintain representation of the species throughout its historic range. In addition, these populations can be used in future repatriation activities in other areas of the Gila chub historic range.

a. *Little Sycamore Creek*—1.2 km (0.75 mi) of creek extending from the confluence with Sycamore Creek upstream to the Horner Mountain Ranch. Little Sycamore Creek is intermittent most of its reach, and the only perennial pools are 0.8 km (0.5 mi) above the confluence with Sycamore Creek and another 0.4 km (0.25 mi) at a spring above Horner Mountain Ranch. We are proposing to designate the areas where perennial pools exist. Little Sycamore Creek has similar characteristics to Sycamore Creek. Gila chub currently occupy Little Sycamore Creek (pers. obs. Ann Watson, 2002). Gila chub have evolved in very dynamic flow regimes in many southwestern

streams and depending on climatic conditions, many streams can dry up in portions leaving small isolated pools. This leads to an intermittent stream however, the Gila chub continues to persist in these small isolated pools until the next flood or monsoon season. Little Sycamore Creek contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality.

b. *Sycamore Creek*—18.5 km (11.5 mi) of creek extending from the Rock Bottom Box continuing upstream to the Nelson Place Spring. Sycamore Creek is perennial throughout most of its length, with the last 3 km (2 mi) being temporally intermittent. Gila chub were last documented in Sycamore Creek during surveys conducted in 1995 (AGFD 1995) and again in May 2002 (USFS 2002). In the 2002 surveys, there were no nonnatives collected and all age classes were represented. Gila chub distribution was limited to the area between the Double T Waterfall and the Rock Bottom Box totaling a length of 5 km (3.0 mi) of habitat. Both of these sites are effective fish barriers and seem to have served to prevent nonnatives from invading this upper section of Sycamore Creek. Due to the remoteness of this area, it is unlikely that additional threats to the existing Gila chub population will be of concern. Livestock grazing is very limited in the upper portion of this reach due to the canyons and inaccessibility to the stream. However, below the fish barriers, livestock have access to these areas. Sycamore Creek contains one or more of the primary constituent elements, including perennial pools, the necessary vegetation that provides cover, and adequate water quality.

c. *Indian Creek*—5.3 km (3.3 mi) of Indian Creek, extending 3.2 km (2 mi) southwest of the Prescott National Forest boundary upstream 1.6 km (1 mi) inside Prescott National Forest. Gila chub were first collected in Indian Creek in May 1995. Since then, surveys have been conducted and Gila chub were observed using this stream (BLM 1999). Indian Creek contains one or more of the primary constituent elements, including perennial pools and the necessary vegetation that provides cover (per. comm. BLM 2002).

d. *Silver Creek*—6.7 km (4.2 mi) of creek, all of which is located above a natural waterfall/barrier located 4 km (2.5 mi) above the confluence with the Agua Fria River. The earliest record of Gila chub collected in Silver Creek was in 1980. Due to high recruitment of young-of-the-year, Silver Creek was the source of Gila chub that were

translocated to Larry Creek and Lousy Canyon in July 1995. Silver Creek contains one or more of the primary constituent elements, including perennial pools and the necessary vegetation that provides cover (per. comm. BLM 2002).

e. *Larry Creek*—0.80 km (0.5 mi) of creek from the confluence with an unnamed tributary then continuing upstream approximately 0.80 km (0.5 mi) to the confluence of two unnamed tributaries. In 1995 BLM translocated a population of Gila chub from Silver Creek into Larry Creek and recruitment is good (per. comm. BLM 2002). Larry Creek contains one or more of the primary constituent elements, including perennial pools and the necessary vegetation that provides cover (per. comm. BLM 2002). In addition, this area is within a canyon and it is inaccessible to cattle due to the geological nature of the canyon which acts as a barrier.

f. *Lousy Canyon*—0.28 km (.18 mi) of creek extending from a waterfall then continuing upstream approximately 0.28 km (0.18 mi) to the fork of an unnamed tributary. In 1995 BLM translocated the second population of Gila chub from Silver Creek into Lousy Canyon. This population of Gila chub is maintaining itself and recruitment is good (per. comm. BLM 2002). In October 2001 AGFD resurveyed this stream and observed an abundant population of Gila chub. Lousy Creek contains one or more of the primary constituent elements, including perennial pools and the necessary vegetation that provides cover (per. comm. BLM 2002). In addition, this area is within a canyon and it is inaccessible to cattle due to the geological nature of the canyon which acts as a barrier.

Land Ownership

Area 1

Upper Gila River Area—the ownership is predominantly FS and BLM. Turkey Creek is within the Gila Wilderness Area in the Gila National Forest. Both Eagle and East Eagle Creeks are on the Apache Sitgreaves National Forest. Both Harden Cienega and Dix Creeks are on FS land.

Area 2

Middle Gila River Area—Mineral Creek is on State of Arizona, FS, BLM, and Tribal land.

Area 3

Babocomari River Area—O'Donnell Canyon is owned by TNC and FS. The small portion of Turkey Creek is owned by private landowners and FS. Post Canyon is predominantly private with a small section of BLM.

Area 4

Lower San Pedro River Area—Bass Canyon and Hot Springs Canyon are owned by TNC. The lower end of Hot Springs Canyon is owned by the BLM. Redfield Canyon is owned predominantly by BLM and the State of Arizona with a small parcel of private land near the confluence with Sycamore Canyon.

Area 5

Lower Santa Cruz River Area—Cienega Creek's headwaters are located on 2.5 miles of Forest land and the remaining drainage is comprised predominantly of BLM and Arizona State lands. The lower end of Cienega Creek is owned by Pima County. There is a small segment of this drainage in private ownership. Both the Mattie Canyon and Empire Gulch stream segments are on BLM lands. Sabino Canyon is predominantly FS land.

Area 6

Upper Verde River Area—is comprised of four stream segments. Walker Creek and Red Tank Draw are both are on FS land. Spring Creek is predominantly on private land, with some portions on FS and Arizona State lands. Williamson Valley Wash is all on private land.

Area 7

Agua Fria River Area—is comprised of six stream segments. Little Sycamore and Sycamore Creeks are on FS land. Larry Creek and Lousy Canyon stream segments are both on BLM land. Indian and Silver Creeks landownership is comprised predominantly of BLM and FS land with a small percentage of private land.

Effect of Critical Habitat Designation

The designation of critical habitat directly affects only Federal actions. The Act requires Federal Agencies to ensure that actions they fund, authorize, or carry out do not destroy or adversely modify critical habitat to the extent that the action appreciably diminishes the value of the critical habitat for the survival and recovery of the species. Individuals, organizations, States, local and Tribal governments, and other non-Federal entities are only affected by the designation of critical habitat if their actions occur on Federal land, require a Federal permit, license, or other authorization, or involve Federal funding.

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its

proposed or designated critical habitat. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act and regulations at 50 CFR 402.10 require Federal agencies to confer with us on any action that is likely to jeopardize the continued existence of a proposed species or to result in destruction or adverse modification of proposed critical habitat.

If a species is subsequently listed or critical habitat is designated, then section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or destroy or adversely modify its critical habitat. To that end, if a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with us. Regulations at 50 CFR 402.16 also require Federal agencies to reinitiate consultation in instances where we have already reviewed an action for its effects on a listed species if critical habitat is subsequently designated.

Conference on proposed critical habitat results in a report that may provide conservation recommendations to assist the action agency in eliminating or minimizing adverse effects to the proposed critical habitat that may be caused by the proposed agency action. Our conservation recommendations in a conference report are advisory. If we subsequently finalize the proposed critical habitat, consultation on agency actions that may affect the critical habitat will result in a biological opinion as to whether the proposed action is likely to destroy or adversely modify critical habitat. If we find that proposed agency action is likely to destroy or adversely modify the critical habitat, our biological opinion may also include reasonable and prudent alternatives to the action that are designed to avoid destruction or adverse modification of critical habitat.

As a result of conferencing on proposed critical habitat, we may issue a formal conference report if requested by a Federal agency. Formal conference reports on proposed critical habitat contain a biological opinion that is prepared according to 50 CFR 402.14, as if critical habitat were designated as final. We may adopt the formal conference report as the biological opinion when the critical habitat designation is made final, if no significant new information or changes in the action alter the content of the opinion (*see* 50 CFR 402.10 (d)).

Section 4(b)(8) of the Act requires us to describe in any proposed or final regulation that designates critical habitat, a description and evaluation of those activities involving a Federal action that may adversely modify such habitat or that may be affected by such designation. Activities that may destroy or adversely modify critical habitat include those that alter the primary constituent elements (defined above) to an extent that the value of critical habitat for both the survival and recovery of the Gila chub is appreciably reduced.

To properly portray the effects of critical habitat designation, we must first compare the section 7 requirements for actions that may affect critical habitat with the requirements for actions that may affect a listed species. Section 7 prohibits actions funded, authorized, or carried out by Federal agencies from jeopardizing the continued existence of a listed species or destroying or adversely modifying the listed species' critical habitat. Actions likely to "jeopardize the continued existence" of a species are those that would appreciably reduce the likelihood of the species' survival and recovery. Actions likely to "destroy or adversely modify" critical habitat are those that would appreciably reduce the value of critical habitat for the survival and recovery of the listed species.

Common to both definitions is an appreciable detrimental effect on both survival and recovery of a listed species. Given the similarity of these definitions, and the current occurrences of the species limited to 10–15% of its historic range, actions likely to destroy or adversely modify critical habitat would almost always result in jeopardy to the species concerned, particularly when the area of the proposed action is occupied by the species concerned.

Federal actions that might occur on private, State, or Tribal lands and which may require consultation might include, but are not limited to, irrigation diversion construction and maintenance; flood repair and control; game fish stocking; timber harvest; water diversion and development; reservoir construction; water quality standards; and riparian habitat restoration. Federal agencies involved with these activities are likely to include the Natural Resources Conservation Service, Bureau of Reclamation, Environmental Protection Agency (EPA), Bureau of Indian Affairs, Indian Health Services, Federal Emergency Management Agency, Federal Communications Commission, BLM, FS, and the Service.

Federal actions involving issuance of permits to private parties which may require consultation might include, but are not limited to, issuance of National Pollution Discharge Elimination System permits by the EPA and issuance of permits under section 404 of the Clean Water Act for dredging and filling in waterways by the Corps. Examples of private actions for which 404 permits may be sought include road and bridge construction, repair and maintenance; gravel mining; flood control and repair; and water diversion construction and repair.

For Federal lands, as well as for Federal activities on private, State, or Tribal lands, the following types of activities may require Section 7 consultation.

Any activity that would alter the minimum flow or the natural flow regime of any of the proposed designated stream segments. Such activities may include, but are not limited to, groundwater pumping, impoundment, water diversion, and hydropower generation.

Any activity that might alter watershed characteristics of any of the proposed designated segments. Such activities may include, but are not limited to, vegetation manipulation (e.g., prescribed burns, timber harvest, road construction and maintenance, and naturally ignited fire (e.g., lighting), livestock grazing, and mining).

Any activity that would significantly alter the channel morphology of any of the proposed designated stream segments. Such activities may include, but are not limited to, channelization; impoundment; road and bridge construction; removal of substrate source; destruction and alteration of riparian vegetation; reduction of available floodplain; removal of gravel or floodplain terrace materials; and sedimentation from mining, livestock grazing, road construction, timber harvest, off-road vehicle use, and other watershed and floodplain disturbance.

Any activity that would alter the water chemistry in any of the proposed designated stream segments. Such activities may include, but are not limited to, release of chemical or biological pollutants into the surface waters or connected groundwater at a point source or by dispersed release (non-point).

Any activity that would introduce, spread or augment nonnative aquatic species into any of the proposed designated stream segments. Such activities may include, but are not limited to, stocking for sport, aesthetics, biological control, or other purposes; use of live bait fish, aquaculture, or

dumping of aquarium fish or other species; construction and operation of canals; and interbasin water transfers (i.e. CAP aqueduct).

In some cases designation of critical habitat may assist in focusing conservation activities by identifying areas that contain essential habitat features (primary constituent elements), regardless of whether they are currently occupied by the listed species. This identification alerts the public and land management agencies to the importance of an area in the conservation of that species. Critical habitat also identifies areas that may require management considerations or protection.

If you have any questions regarding whether specific activities will likely constitute destruction or adverse modification of critical habitat, contact the Field Supervisor, Arizona Ecological Services Office (see ADDRESSES section). Requests for copies of the regulations on listed wildlife and inquiries about permits may be addressed to the U.S. Fish and Wildlife Service, Division of Endangered Species, P.O. Box 1306, Albuquerque, New Mexico 87103 (telephone 505–248–6920; facsimile 505–248–6788).

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in public awareness and conservation actions by Federal, State, and local agencies private organizations, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed or critical habitat is designated, section 7(a)(2) requires Federal agencies

to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

The Gila chub occurs primarily on Federal lands managed by Coronado, Apache-Sitgreaves, Tonto, Prescott, Coconino, and Gila National Forests; and by the BLM. Examples of Federal actions that may affect the Gila chub include, but are not limited to, dredge-and-fill activities, livestock grazing programs, construction and maintenance of stock tanks (pond), logging and other vegetation manipulation activities, flood protection and repair measures, channelization, water development, construction and management of recreation sites, road and bridge construction and maintenance, fish stocking, issuance of rights-of-way, prescribed fire, and discretionary actions authorizing mining. These and other Federal actions would require section 7 consultation if the action agency determines that the proposed action may affect listed species.

Also subject to section 7 consultation are development activities on private and State lands when such activity is conducted by, funded by, or permitted by a Federal agency. Examples include permits issued under section 404 or 402 of the Clean Water Act from the Corps or the EPA respectively. Federal actions not affecting the species, as well as actions on private lands that are not federally funded or permitted, would not require section 7 consultation.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, codified at 50 CFR 17.21, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or attempt any of these), import or export, ship in interstate commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances.

Regulations governing permits for endangered species are codified at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. Requests for copies of the regulations regarding listed wildlife and inquires about permits may be addressed to U.S. Fish and Wildlife Service Branch of Endangered Species, P.O. Box 1306, Albuquerque, NM 87103 (505) 248-6657 fax (505) 248-6922.

Its our policy, published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable those activities that would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness as to the effects of this proposed listing on future and ongoing activities within the species' range. We believe, based on the best available information, that the following actions will not result in a violation of section 9:

(1) Actions that may affect the Gila chub that are authorized, funded, or carried out by a Federal agency when the action is conducted in accordance with an incidental take statement issued by us pursuant to section 7 of the Act, or for which such action will not result in take;

(2) Actions that may result in take of Gila chub when the action is conducted in accordance with a permit under section 10 of the Act;

(3) Recreational activities such as hiking, off-road vehicles use, camping and hunting in the vicinity of occupied Gila chub habitat that do not destroy or significantly degrade Gila chub habitat, and do not result in take of Gila chub;

(4) Release, diversion, or withdrawal of water from or near Gila chub habitat in a manner that does not displace or result in dessication or death of eggs, larvae, or adults, does not disrupt spawning activities, or does not favor introduction of nonnative predators; and does not alter vegetation.

Potential activities involving this species that we believe will likely be considered a violation of section 9 include, but are not limited to, the following:

(1) Unauthorized collection, capture, or handling of the species;

(2) Intentional introduction of nonnative predators such as nonnative fish and crayfish, into occupied Gila chub habitat;

(3) Water diversion, groundwater pumping, water releases or other water management activities that result in displacement of eggs, larvae, or adults, disruption of spawning activities,

introduction of nonnative predators, or significant alteration of vegetation within occupied Gila chub habitat;

(4) Discharge or dumping of hazardous materials, silt, or other pollutants into waters supporting Gila chub;

(5) Possession, sale, delivery, transport, or shipment of illegally taken Gila chub;

(6) Actions that take Gila chub that are not authorized by either a permit under section 10 of the Act or an incidental take statement under section 7 of the Act, or are not exempted from the section 9 take prohibitions; and

(7) Recreational activities such as hiking, off-road vehicles use, camping and hunting in the vicinity of occupied Gila chub habitat that destroy or significantly degrade Gila chub habitat, and result in take of Gila chub.

Not all the activities mentioned above will result in a violation of section 9 of the Act; only those activities which result in "take" of Gila chub would be considered violations of section 9. We will review other activities not identified above on a case by case basis to determine whether they may be likely to result in violation of section 9 of the Act.

If you have questions regarding whether specific activities will likely violate section 9, contact the Arizona Ecological Services Field Office (see **ADDRESSES** section).

Economic Analysis

Section 4(b)(2) of the Act requires that we designate critical habitat on the basis of the best scientific and commercial information available and consider the economic and other relevant impacts of designating a particular area as critical habitat. We based this proposal on the best available scientific information. We will use the economic analysis, and take into consideration all comments and information submitted during the comment period, to make a final critical habitat designation. We may exclude areas from critical habitat upon a determination that the benefits of exclusion outweigh the benefits of specifying an area as critical habitat. We cannot exclude areas from critical habitat when the exclusion will result in extinction of the species. We will conduct a robust economic analysis on the effects of the proposed critical habitat designation prior to a final determination. Our economic analysis will comply with the ruling by the Tenth Circuit Court of Appeals in *New Mexico Cattle Growers Association, et al. v. U.S. Fish and Wildlife Service*. When the draft economic analysis is completed, we will announce its

availability with a notice in the **Federal Register**, and we will reopen the comment period at that time to accept comments on the economic analysis and further comments on the proposed rule.

Secretarial Order 3206: American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act

The purpose of Secretarial Order 3206 (Secretarial Order) is to, "clarify) the responsibilities of the component agencies, bureaus, and offices of the Department of the Interior and the Department of Commerce, when actions taken under authority of the Act and associated implementing regulations affect, or may affect, Indian lands, tribal trust resources, or the exercise of American Indian tribal rights." If there is potential that a tribal activity could cause either direct or incidental take of a species proposed for listing under the Act, then meaningful government-to-government consultation will occur to try to harmonize the Federal trust responsibility to tribes and tribal sovereignty with our statutory responsibilities under the Act. The Secretarial Order also requires us to consult with tribes if the designation of an area as critical habitat might impact tribal trust resources, tribally owned fee lands, or the exercise of tribal rights. We met with representatives of the San Carlos Apache Indian Tribe, and a draft fisheries management plan has been prepared (see "Application of the Section 3(5)(A) Criteria Regarding Special Management Considerations or Protection" section above).

Public Comment Solicited

We intend that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning:

- (1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to the Gila chub;
- (2) The location of any additional populations of the Gila chub and the reasons why any habitat should or should not be determined to be critical habitat pursuant to section 4 of the Act;
- (3) Additional information concerning the range, distribution, and population size of the Gila chub;
- (4) Current or planned activities in the subject area and their possible effects on the Gila chub; and

(5) Information relating to the status of all non-native fish in the historic range of the Gila chub.

Prior to making a final determination on this proposed rule, we will take into consideration the comments and any additional information received, and such communications may lead to a final regulation that differs from this proposal.

The Act provides for one or more public hearings on this proposal, if requested. Requests must be received within 45 days of the date of publication of the proposal in the **Federal Register**. Such requests must be made in writing and be addressed to the Field Supervisor (see **ADDRESSES** section).

Clarity of the Rule

Executive Order 12866 requires each agency to write regulations/notices that are easy to read and understand. We invite your comments on how to make this proposed rule easier to understand including answers to questions such as the following: (1) Are the requirements in the proposed rule clearly stated? (2) does the proposed rule contain technical language or jargon that interferes with the clarity? (3) does the format of the proposed rule (grouping and order of sections, use of headings, paragraphing, etc.) aid or reduce its clarity? (4) is the description of the proposed rule in the **SUPPLEMENTARY INFORMATION** section of the preamble helpful in understanding the proposed rule? What else could we do to make the proposed rule easier to understand?

Send a copy of any comments that concern how we could make this proposed rule easier to understand to: Office of Regulatory Affairs, Department of the Interior, Room 7229, 1849 C Street, NW, Washington, DC 20240. You may e-mail your comments to this address: Exsec@ios.doi.gov.

Required Determinations

Regulatory Planning and Review

In accordance with Executive Order 12866, the proposed designation of critical habitat in this document is a significant rule and has been reviewed by the Office of Management and Budget (OMB). Under section 4(b)(1)(A) of the Act, the Secretary is to make listing proposals solely on the basis of the best scientific and commercial data available, after conducting a review of the status of the species and taking into account any efforts being made to protect the species. Therefore, our analyses under E.O. 12866 and the Regulatory Flexibility Act pertain only to the proposed critical habitat portion of this rule, and not to the proposed

listing. Under section 4(b)(2) of the Act, the Secretary is to designate critical habitat based on the best scientific data available and after taking into consideration the economic impact and any other relevant impact of specifying any particular area as critical habitat.

Regulatory Flexibility Act

Under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (*i.e.*, small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act (RFA) to require Federal agencies to provide a statement of the factual basis for certifying that the rule will not have a significant economic effect on a substantial number of small entities. SBREFA also amended the RFA to require a certification statement. In today's proposed rule, we are certifying that the proposed designation of critical habitat will not have a significant effect on a substantial number of small entities. The following discussion explains our rationale.

The Small Business Administration (<http://www.sba.gov/size>) defines small entities to include small organizations, such as independent non-profit organizations, and small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents, as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than \$5 million in annual sales, general and heavy construction businesses with less than \$27.5 million in annual business, special trade contractors doing less than \$11.5 million in annual business, and agricultural businesses with annual sales less than \$750,000. To determine if potential economic impacts to these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule as well as the types of project modifications that may result. In general, the term "significant economic impact" is meant to apply to a typical

small business firm's business operations.

To determine if a rule designating critical habitat would affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (*e.g.*, housing development, grazing, oil and gas production, timber harvesting, *etc.*). We apply the "substantial number" test individually to each industry to determine if certification is appropriate. In some circumstances, especially with proposed critical habitat designations of very limited extent, we may aggregate across all industries and consider whether the total number of small entities affected is substantial. In estimating the numbers of small entities potentially affected, we also consider whether their activities have any Federal involvement; some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation.

Designation of critical habitat only affects activities conducted, funded, or permitted by Federal agencies; private or State activities are not affected by the designation unless they have a Federal nexus. If the listing of the Gila chub is finalized, Federal agencies will be required to consult with us under section 7 of the Act on activities that they fund, permit, or implement that may affect the Gila chub. If this proposed critical habitat designation is finalized, Federal agencies must also consult with us if their activities may affect designated critical habitat. However, we do not believe this will result in any significant additional regulatory burden on Federal agencies or their applicants because consultation would already be required due to the presence of this species proposed for listing which presently occurs in most of the stream reaches proposed for critical habitat, and the duty to avoid adverse modification of critical habitat would not trigger additional regulatory impacts beyond the duty to avoid jeopardizing the species.

Because this species has not been listed, there is no history of consultations. Therefore, for the purposes of this review and certification under the Regulatory Flexibility Act, we are assuming that any future consultations in the area proposed as critical habitat will be due to the listing and critical habitat designation. The areas where critical habitat designations are being proposed are largely being managed for the benefit of wildlife. Projected land uses for the majority of the proposed critical habitat consists of habitat improvement projects (*i.e.*,

riparian restoration, watershed improvement, and prescribed burning), wildlife management, livestock grazing permits, and recreational use (*i.e.*, hunting, bird watching, and hiking).

On non-Federal lands, activities that lack Federal involvement would not be affected by the critical habitat designation. Activities of an economic nature that are most likely to occur on non-Federal lands in the area encompassed by this proposed designation are recreation-related activities (*i.e.*, hiking, trail construction, hunting, bird watching, and fishing) and residential development, particularly in the Williamson Valley Wash area near Prescott, Arizona.

We also considered the likelihood that this proposed designation of critical habitat would result in significant economic impacts to small entities. In general, two different mechanisms in section 7 consultations could lead to additional regulatory requirements for small entities who are usually applicants for Federal permits. First, if we conclude, in a biological opinion, that a proposed action is likely to jeopardize the continued existence of a species or adversely modify its critical habitat, we can offer "reasonable and prudent alternatives." Reasonable and prudent alternatives are alternative actions that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid jeopardizing the continued existence of listed species or resulting in adverse modification of critical habitat. A Federal agency and an applicant may elect to implement a reasonable and prudent alternative associated with a biological opinion that has found jeopardy or adverse modification of critical habitat. An agency or applicant could alternatively choose to seek an exemption from the requirements of the Act or proceed without implementing the reasonable and prudent alternative. However, unless an exemption were obtained, the Federal agency or applicant would be at risk of violating section 7(a)(2) of the Act if it chose to proceed without implementing the reasonable and prudent alternatives. Secondly, if we find that a proposed action is not likely to jeopardize the continued existence of a listed species, we may identify reasonable and prudent measures designed to minimize the amount or extent of take and require the Federal agency or applicant to implement such measures through non-discretionary terms and conditions. We may also identify discretionary conservation recommendations

designed to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, help implement recovery plans, or to develop information that could contribute to the recovery of the species.

Based on our experience with section 7 consultations for all listed species, virtually all projects—including those that, in their initial proposed form, would result in jeopardy or adverse modification determinations in section 7 consultations—can be implemented successfully with, at most, the adoption of reasonable and prudent alternatives. These measures must be economically feasible and within the scope of authority of the Federal agency involved in the consultation. As we have no consultation history for the Gila chub, we can only describe the general kinds of actions that may be identified in future reasonable and prudent alternatives. These are based on our understanding of the needs of the species and the threats it faces. The kinds of actions that may be included in future reasonable and prudent alternatives include monitoring livestock grazing in riparian areas with such stipulations as restricting livestock grazing during critical periods (*i.e.*, breeding, migration), control of exotic weeds in spring areas, water conservation measures (*e.g.*, planting native vegetation) and maintenance of minimum flows, minimize the adverse effects to the watershed by proper placement of new roads, and suspended or restricted use of pesticides or herbicides in areas occupied by and necessary for the survival and recovery of this species. Because recommended reasonable and prudent alternative measures must be economically feasible, these measures are not likely to result in a significant economic impact to a substantial number of small entities.

As required under section 4(b)(2) of the Act, we will conduct an analysis of the potential economic impacts of this proposed critical habitat designation, and will make that analysis available for public review and comment before finalizing this designation. However, a court deadline require us to publish this proposed rule before the economic analysis can be completed. We will also revisit our determination above in light of any new information provided to us through the economic analysis or through the public comment period.

In summary, we have considered whether this proposed designation of critical habitat would result in a significant economic effect on a substantial number of small entities. It would not affect a substantial number of small entities. Many of the parcels

within this designation are located in areas where likely future land uses would not be affected by designation of critical habitat. The majority of areas designated as critical habitat are on Federal land and a very small percentage (3%) is on privately owned land. In the remaining areas, Federal involvement—and thus section 7 consultations, the only trigger for economic impact due to the proposed designation of critical habitat—would be limited to a subset of the area proposed. The most likely future section 7 consultations resulting from this rule would be for habitat improvement projects (*i.e.*, riparian restoration, prescribed burning, and watershed improvements), permitting of livestock grazing, residential development, and recreational use. The proposed designation of critical habitat would result in project modifications only when proposed Federal activities, or non-Federal activities with a Federal nexus, would destroy or adversely modify critical habitat. While this may occur, it is not expected frequently enough to affect a substantial number of small entities. Even when it does occur, we do not expect it to result in a significant economic impact, as the measures included in reasonable and prudent alternatives must be economically feasible and consistent with the proposed action. Therefore, we are certifying that the proposed designation of critical habitat for the Gila chub will not have a significant economic impact on a substantial number of small entities, and an initial regulatory flexibility analysis is not required.

Federalism

In accordance with Executive Order 13132, this rule does not have significant Federalism effects. A Federalism assessment is not required. In keeping with Department of the Interior policy, we requested information from and coordinated development of this proposal with appropriate resource agencies in New Mexico and Arizona. We will continue to coordinate any future listing decisions or designation of critical habitat for the Gila chub with the appropriate Federal, State, and local agencies. Designation of critical habitat only affects activities conducted, funded, or permitted by Federal agencies; non-Federal activities are not affected by the designation if they lack Federal involvement. In areas occupied by the Gila chub, Federal agencies funding, permitting, or implementing activities will be required, if this species is listed, through consultation with us

under section 7 of the Act, to avoid jeopardizing their continued existence. If this critical habitat designation is finalized, Federal agencies also must ensure, also through consultation with us, that their activities do not destroy or adversely modify designated critical habitat.

In unoccupied areas, or areas of uncertain occupancy, designation of critical habitat could trigger additional review of Federal activities under section 7 of the Act, and may result in additional requirements on Federal activities to avoid destroying or adversely modifying critical habitat. Any development that lacked Federal involvement would not be affected by the critical habitat designation. Should a federally funded, permitted, or implemented project be proposed that may affect designated critical habitat, we will work with the Federal action agency and any applicant, through section 7 consultation, to identify ways to implement the proposed project while minimizing or avoiding any adverse effect to the species or critical habitat. In our experience, the vast majority of such projects can be successfully implemented with at most minor changes that avoid significant economic impacts to project proponents.

The designations may have some benefit to these governments in that the areas essential to the conservation of these species are more clearly defined, and the primary constituent elements of the habitat necessary to the survival of these species are specifically identified. While our definition and identification does not alter where and what federally sponsored activities may occur, these determinations may assist these local governments in long-range planning (rather than waiting for case-by-case section 7 consultations to occur).

Takings

In accordance with Executive Order 12630 (“Government Actions and Interference with Constitutionally Protected Private Property Rights”), we have analyzed the potential takings implications of the proposed listing and designation of critical habitat for the Gila chub. The takings implications assessment concludes that this proposed rule does not pose significant takings implications. A copy of this assessment is available by contacting the Arizona Ecological Services Field Office (*see ADDRESSES* section).

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et*

seq.), the Service will use the economic analysis to further evaluate this situation.

Civil Justice Reform

In accordance with Executive Order 12988, the Office of the Solicitor has determined that this rule would not unduly burden the judicial system and would meet the requirements of sections 3(a) and 3(b)(2) of the Order. We propose to list the Gila chub and designate critical habitat in accordance with the provisions of the Act. The rule uses standard property descriptions and identifies the primary constituent elements within the designated areas to assist the public in understanding the habitat needs of the Gila chub.

Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211 on regulations that significantly affect energy supply, distribution, and use. Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. Although this rule is a significant action under Executive Order 12866, it is not expected to significantly affect energy supplies, distribution, or use since the majority of the lands being proposed as critical habitat occur on lands that are primarily used for recreational, agricultural, and timber harvesting uses, and not energy production or distribution. Therefore, this action is not a significant energy action and no Statement of Energy Effects is required.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain any new collections of information other than those already approved under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and assigned Office of Management and Budget Control Number 1018-0094, which expires on July 31, 2004. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Control Number. For additional information concerning permit and associated requirements for endangered species, *see* 50 CFR 17.22.

National Environmental Policy Act

It is our position that, outside the Tenth Circuit, we do not need to prepare environmental analyses as defined by the NEPA in connection with designating critical habitat under the Endangered Species Act of 1973, as amended. We published a notice outlining our reasons for this determination in the **Federal Register**

on October 25, 1983 (48 FR 49244). This assertion was upheld in the courts of the Ninth Circuit (*Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. Ore. 1995), cert. denied 116 S. Ct. 698 (1996)). However, when the range of the species includes States within the Tenth Circuit, such as that of the Gila chub, pursuant to the Tenth Circuit ruling in *Catron County Board of Commissioners v. U.S. Fish and Wildlife Service*, 75 F.3d 1429 (10th Cir. 1996), we will undertake a NEPA analysis for critical habitat designation and notify the public of the availability of the draft environmental assessment for this proposal when it is finished.

Government-to-Government Relationship With Tribes

In accordance with the Secretarial Order 3206, "American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act" (June 5, 1997), the President's memorandum of April 29, 1994, "Government-to-Government Relations with Native American Tribal Governments" (59 FR 22951), Executive Order 13175, and the Department of the Interior's requirement at 512 DM 2, we understand that recognized Federal Indian Pueblos and Tribes must be

related to on a Government-to-Government basis. As mentioned above, we have proposed critical habitat on the Blue River and Upper Bonita Creek of the San Carlos Apache Reservation. However, the San Carlos Indian Apache Tribe has a draft fisheries management plan which we anticipate being finalized prior to our final determination on this proposed rule. We will continue to work with the San Carlos Tribe in an effort to finalize the fisheries management plan that addresses the conservation needs of the Gila chub. Once completed we will consider whether this plan provides adequate special management considerations or protection for the Gila chub and we may not include these lands as a result of the management plan, or we will weigh the benefits of excluding these areas under section 4(b)(2).

References Cited

A complete list of all references cited herein is available upon request from the Arizona Ecological Services Field Office (*see ADDRESSES* section).

Author

The primary author of this notice is Ann Watson (*see FOR FURTHER INFORMATION CONTACT*).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend Part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17— [AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Amend Section 17.11(h) by adding the following in alphabetical order, under "FISHES", to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
* * * * *							
FISHES							
* * * * *							
Chub, Gila	<i>Gila intermedia</i>	U.S.A. (AZ, NM), Mexico.	Entire	E	NA	17.95(e)	NA
* * * * *							

3. Amend Section 17.95 (e) by adding critical habitat for the Gila chub in the same alphabetical order as this species occurs in 17.11 (h).

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(e) *Fishes.*

* * * * *

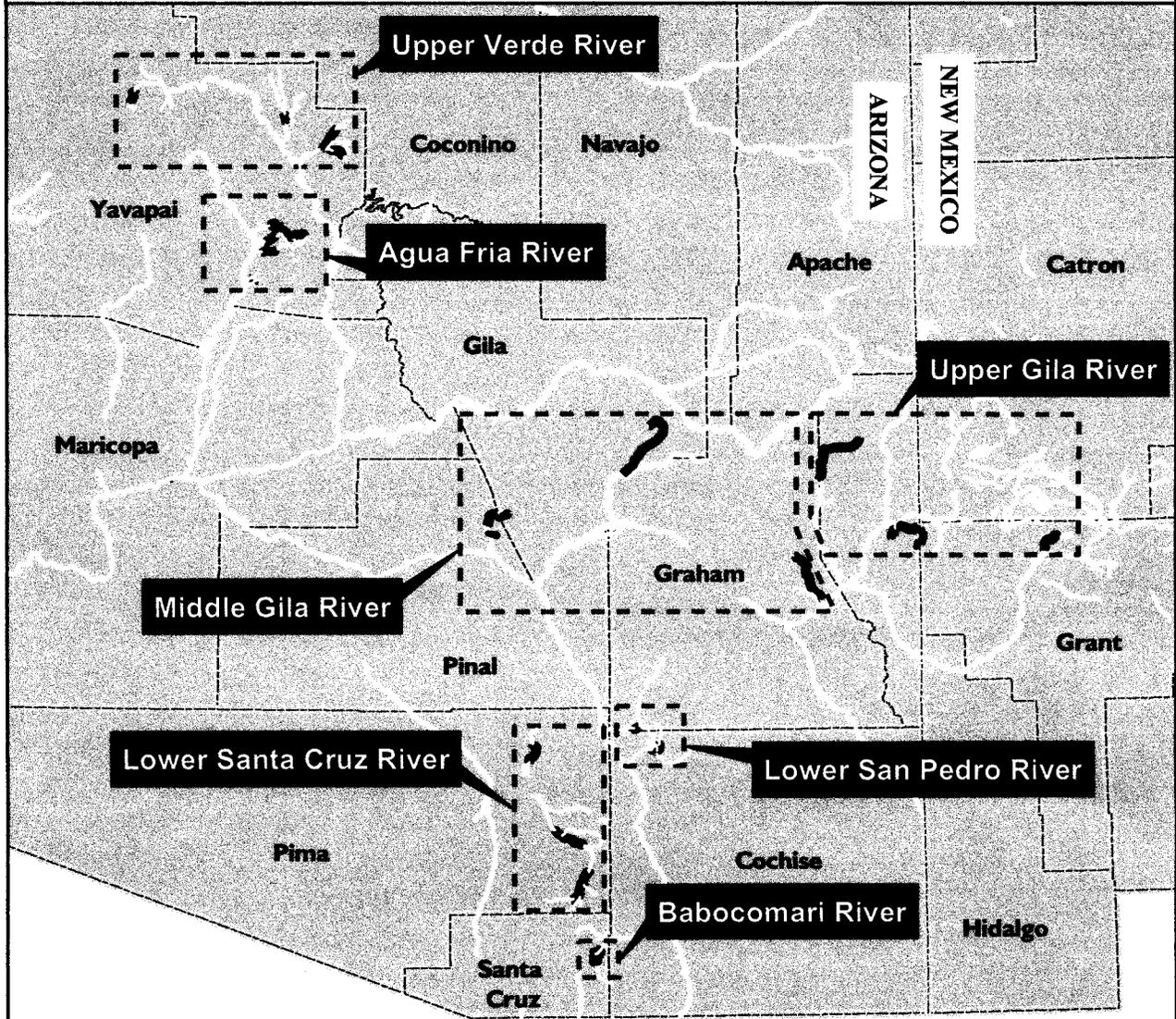
Gila chub (*Gila intermedia*)

1. Critical habitat for the Gila chub in New Mexico and Arizona is depicted on

the following overview map and as described in detail following the map.

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Overview of Areas Containing Proposed Critical Habitat for the Gila Chub (*Gila intermedia*).



Legend

- Proposed Critical Habitat*
- River Area
- Counties
- Not Proposed as Critical Habitat

0 25 50 Miles

Arizona New Mexico
Area Enlarged

* Use Constraints: This map is a graphical representation of Gila Chub (*Gila intermedia*) proposed critical habitat and is provided for illustrative purposes only. Refer to the legal descriptions in the regulation for the precise legal description of critical habitat. The map and the GIS coverages used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



Upper Gila River Area 1

a. Turkey Creek (NM)—11.8 km (7.3 mi) of creek extending from the edge of the Gila Wilderness boundary in NMPM T.4 S., R. 16 W. Section 15 NW $\frac{1}{4}$, continuing upstream to the eastern boundary of Section 25 in T.3 S., R.15 W Section 19 SE $\frac{1}{4}$.

Land ownership: Gila National Forest

b. Eagle Creek and East Eagle Creek—35.2 km (21.8 mi) of creek extending from T. 1 S., R. 28 E., Section 31 SW $\frac{1}{4}$ corner of section continuing upstream to its headwaters just south of highway

191 in T. 3 $\frac{1}{2}$ N., R. 29 E., Section 34 NW $\frac{1}{4}$.

Land ownership: Apache Sitgreaves National Forest and private

c. Harden Cienega Creek—22.1 km (13.7 mile) upstream from the confluence with the San Francisco River in GSRM, T. 3 S., R.31 E. Section 3 SE $\frac{1}{4}$, continuing upstream to the headwaters in T.3 S., R.32 E. Section 33 NW $\frac{1}{4}$ approximately 14.4 km (9.0 mi).

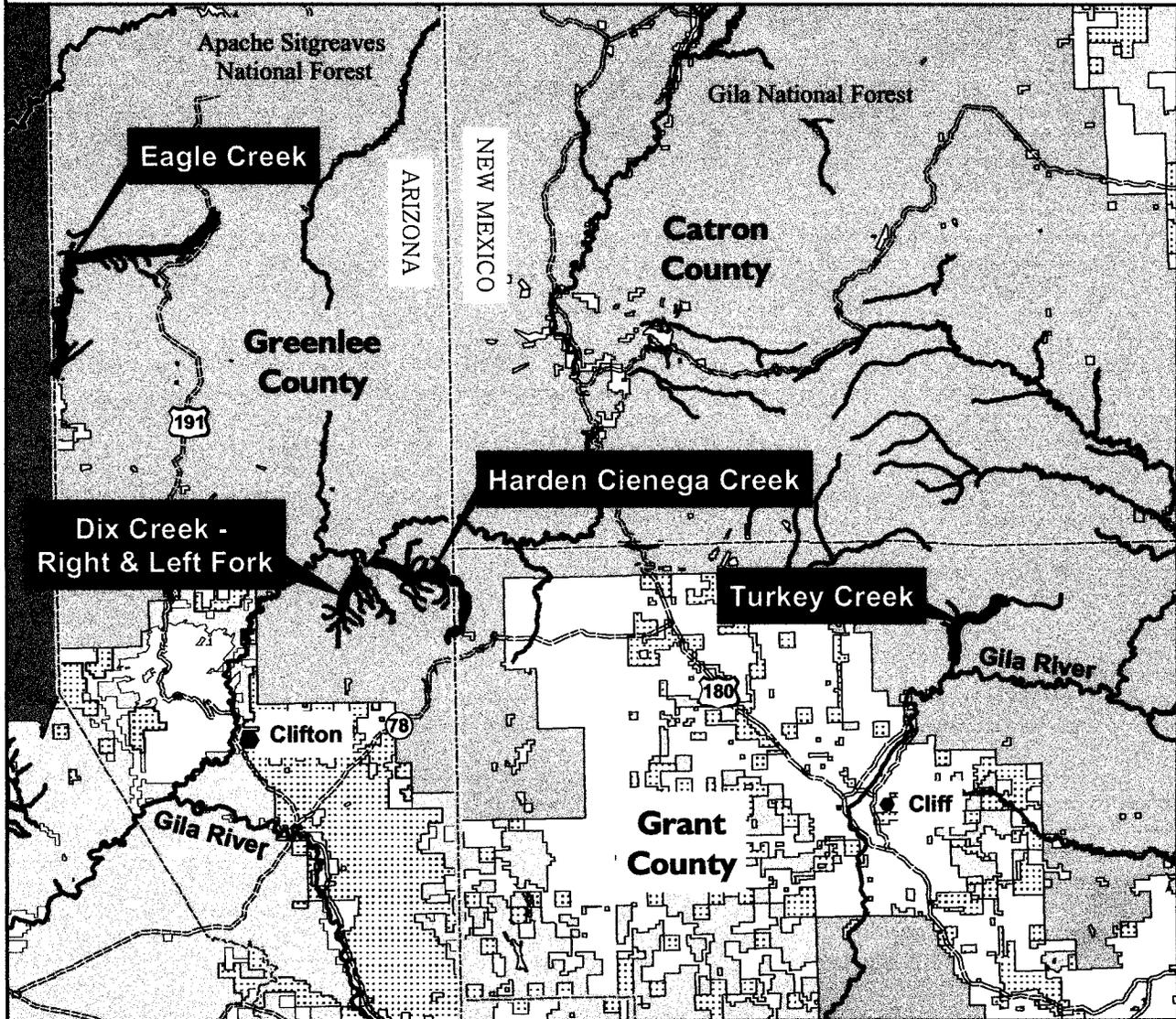
Land ownership: Apache Sitgreaves and Gila National Forest

d. Dix Creek—beginning 1 mile upstream from the confluence of Dix

Creek and the San Francisco River at a natural rock barrier in T. 3 S. R., 31 E., Section 9 NE $\frac{1}{4}$ continuing upstream for 0.8 km (0.5 mi) to the confluence of the right and left forks of Dix Creek in T. 3 S., R. 31 E., Section 9 SE $\frac{1}{4}$. Then continuing upstream 3.2 km (2 mi) in the right fork to T. 3 S., R. 31 E. Section 17 SE $\frac{1}{4}$ and continuing upstream 4.0 km (2.5) mi in the left fork to T. 3 S., R. 32 E. Section 25 SE $\frac{1}{4}$.

Land ownership: Apache Sitgreaves National Forest

General Location of Proposed Gila Chub Critical Habitat Area 1: Upper Gila River



Legend		Arizona New Mexico	
Proposed Critical Habitat	BLM	 Area Enlarged	
Rivers & Streams	Forest Service		
Major Roads	Indian Reservation		
Counties	State		
		Park Service	Private
		 0 7 14 Miles	

Use Constraints: This map is a graphical representation of Gila Chub (*Gila intermedia*) proposed critical habitat and is provided for illustrative purposes only. Refer to the legal descriptions in the regulation for the precise legal description of critical habitat. The map and the GIS coverages used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



Middle Gila River Area 2

a. Mineral Creek—14.4 km (9.0 mi) of creek extending from the confluence with Devil's Canyon in T.3 S., R. 13 E., Section 35 NW $\frac{1}{4}$ continuing upstream to its headwaters in T.2 S., R.14 E., Section 15 NE $\frac{1}{4}$.

Land ownership: Tonto National Forest, Arizona State land, and private

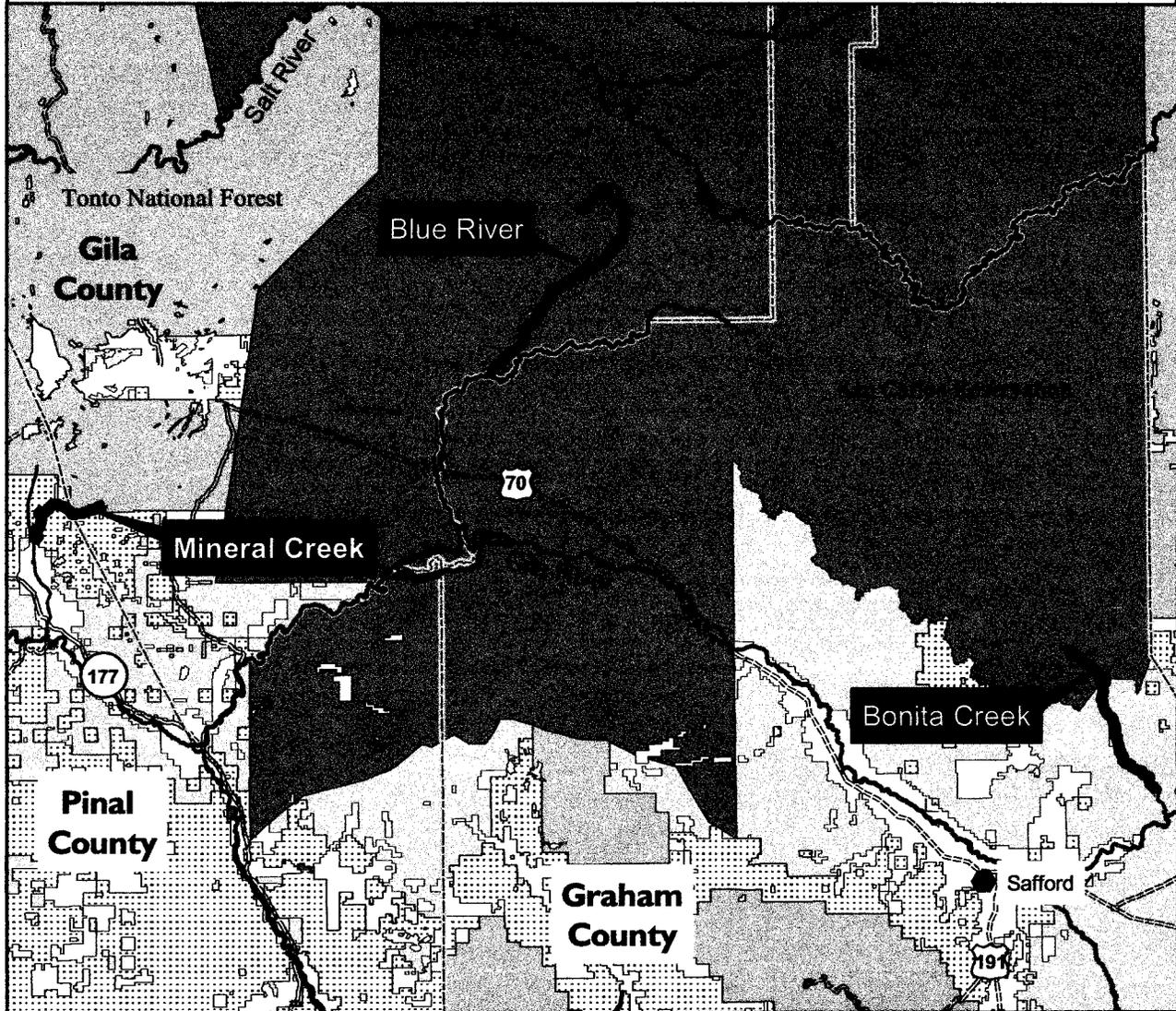
b. Blue River—40.2 km (25.0 mi) of Creek extending from the confluence with the San Carlos River in T.1 N., R.19 E., Section 29 on the border of NW and NE quarters continuing upstream to its headwaters in T.2 N., R.20 E., Section 16 Center.

Land ownership: San Carlos Apache Reservation

c. Bonita Creek—63.5 km (39.6 mi) of Creek extending from the City of Safford's diversion pipeline in GSRM T.6 S., R.28 E., Section 21 SE $\frac{1}{4}$ continuing up to its headwaters at T.3 S., R.25 E., Section 14 SW $\frac{1}{4}$.

Land ownership: Bureau of Land Management, Tribal, and private

General Location of Proposed Gila Chub Critical Habitat Area 2: Middle Gila River



Legend	
Proposed Critical Habitat	BLM
Rivers & Streams	Forest Service
Major Roads	Indian Reservation
Counties	Private
State	State

Arizona New Mexico

Area Enlarged

Use Constraints: This map is a graphical representation of Gila Chub (*Gila intermedia*) proposed critical habitat and is provided for illustrative purposes only. Refer to the legal descriptions in the regulation for the precise legal description of critical habitat. The map and the GIS coverages used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



Babocomari River Area 3

a. O'Donnell Canyon—3.9 km (2.4 mi) of creek extending from T.21 S., R.18 E., Section 33 NW $\frac{1}{4}$ on the northern boundary of Section 33, upstream to the confluences of Western, Middle, and Pauline Canyons in T.22 S., R.18 E., Section 17 NE $\frac{1}{4}$.

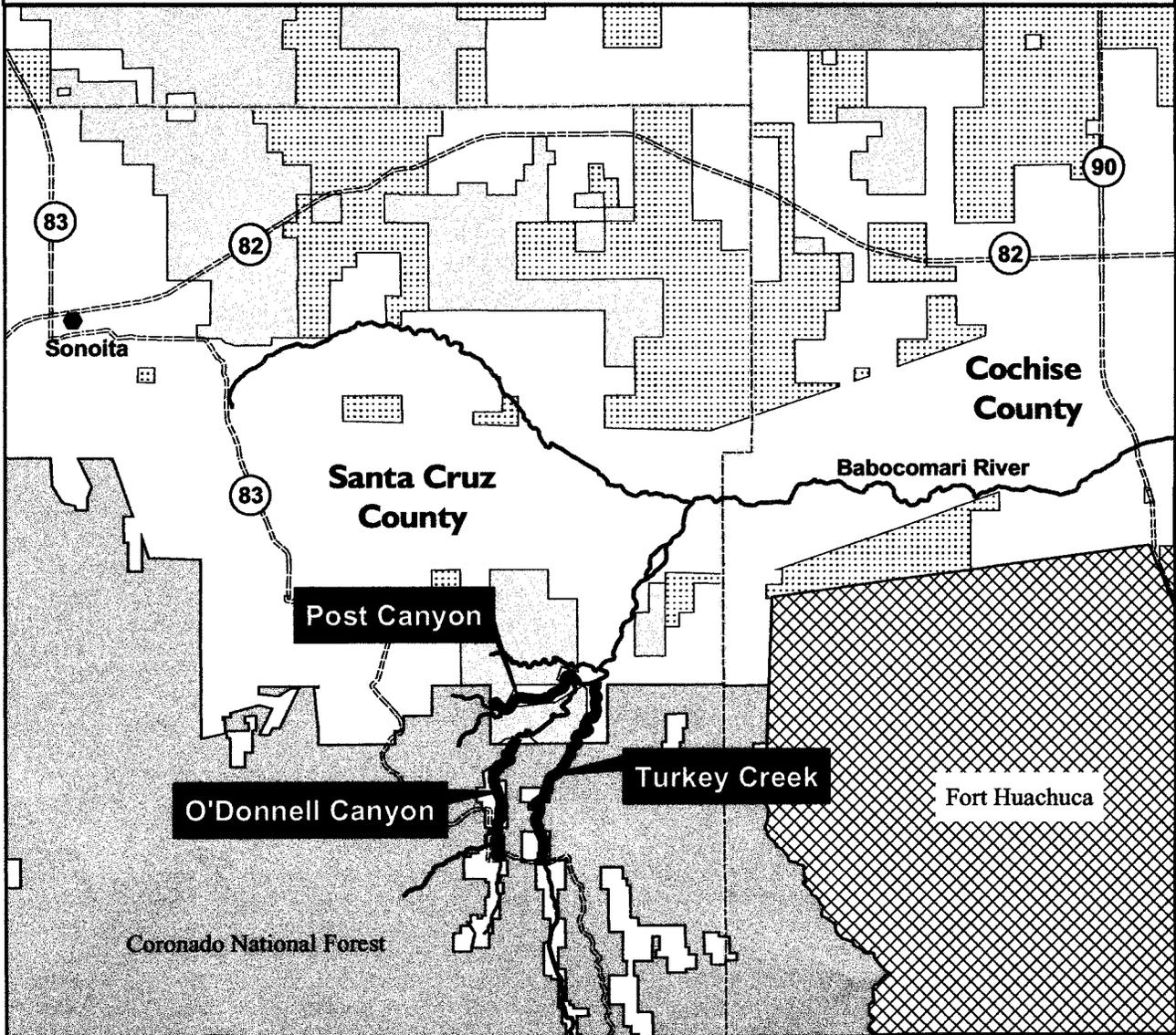
Land ownership: Private, Bureau of Land Management, and the Coronado National Forest

b. Turkey Creek—6.1 km (3.8 mi) of Creek extending from the confluence with O'Donnell Canyon in T.21 S., R.18 E., Section 22 SE $\frac{1}{4}$ upstream to where Turkey Creek crosses AZ highway 83 in T.22 S., R.18 E., Section 9 NE $\frac{1}{4}$.

Post Canyon—3.0 km (1.9 mi) of Creek extending from the confluence with O'Donnell Canyon in T.21 S., R.18 E., Section 22 SE $\frac{1}{4}$ upstream to and including the impoundment on Bureau of Land Management land in T.21 S., R.18 E., Section 28 SW $\frac{1}{4}$.

Land ownership: private and Coronado National Forest.

General Location of Proposed Gila Chub Critical Habitat Area 3: Babocomari River



Legend		
Proposed Critical Habitat	Rivers & Streams	Major Roads
Counties	BLM	Forest Service
Military	Private	State

Arizona New Mexico

Area Enlarged

Use Constraints: This map is a graphical representation of Gila Chub (*Gila intermedia*) proposed critical habitat and is provided for illustrative purposes only. Refer to the legal descriptions in the regulation for the precise legal description of critical habitat. The map and the GIS coverages used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



Lower San Pedro River Area 4

a. Bass Canyon—5.4 km (3.4 mi) of Creek extending from the confluence with Hot Springs Canyon in GSRM T.12 S., R.20 E., Section 4 NE $\frac{1}{4}$ upstream to the confluence with Pine Canyon in T.12 S., R.21 E., Section 20 center (in the center of Section).

Land ownership: Private (The Nature Conservancy)

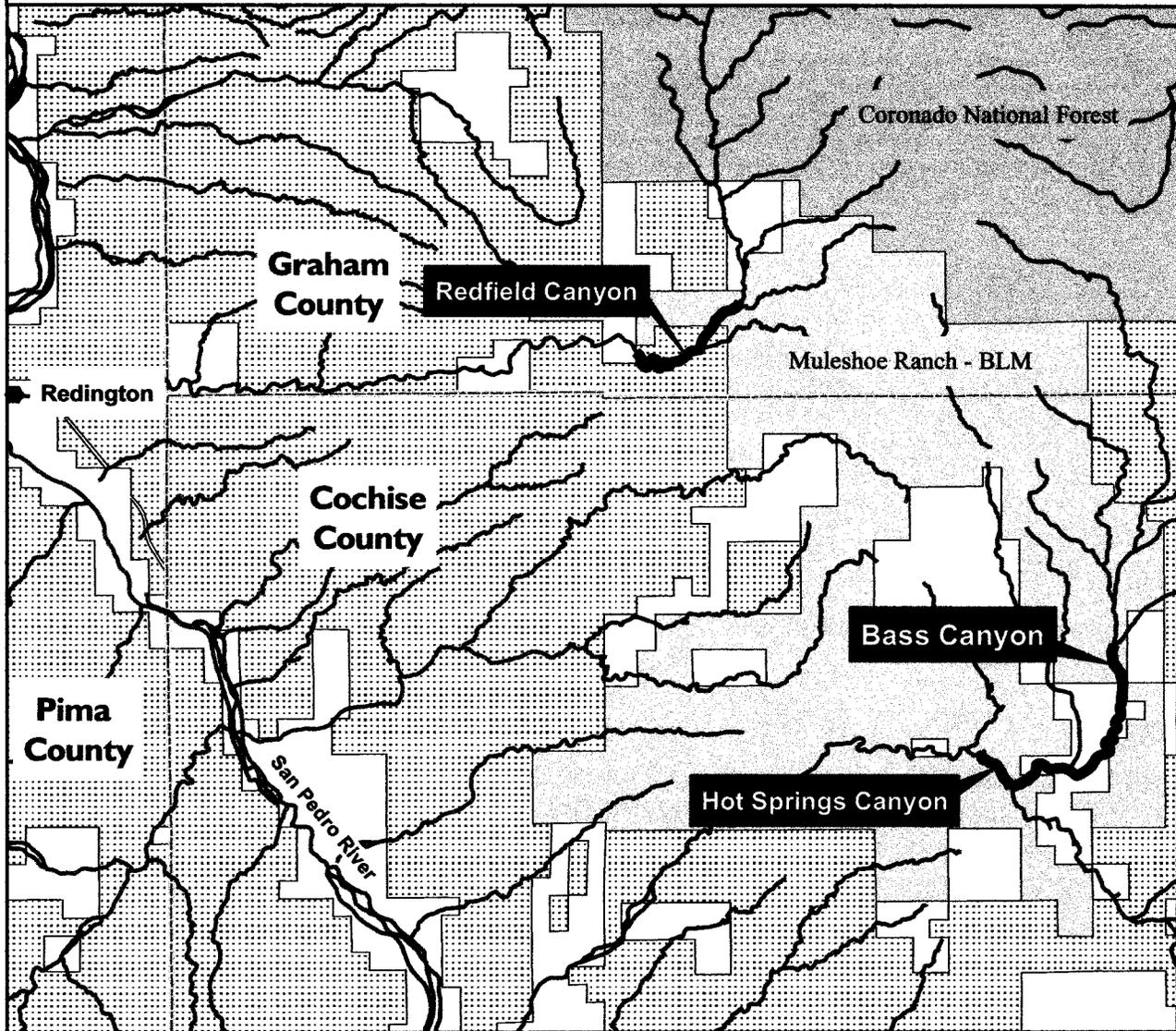
b. Hot Springs Canyon—for approximately 1.1 km (0.69 mi) extending from the Bureau of Land Management boundary in T12 S., R.20 E., Section 32 SW $\frac{1}{4}$ continuing upstream to the confluence with Bass Canyon in T.12 S., R.20 E., Section 36 NE $\frac{1}{4}$.

Land ownership: Private (The Nature Conservancy) and Bureau of Land Management

c. Redfield Canyon—3.6 km (2.2 mi) of Creek extending from the confluence with the San Pedro River in GSRM T.11 S., R.18 E., Section 34 SW $\frac{1}{4}$ upstream to the confluence with Sycamore Canyon in T.11 S., R.20 E., Section 28 NW $\frac{1}{4}$.

Land ownership: Private and Bureau of Land Management

General Location of Proposed Gila Chub Critical Habitat Area 4: Lower San Pedro River



Legend	
Proposed Critical Habitat	BLM
Rivers & Streams	Forest Service
Major Roads	Private
AZ Counties	State

Use Constraints: This map is a graphical representation of Gila Chub (*Gila intermedia*) proposed critical habitat and is provided for illustrative purposes only. Refer to the legal descriptions in the regulation for the precise legal description of critical habitat. The map and the GIS coverages used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



Lower Santa Cruz River Area 5

a. Cienega Creek—30.0 km (19.0 mi) of creek extending from the confluence with Pantano Wash in T.17 S., R.17 E., Section 1 NW $\frac{1}{4}$ continuing upstream to T.19 S., R.17 E., Section 23 NW $\frac{1}{4}$.

Land ownership: Bureau of Land Management, Arizona State land, and private

b. Mattie Canyon—3.9 km (2.4 mi) of creek extending from the confluence

with Cienega Creek in T.18 S., R. 17 E., Section 23 NE $\frac{1}{4}$ upstream to the Bureau of Land Management boundary in T.18 S., R.17 E., Section 26 SE $\frac{1}{4}$.

Land ownership: Bureau of Land Management

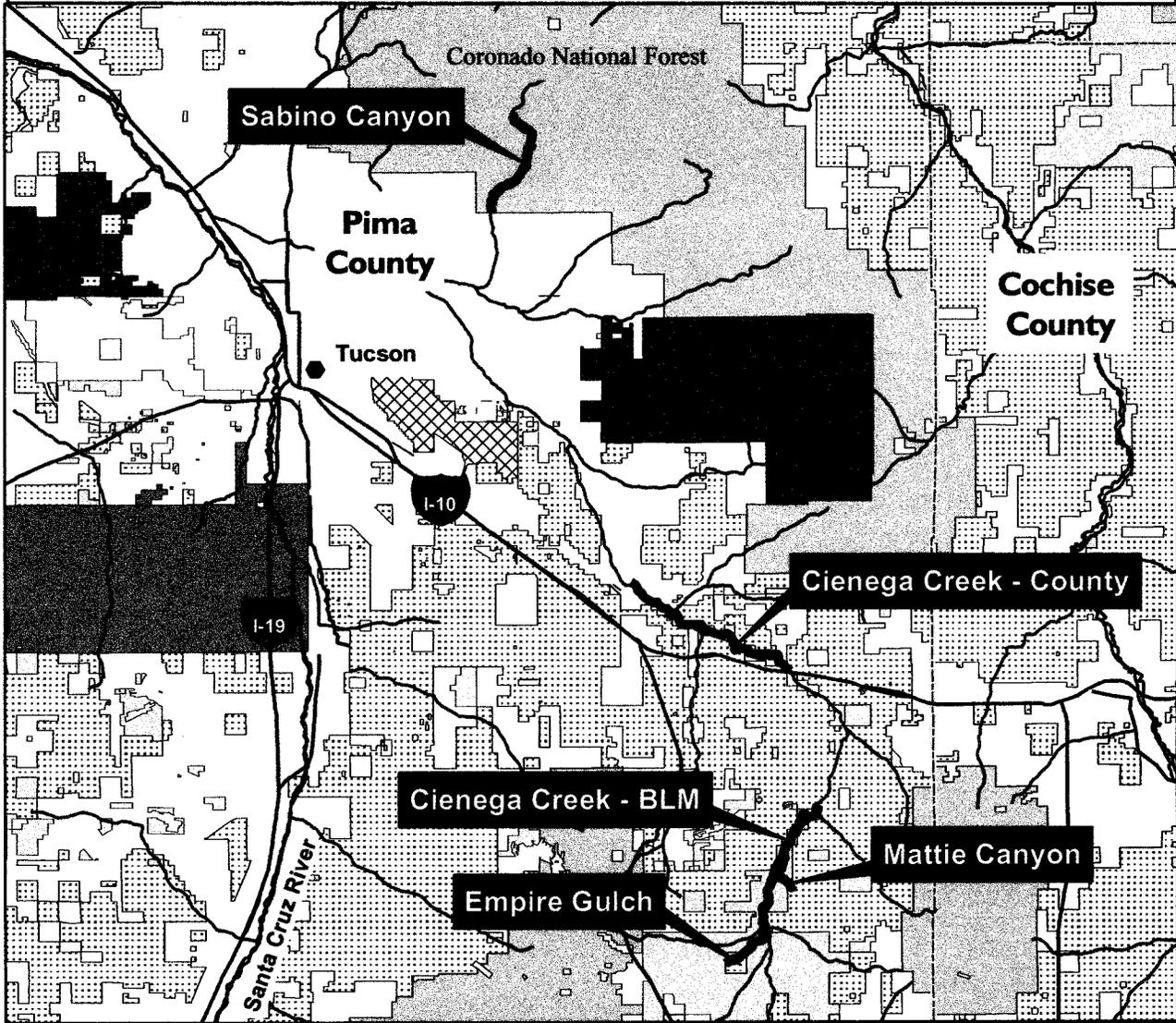
c. Empire Gulch—5.2 km (3.2 mi) of creek extending from its confluence with Cienega Creek in T.19 S., R.17 E., Section 3 NE $\frac{1}{4}$ continuing upstream to T.19 S., R.17 E., Section 16 NW $\frac{1}{4}$ on the western boundary of Section 16.

Land ownership: Bureau of Land Management

d. Sabino Canyon—from the southern boundary of the Coronado National Forest in T.13 S., R.15 E., Section 9 SE $\frac{1}{4}$ upstream to the confluence with the West Fork of Sabino Canyon in T.12 S., R.15 E., Section 22 SE $\frac{1}{4}$ approximately 17.7 kilometers (11.0 miles).

Land ownership: Coronado National Forest

General Location of Proposed Gila Chub Critical Habitat Area 5: Lower Santa Cruz River



Legend		
Proposed Critical Habitat	BLM	Park Service
Rivers & Streams	Forest Service	Parks & Recreation
Major Roads	Indian Reservation	Private
Counties	Military	State

Arizona New Mexico

Area Enlarged

Use Constraints: This map is a graphical representation of Gila Chub (*Gila intermedia*) proposed critical habitat and is provided for illustrative purposes only. Refer to the legal descriptions in the regulation for the precise legal description of critical habitat. The map and the GIS coverages used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



Verde River Area 6

a. Walker Creek—6.8 km (4.2 mi) of Creek extending from the Prescott National Forest Road 618 in GSRM T.14 ½ N., R 6 E., Section 33 SE ¼ continuing upstream to the confluence with Spring Creek in T 14 ½ N., R. 6 E., Section 1 SE ¼.

Land ownership: Coconino National Forest

b. Red Tank Draw—10.9 km (6.7 mi) of Creek extending from the confluence

with Wet Beaver Creek in GSRM T. 14 ½ N., R. 6 E., Section 31 NE ¼ continuing upstream to the confluence with Mullican and Rarick Canyons (the point at which Red Tank Draw separates into two separate drainages) in T. 15 N., R. 6 E., Section 2 SW ¼.

Land ownership: Coconino National Forest

c. Spring Creek—5.8 km (3.6 mi) of creek extending from T.16 N., R. 4 E., Section 27 SE ¼ at the boundary of

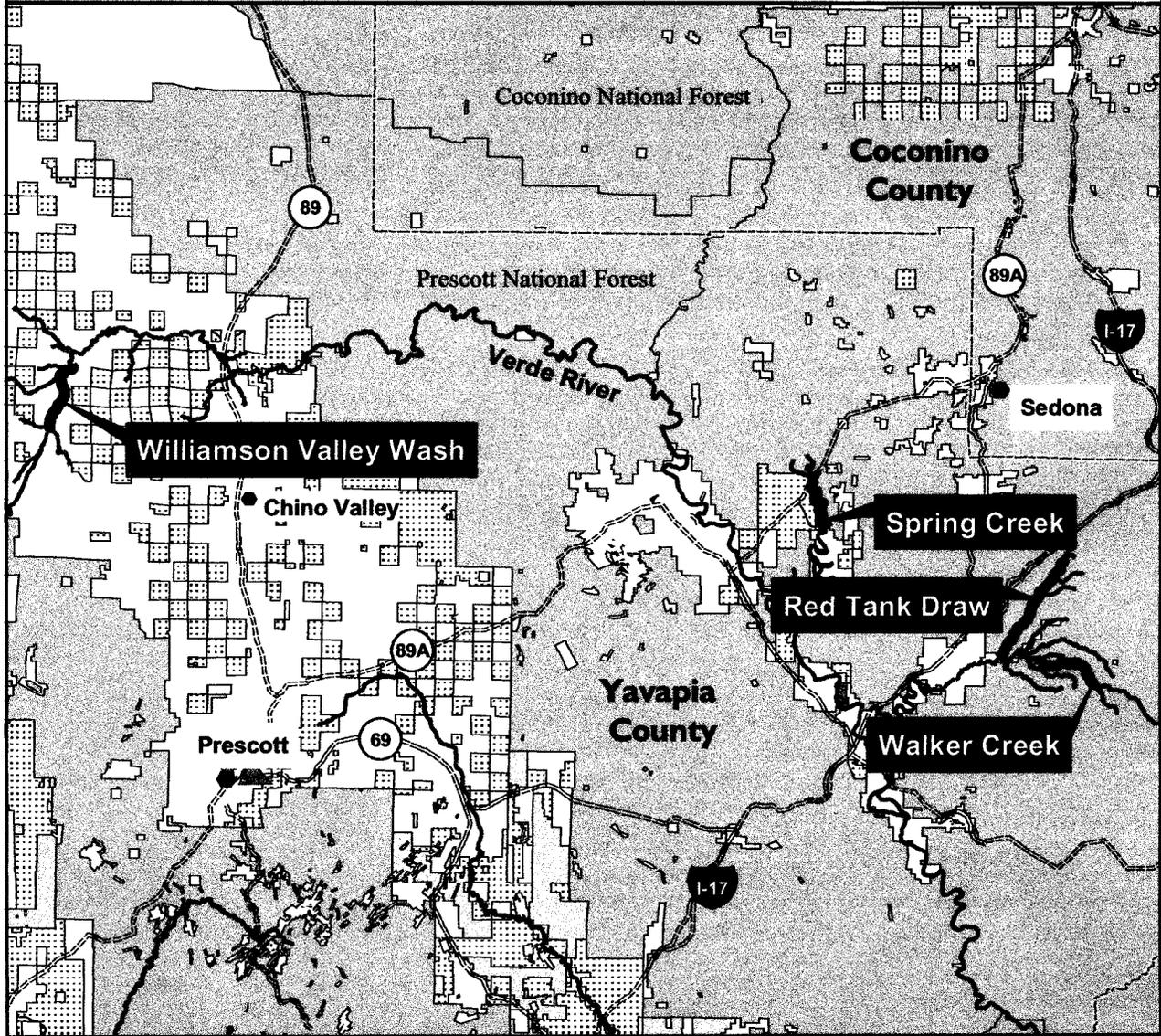
Forest Service land continuing upstream to the AZ. Highway 89A crossing in T. 16 N., R. 4 E., Section 16 SE ¼.

Land ownership: Coconino National Forest, Arizona State land, and private

d. Williamson Valley Wash—6.8 km (4.2 mi) of creek extending from the gaging station in T. 17 N., R. 3 W., Section 7 SE ¼ upstream to the crossing of the Williamson Valley Road in T. 17 N., R. 3 W., Section 36 NE ¼.

Land ownership: Private

General Location of Proposed Gila Chub Critical Habitat Area 6: Upper Verde River



Legend			
	Proposed Critical Habitat		BLM
	Rivers & Streams		Forest Service
	Major Roads		Indian Reservation
	AZ Counties		Private
			State

Area Enlarged

Use Constraints: This map is a graphical representation of Gila Chub (*Gila intermedia*) proposed critical habitat and is provided for illustrative purposes only. Refer to the legal descriptions in the regulation for the precise legal description of critical habitat. The map and the GIS coverages used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



Agua Fria River Area 7

a. Little Sycamore Creek—1.2 km (0.75 mi) of creek extending from the confluence with Sycamore Creek in GSRM T. 11 N., R. 4 E., Section 6 NE $\frac{1}{4}$ upstream to the Horner Mountain Ranch in T. 11 N., R. 4 E., Section 5 NW $\frac{1}{4}$.

Land ownership: Prescott National Forest and private

b. Sycamore Creek—18.5 km (11.5 mi) of creek extending from Rock Bottom Box and the confluence of an unnamed tributary in GSRM T. 11 N., R. 4 E., Section 23 SE $\frac{1}{4}$ upstream to Nelson Place Spring in T. 11 N., R. 5 E., Section 21 NE $\frac{1}{4}$.

Land ownership: Prescott National Forest and private

c. Indian Creek—5.3 km (3.3 mi) of creek extending from T. 11 N., R. 3 E., Section 26 SW $\frac{1}{4}$ on the section boundary of the SE $\frac{1}{3}$ of Section 26 next to the SW $\frac{1}{4}$ of Section 35 continuing upstream to the western boundary of Section 30 in T. 1 N., R. 4 E., Section 30 NE $\frac{1}{4}$.

Land ownership: Prescott National Forest and Bureau of Land Management

d. Silver Creek—6.7 km (4.2 mi) of Creek extending from T. 10 N., R. 3 E., Section 11 SW $\frac{1}{4}$ corner continuing upstream to the spring in T. 10 N., R. 4 E., Section 4 SW $\frac{1}{4}$.

Land ownership: Tonto National Forest and Bureau of Land Management

e. Larry Creek—approximately 0.67 km (0.42 mi) upstream from the

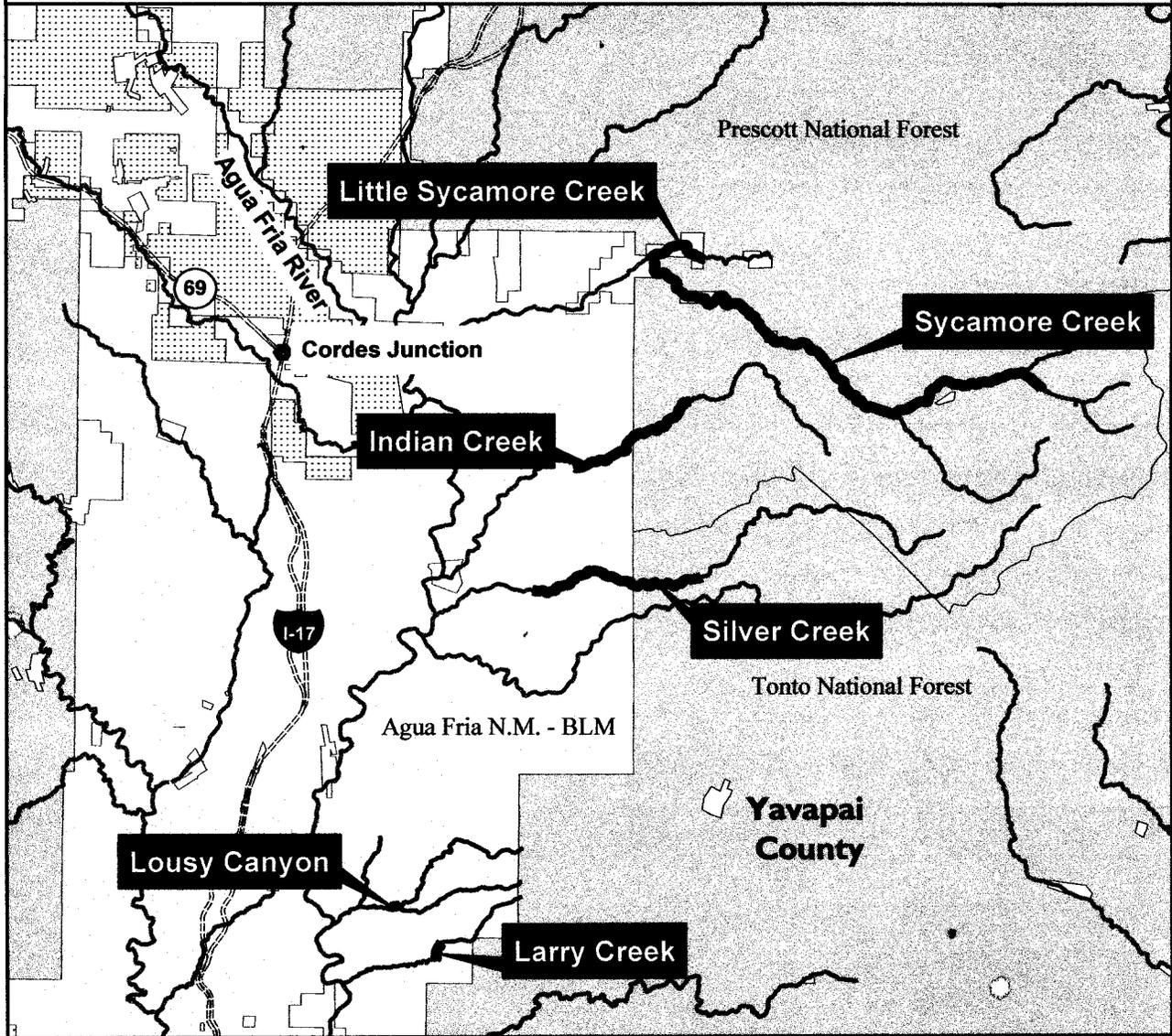
confluence with the Agua Fria River at the confluence of an unnamed tributary in T. 9 N., R. 3 E., Section 9 NW $\frac{1}{4}$, continuing upstream .80 km (0.5 mi) to the confluence of two adjoining unnamed tributaries in T. 9 N., R. 3 E., Section 9 NW $\frac{1}{4}$.

Land ownership: Bureau of Land Management

f. Lousy Canyon—beginning 0.28 km (0.18 mi) upstream from the confluence with the Agua Fria River at the waterfall in T. 9 N., R. 3 E., Section 5 NW $\frac{1}{4}$ then continuing upstream to the fork with an unnamed tributary approximately 1.2 km (.75 mi) of total stream.

Land ownership: Bureau of Land Management

General Location of Proposed Gila Chub Critical Habitat Area 7: Agua Fria River



Legend	
	Proposed Critical Habitat
	Rivers & Streams
	Major Roads
	BLM
	Forest Service
	Private
	State

Use Constraints: This map is a graphical representation of Gila Chub (*Gila intermedia*) proposed critical habitat and is provided for illustrative purposes only. Refer to the legal descriptions in the regulation for the precise legal description of critical habitat. The map and the GIS coverages used to create this map are not the definitive source for determining critical habitat boundaries. While the Service makes every effort to represent the critical habitat shown on this map as completely and accurately as possible, the USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.



2. Within these areas, the primary constituent elements are the following:

a. Perennial pools, areas of higher velocity between pool areas, and areas of shallow water among plants or eddies all found in small segments of headwaters, springs, or cienegas of smaller tributaries.

b. Water temperatures for spawning ranging from 20 to 26.5 degrees Celsius (68 to 79.7 degrees Fahrenheit) with sufficient dissolved oxygen, nutrients, and any other water-related characteristics needed.

c. Water quality with reduced levels of contaminants or any other water quality characteristics, including excessive levels of sediments, adverse to Gila chub health.

d. Food base consisting of invertebrates, filamentous (threadlike) algae, and insects.

e. Sufficient cover consisting of downed logs in the water channel, submerged aquatic vegetation,

submerged large tree root wads, undercut banks with sufficient overhanging vegetation, large rocks and boulders with overhangs.

f. Habitat devoid of nonnative aquatic species detrimental to Gila chub or habitat in which detrimental nonnatives are kept at a level that allows Gila chub to continue to survive and reproduce. For example, the Muleshoe Preserve and Sabino Canyon Gila chub populations are devoid of nonnative aquatic species. The O'Donnell Canyon Gila chub population has continued to survive and reproduce despite the current level of nonnative aquatic species present.

g. Streams that maintain a natural unregulated flow pattern including periodic natural flooding. An example is Sabino Canyon, which has experienced major floods. If flows are modified, then the stream should retain a natural flow pattern that demonstrates an ability to support Gila chub.

3. Lands located within the exterior boundaries of the proposed critical habitat designation, but not considered critical habitat and are excluded by definition include: existing paved roads; bridges; parking lots; dikes; levees; diversion structures; railroad tracks; railroad trestles; water diversion canals outside of natural stream channels; active gravel pits; cultivated agricultural land; and residential, commercial, and industrial developments. These developed areas do not contain any of the primary constituent elements and do not provide habitat or biological features essential to the conservation of the Gila chub, and generally will not contribute to the species' recovery.

Dated: July 31, 2002.

Craig Manson,

Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 02-19872 Filed 8-8-02; 8:45 am]

BILLING CODE 4310-55-P