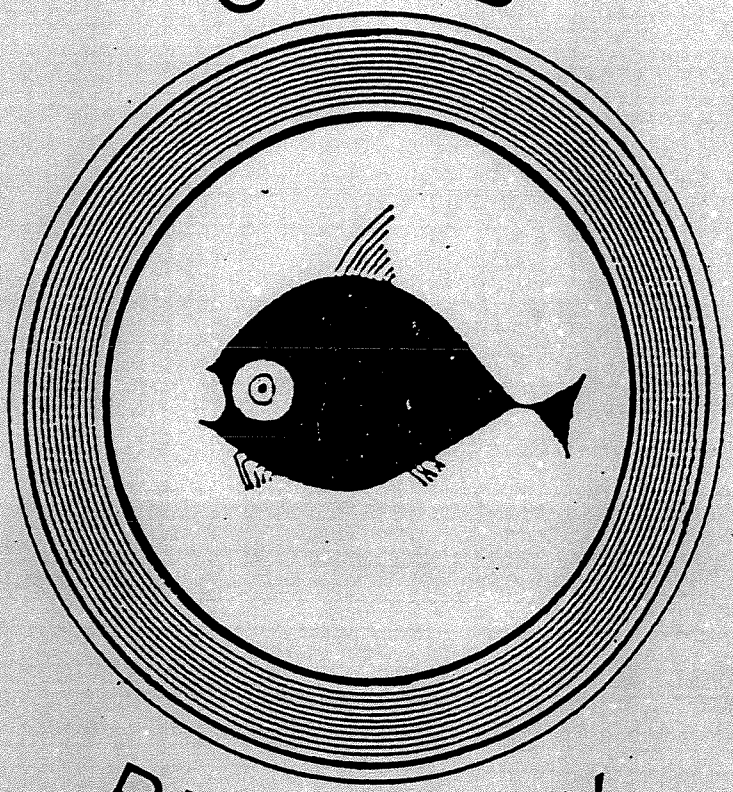
CHIHUAHUA CHUB



RECOVERY PLAN

U.S. FISH & WILDLIFE SERVICE

DEPARTMENT OF THE INTERIOR

1986

RECOVERY PLAN

FOR

CHIHUAHUA CHUB

Gila nigrescens (Girard 1856)

Prepared by

U.S. Fish and Wildlife Service

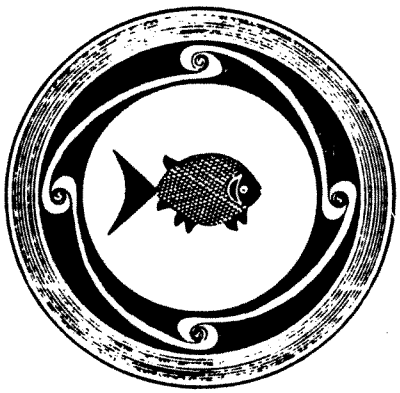
Office of Endangered Species, Region 2

Albuquerque, New Mexico

Approved:

By: _____
Regional Director
U.S. Fish and Wildlife Service
Region 2

Date 4/14/86



DISCLAIMER

This is the completed Chihuahua Chub Recovery Plan. It has been approved by the U.S. Fish and Wildlife Service. It does not necessarily represent official positions or approvals of cooperating agencies (and it does not necessarily represent the views of all recovery team members/individuals), who played the key role in preparing the plan. This plan is subject to modification as dictated by new findings and changes in species status and completion of tasks described in the plan. Goals and objectives will be attained and funds will be expended contingent upon appropriations, priorities, and other budgetary constraints.

Literature citation should read:

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ACKNOWLEDGMENTS

This recovery plan is based upon a management plan written by Michael D. Hatch and John P. Hubbard, Biologists, Endangered Species Project, New Mexico Department of Game and Fish. The management plan entitled Management Plan for the Chihuahua Chub, Gila nigrescens (Girard, 1856) in New Mexico was completed January 25, 1980, and was written in the basic format of a recovery plan. The U.S. Fish and Wildlife Service is appreciative of the fine effort of Mr. Hatch and Dr. Hubbard in preparing the management plan upon which this recovery plan is based.

Fish designs found on the cover and throughout the Plan come from prehistoric Mimbres Indian pottery. The Mimbres Indians occupied the Mimbres River Valley from AD200 until around AD1150 and co-existed with the Chihuahua chub. Why designs of fish were so often used on Mimbres Indian burial bowls is not known. Of those bowls depicting animals, approximately one-third display fish.

SUMMARY

1. GOAL

To remove the Chihuahua chub from the Federal list of Endangered and Threatened species by restoring them as a secure, stable and self-sustaining species within the Mimbres River of New Mexico.

2. RECOVERY CRITERIA

Delisting of the Chihuahua chub will be considered when (1) conservation easements or other legal agreements have been obtained on the spring-fed tributary where the fish presently exist, and (2) two additional secure populations are successfully established within its former range on the Mimbres River.

3. ACTION NEEDED

Steps needed to meet recovery criteria include:

1. Provide habitat protection on areas where the Chihuahua chub presently exists or where suitable habitat can be reclaimed.

2. Reclaim two habitats where Chihuahua chub can be reintroduced.

3. Reintroduce Chihuahua chub into reclaimed habitats and monitor those populations to determine success of the reintroduction.

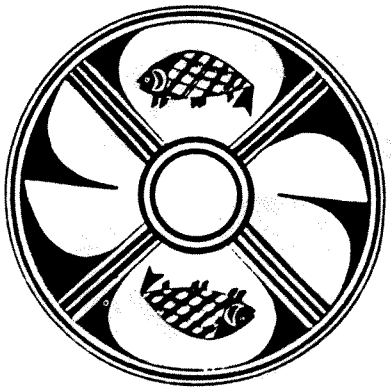
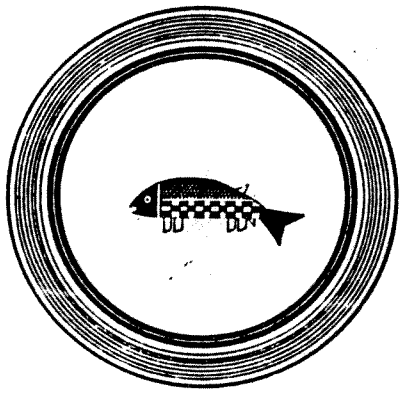


TABLE OF CONTENTS



PART I

INTRODUCTION

The genus Gila comprises a group of minnows, commonly called chubs, that are generally restricted to western drainages of North America, especially within the Colorado River Basin. Many of the chubs in the genus are restricted in their distribution or are otherwise vulnerable in terms of their survival. Presently 18 species or subspecies are considered endangered, threatened, or are of special concern (Deacon et al. 1979). The Chihuahua chub (Gila nigrescens) is a restricted species that is listed as threatened at the Federal level and is treated as endangered by the State of New Mexico (N.M.D.G.& F. Reg. No. 599). This recovery plan provides a systematic means to recover the Chihuahua chub in its United States range (New Mexico). The plan may also prove useful in helping preserve this species in Mexico (Chihuahua), where the major portion of its range exists and where it has also declined (Miller and Chernoff 1979).

Nomenclature

The Chihuahua chub was originally described from the Mimbres River (Luna or Grant County), New Mexico, by Baird and Girard (1854) and assigned the name Gila pulchella. Subsequent names applied to the species include: Tigoma nigrescens Girard, 1856; and Tigoma nigrescens Jordan and Evermann, 1896.

Due to taxonomic revision of the genus Gila, a conflict with homonyms developed, and the present name Gila nigrescens was adopted, with the Rio Janos at Boca Grande, Chihuahua, Mexico, recognized as the type locality. While the name Gila nigrescens has also been applied by various authors (e.g. Jordan 1891; Koster 1957) to the chub that resides in the Rio Grande and Pecos drainages, that species (the Rio Grande chub, Gila pandora) is quite distinct and should not be confused with the true G. nigrescens of the Guzman drainage.

General Description

The Chihuahua chub averages 5-6 inches in length at maturity and may reach 12 inches. The origin of the dorsal fin is behind that of the pelvic fin (as is typical in Gila) and the dorsal fin ray count is usually 9. There are usually 67-78 scales in the lateral line. Coloration is dusky brown above and whitish below. During the breeding season an orange-red color develops around the mouth and lower fins, and on more colorful individuals this also occurs on the pelvic and pectoral fins and lower sides of the head and body. Post-larval G. nigrescens are characterized by a spot above the lateral line, immediately preceding the caudal fin.

Distribution and Status

The Chihuahua chub is endemic to the Guzman Basin, where it occurs from the Mimbres River in New Mexico (Fig. 1), southward to northwestern Chihuahua, Mexico (Fig. 2).

The chub was first collected in 1851 from the Rio Mimbres by a member of the United States and Mexican Boundary Survey (Baird and Girard 1854). Following that, the species was not observed in the Mimbres again until June 5, 1975, when Bill Rogers (1975) discovered approximately 20 chubs and collected two "1/4 mile upstream of Bear Canyon Reservoir", Grant County, New Mexico (Fig. 1). Within the Mimbres drainage, the chub is presently confined to a reach of river extending from Allie Canyon downstream to a point opposite the Mimbres Post Office and a small, privately owned, springfed tributary located on the east side of the Mimbres River, opposite Bear Canyon Reservoir. This relict population represents the species' only natural occurrence in the United States. The species is presently found only on private lands.

In Chihuahua, the species was formerly known from at least 15 different localities. However, during a 1979 survey in which these localities were revisited, only 7 (Fig. 2) were found to be occupied by the chub and only 3 had "healthy" populations (Miller and Chernoff 1979).

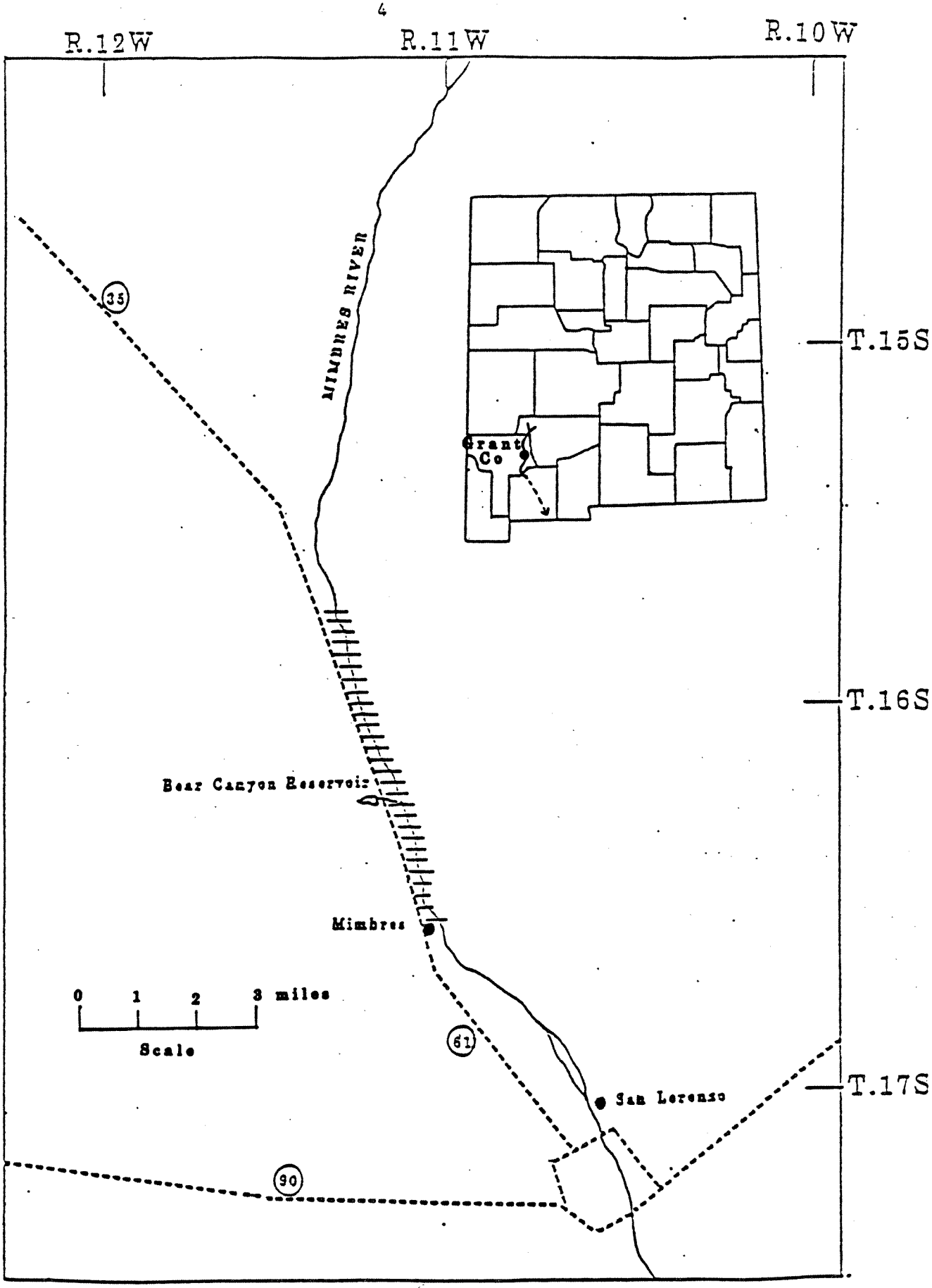


Figure 1 - Present distribution of the Chihuahua chub in the Mimbres River, New Mexico, ////// represents approximate location of Chihuahua chub.

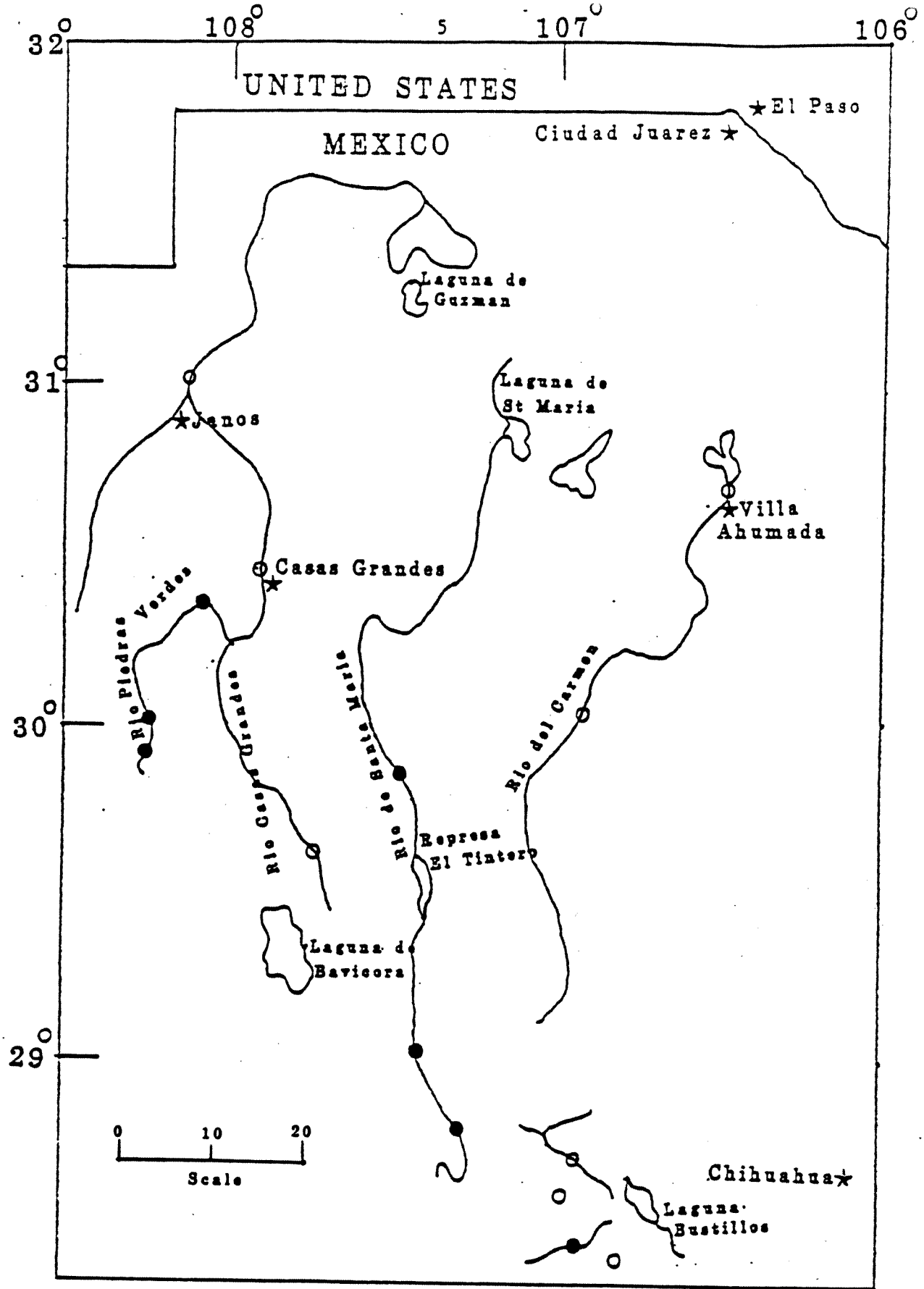


Figure 2 - Present distribution of the Chihuahua Chub in Mexico. Solid circles represent distribution as of 1979, open circles represent sites occupied prior to 1979.

Biology

The Chihuahua chub is dependent upon habitat comprised of deep pools with undercut banks or over-hanging vegetation. This habitat type provides both escape cover and a suitable foraging situation. Chubs are rather trout-like in much of their feeding, taking terrestrial insects on the surface as well as aquatic invertebrates and perhaps some fish and vegetation. Chihuahua chubs spawn in the Mimbres River in late April and May. Spawning is believed to take place in quiet pools approximately 3 to 7 feet in depth over matted beds of aquatic vegetation. At Dexter National Fish Hatchery highest reproductive success was achieved in ponds where gravel beds were provided.

Presently, six species of native fishes are known to inhabit the waters of the Guzman Basin: the Chihuahua chub, Rio Grande mountain sucker (Catostomus plebius), fathead minnow (Pimephales promelas), beautiful shiner (Notropis formosus), Mexican stoneroller (Campostoma ornatum), and an undescribed pupfish (Cyprinodon sp.). Except for the pupfish, these species are usually found in association with G. nigrescens. However, in the Mimbres drainage of New Mexico; the Mexican stoneroller was apparently never present, and the beautiful shiner has been extirpated. Exotic species which have been reported occurring with G. nigrescens in Mexico include the carp (Cyrprinus carpio) and black bullhead (Ictalurus melas) (Robert Miller pers. comm.), rainbow trout (Salmo gairdneri) and longfin dace (Agosia

chrysogaster). Two additional exotic species, the speckled dace (Rhinichthys osculus) and the Gila trout (Salmo gilae) occur in the Mimbres drainage in New Mexico, but neither occurs with the chub.

Oldtimers in the Mimbres Valley angled for the Chihuahua chub, which was locally known as "Gila trout". It is likely that the ancient Mimbres Indians took Chihuahua chubs as food, as their pottery depicts fish that resemble the species. In fact, judging from pottery motifs, it would appear that the Mimbres River once supported a notably greater diversity of species, including catfish (Ictalurus) and gar (Lepisosteus). This would have been seven or more centuries ago, when the river was more stable.

According to a report by Emory (1848), fish identified as trout (Salmo sp.) historically occupied the Mimbres River, New Mexico and presumably coexisted with the chub there and in other waters of the Guzman Basin. Unfortunately, the validity of this record is uncertain, as Emory did not obtain any specimens, and no native salmonid has ever been taken in any water of the Guzman Basin. However, Dr. Robert Miller of the University of Michigan, has studied the fishes of the Guzman Basin extensively and feels that Emory's report is reliable. Furthermore, he suspects that a native salmonid may exist or have existed in the Guzman Basin in Mexico.

Conservation

Annually New Mexico Department of Game and Fish biologists have been monitoring the distribution and abundance of the Chihuahua chub in the Mimbres River since its rediscovery there in 1975. The survey is done by using seins and backpack electroshockers. The U.S. population of the Chihuahua chub is generally restricted to the Mimbres River between Allie Canyon and the Mimbres Post Office. Within this area, the specific areas occupied by the species have changed with the variation of flow regimes, particularly flood events. Until late 1978, the species was represented by no more than 30-40 adult fish. The severe flooding of late 1978 and early 1979 displaced some chubs downstream, and these individuals were lost from the population. Subsequent inventories have revealed that the population of chubs presently consists of no more than 150 adults.

Because of the extremely low population number, and the destructive post-flood reclamation work on the river, 10 chubs were placed in Dexter National Fish Hatchery on March 17, 1979. These fish have reproduced successfully and it is hoped that they will preserve the gene pool and provide fish for future transplants into the Mimbres River. Several Chihuahua chubs from a population in the Rio Piedras Verdes, Chihuahua, were also placed in Dexter National Fish Hatchery in 1979. Efforts will be made to study these fish to determine if they are genetically and morphologically the same as the Mimbres stock. This group of

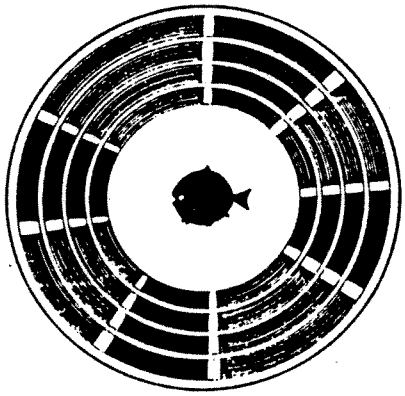
chubs has also reproduced successfully at Dexter. Care has been taken to isolate the Mimbres stock from the Rio Piedras Verdes stock at Dexter, as it is not known if morphological or genetic differences exist between these fish.

Reason for Decline

The decline of the Chihuahua chub in the Mimbres River appears to be primarily related to loss of habitat. This loss has been due to severe flooding caused by degradation of the watershed and loss of riparian vegetation, and to action taken by local landowners to protect their property from future flooding. The Mimbres River has been channelized and leveed by local landowners in an effort to confine flood waters. As a result, chub habitat has been destroyed. The work has not been effective or enduring, and must be repeated each spring at or near the time the chub spawns, making these activities especially detrimental.

That more and better habitat existed in the past is apparent from the accounts of Antisell (1856) and from the testimony of local residents. The former described the terminus of the river in the 1850's as being a series of pools or lagoons, surrounded by thickets of willows (Salix ssp.); for 4 to 6 miles above this point the river is said to have been up to 2 1/2 feet deep and to have flowed at 2 1/2 miles per hour in the summer. Today, the river terminus is usually dry. Diversions have reduced the quantity of water in the river, while uneven flows, flooding, and repeated stream modifications by local landowners have combined

to eliminate the conditions described by Antisell (1856). The introduction of exotic species such as rainbow trout (Salmo gairdneri) and longfin dace (Agosia chrysogaster) probably led to predation on and competition with the chub. However, these factors probably played a minor role in the declining status of the chub compared to the influence of loss of habitat.



PART II

RECOVERY

Step-down Outline

Prime Objective: To improve the status of the Chihuahua chub in New Mexico to the point that its survival is secured through viable populations established and maintained in the wild.

1. Maintain and enhance the existing chub population and its habitat in the Mimbres Valley.

11. Monitor the Chihuahua chub and its habitat.

12. Reclaim and perpetuate habitat essential to the Chihuahua chub.

121. Determine perferred chub habitat.

122. Provide flood protection which is consistent with the needs of the chub.

123. Recreate chub habitat.

124. Provide protection for and enhance existing habitat in the lateral spring-fed tributary and other suitable habitats.

13. Regulate human activities.

131. Ban the introduction of non-native fish into Chihuahua chub habitat.

132. Prohibit taking minnows for bait purposes.

133. Provide permanent irrigation diversions which are consistent with the needs of the chub.

2. Hold and propagate the Chihuahua chub in a hatchery.

3. Determine the genetic/taxonomic relationship of U.S. and Mexican Chihuahua chubs.

4. Reestablish the Chihuahua chub within its former range in New Mexico where suitable habitat presently exists or can be created and maintained and monitor reintroductions.

5. Disseminate information about the Chihuahua chub.

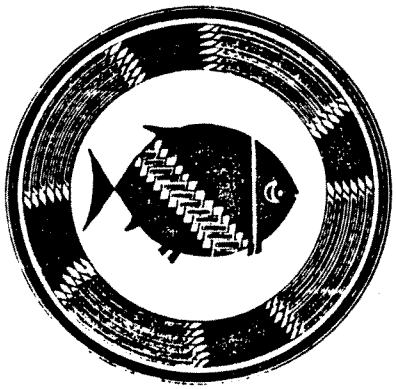
51. Public information.

511. Local and State.

512. National and international.

513. International cooperation.

52. Professional information.



Narrative

Prime Objective: To improve the status of the Chihuahua chub in New Mexico to the point that survival is secured through viable populations established and maintained in the wild. Delisting of the Chihuahua chub will be considered when (1) conservation easements or other legal agreements have been obtained on the spring-fed tributary where the fish presently exist, and (2) two additional secure populations are successfully established within its former range on the Mimbres River.

1. Maintain and enhance the existing chub population and its habitat in the Mimbres Valley.

Steps should be taken to maintain and enhance the existing Chihuahua chub population and its habitat.

11. Monitor the Chihuahua chub and its Habitat.

Chihuahua chub population(s) and habitat must be monitored on a long-term basis. The monitoring must focus on numbers, structure of the populations, and condition of the habitat. Should any of these or other factors suggest a decline in the population or degradation of the habitat, causative agents must be identified and remedied.

Any proposed activity within the Mimbres watershed which adversely affects the chub or its habitat must be stopped and replaced by biologically acceptable alternatives. Examples would include introduction of exotic fish and activities in the areas of reclamation, road construction, grazing, logging, cropland irrigation, and the use of chemical agents. Activities that may negatively affect the survival or maintenance of the chub population should be permitted only after being critically reviewed.

12. Reclaim and perpetuate habitat essential to the Chihuahua chub.

The natural stream configuration of the Mimbres River has been extensively altered due to severe flooding and action taken by local landowners to protect themselves from such events. The resultant straight, shallow, and levee-lined channel is not acceptable habitat for the chub. In order to restore habitat for the species, other provisions will have to be made to protect landowners property from flooding.

121. Determine perferred chub habitat.

Studies should be conducted in both the field and the laboratory to attempt to describe more exactly

the perferred habitat of the Chihuahua chub in relation to that which is available. Without this information it may not be possible to undertake any long lasting habitat restoration.

122. Provide flood protection which is consistent with the needs of the chub.

Consult engineers on construction of levees which can provide adequate flood protection in the area without adversely affecting the chub or its habitat. Care should be taken to place the levees far enough away from the stream so that non-damaging flows are not unduly constricted or otherwise altered. Under these conditions, normal stream behavior will aid in restoring the river to something approaching its historic configuration of deep pools with undercut banks (ideal habitat for the chub).

Conventional levee construction in close proximity to the remaining relicit chub population will have detrimental impacts by increasing flood flow velocities and further eroding the substrate. However, the development of a combined plan of flood protection and habitat enhancement for the chub is feasible. The initial elements of such a

plan have been pursued with technical assistance from the U.S. Army Corps of Engineers. Fill material used for levee construction should be from sites away from the stream to avoid disturbance to existing habitat. Debris from earlier flooding and from levee and channelization efforts should be removed. On-site work should be restricted to small earth moving equipment and hand labor. Supervision and administration of the actual construction should be shared by persons with biological and engineering expertise.

123. Recreate chub habitat.

Pools 3 to 7 feet in depth should be excavated adjacent to, and confluent with the main river to provide suitable habitat for the chub and to speed the habitat reclamation process. These pools should be situated in such a manner that they will be perpetuated by natural stream behavior. The excavated earth that accumulates during pool construction can be used in levee construction.

124. Provide protection for and enhance existing habitat in the lateral spring-fed tributary and other suitable habitats.

The lateral spring-fed tributary located on the east side of the Mimbres River opposite Bear Canyon Reservoir serves as a natural refuge for the species. Preservation of this habitat is essential if the species is to be maintained in the wild. Habitat protection must be sought by either the U.S. Fish and Wildlife Service or the New Mexico Department of Game and Fish with the landowner(s) and preferably, in cooperation with The Nature Conservancy. In addition, the spring habitat can be enhanced by increasing the number and depth of pools. Pools 3 to 7 feet deep could be created in the area by excavating and/or installing small log dams which could be negotiated by the fish. Such actions should be done carefully and in such a way as to avoid negative impacts on the chubs.

landowner had to sell

All streams within the Mimbres drainage have been surveyed and their suitability as restoration sites has been evaluated. Three areas (Fig. 3) have been identified in which to reintroduce the species: (1) the Mimbres River in the box canyon below the Cooney Place (T. 15 S., R. 11 W., Sec.

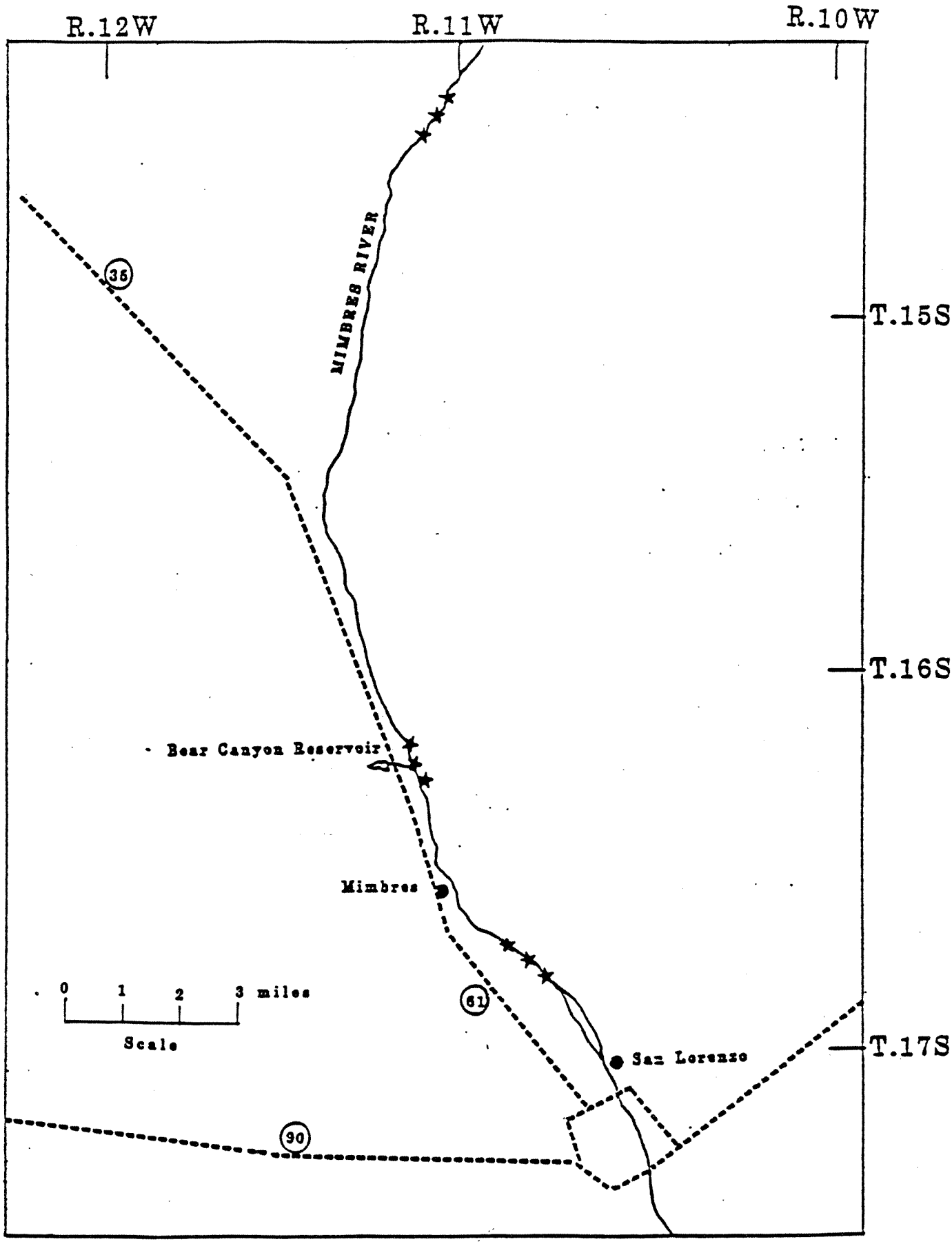


Figure 3 - ★ ★ ★ Chihuahua Chub restoration sites.

24, 35, 38, and 9); (2) the Mimbres River within the area (T. 16 S., R. 11 W. Sec. 20, 28, and 33); (3) the New Mexico Department of Game and Fish property about 3 miles upstream of San Lorenzo (T. 17 S., R. 11 W., Sec 10 and 11).

13. Regulate human activities.

Human activities in the proximity of Chihuahua chub habitat could adversely impact the species. When possible, these activities should be regulated to minimize such effects. These regulations should be posted in areas as appropriate.

131. Ban the introduction of non-native fish into Chihuahua chub habitat.

It is important to prohibit introduction of exotic fish into the Mimbres River to prevent competition, predation, and/or hybridization. One means to this end is to prohibit the use of bait fish in any portion of the Mimbres drainage. Presently, the State of New Mexico prohibits the use of bait minnows in the Mimbres Drainage downstream to the highway 90 crossing, except in Bear Canyon Reservoir

where their use is legal (N.M.G.F. Regulation No. 595). In addition, planting of game fish, mosquitofish, bullfrogs, and other species by agencies must be closely regulated if not discontinued. Management of the fisheries in the upper Mimbres River and in Bear Canyon Reservoir must be made as compatible as possible with preservation of the Chihuahua chub and its habitat, and conflicts must be resolved in favor of the chub.

132. Prohibit taking minnows for bait purposes.

Identification of Chihuahua chubs, particularly young, is difficult. Therefore, to prevent inadvertent procurement of Chihuahua chubs for bait, the taking of any fish for this purpose must be prohibited in the Mimbres drainage. This closure should remain in effect indefinitely.

133. Provide permanent irrigation diversions which are consistent with the needs of the chub.

Legal agreements needs to be reached with

local irrigators concerning construction and maintenance of irrigation diversions dams.

The annual establishment and constant maintenance of push-up irrigation diversions within the Mimbres River increase silt loads and otherwise disturb chub habitat. Long-term solutions to the diversion problem should be provided to help perpetuate the desired habitat of the chub. Therefore, permanent diversions that do not interfere with the movements of fish and that do not dewater downstream habitats should replace the present diversions within the area occupied by the chub. Once these permanent diversions are provided, local landowners would be expected to abstain from stream modifications for irrigation purposes.

2. Hold and propagate the Chihuahua chub in a hatchery.

The propagation stock at Dexter National Fish Hatchery should be maintained to provide offspring for stocking purposes and to maintain a reserve gene pool, should the natural population become extirpated. Production should be encouraged to provide for maximum numbers of fish for restocking. To maintain genetic integrity of the species,

the stock at Dexter NFH should be supplemented every two years with wild Chihuahua chub.

3. Determine genetic diversity

The genetic diversity between the United States and Mexican populations of Chihuahua chub should be determined.

4. Reestablish the Chihuahua chub within its former range in New Mexico, where suitable habitat presently exists or can be created and maintained and monitor reintroductions.

Reintroductions into high priority areas should proceed using stocks available from propagation efforts at Dexter National Fish Hatchery. Other sites within the drainage of Mimbres River may be suitable for reintroductions and may be used if habitat improvements are made. These sites include Gallina and McKnight Creeks. Transplanted stocks should be monitored to document reproductive success and population parameters.

5. Disseminate information about the Chihuahua chub.

Information concerning the Chihuahua chub should be disseminated to provide both understanding of the species and to promote support for the recovery effort.

51. Public information.

Besides providing basic information on the species, a good public information program can encourage public support for expanding the Chihuahua chub in its historic range and increasing compliance with management programs.

511. Local and State.

Information should be disseminated to reach as large and varied a public audience as possible. Media to be used include newspapers, fishing proclamations, magazines, radio, and television.

512. National and international.

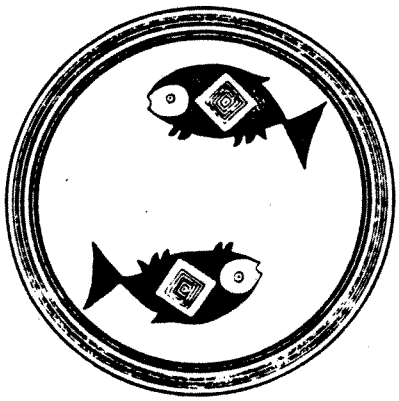
Information concerning the Chihuahua chub should also be supplied to media with national and international circulation.

513. International cooperation.

Encourage Mexico through diplomatic channels to give protection to their populations of chub.

52. Professional Information.

Technical information should be made available through scientific journals, agency reports, and regulations concerning the species.



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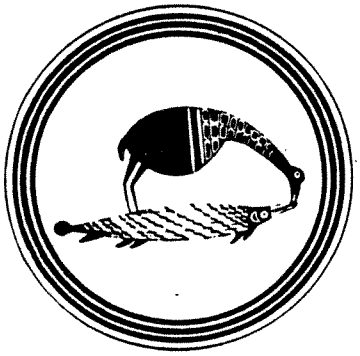

PART III

IMPLEMENTATION SCHEDULE

Definition of Priorities

Priority 1 - Those actions that are absolutely essential to prevent the extinction of the species in the foreseeable future.

Priority 2 - Those actions necessary to maintain the species' current population status.

Priority 3 - All other actions necessary to provide for full recovery of the species.

General Categories for Implementation Schedules

Information Gathering - I or R (research)

1. Population status
2. Habitat status
3. Habitat requirements
4. Management techniques
5. Taxonomic studies
6. Demographic studies
7. Propagation
8. Migration
9. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. Other information

Acquisition - A

1. Lease
2. Easement
3. Management agreement
4. Exchange
5. Withdrawal
6. Fee title
7. Other

Management - M

1. Propagation
2. Reintroduction
3. Habitat maintenance and manipulation
4. Predator and competitor control
5. Depredation control
6. Disease control
7. Other management

Other - O

1. Information and education
2. Law enforcement
3. Regulations
4. Administration

PART III - IMPLEMENTATION SCHEDULE

GENERAL CATEGORY (1)	PLAN TASK (2)	TASK # (3)	PRIORITY # (4)	TASK DURATION (5)	RESPONSIBLE AGENCY FWS REGION (6)	FWS PROGRAM (6a)	OTHER (7)	FISCAL YEAR COSTS (EST.)* FY-1 (8)	FY-2	FY-3	COMMENTS (9)
I-1,2	Monitor chubs and chub habitat	11	2	Ongoing	2	SE FR	NMG&F†	1,000	1,000	1,000	
R-3	Determine perferred chub habitat	121	3	2 years	2	SE RE	NMG&F	5,000	5,000		contract possible
M-3	Provide flood protection consistent with habitat need for the chub	122	2	3 years	2	SE	CE**	1,000	1,000	1,000	
M-3	Recreate chub habitat	123	3	2 years	2	SE	CE NMG&F	10,000	10,000		
A-2 M-3	Provide protection and enhance existing habitats	124	1	3 years	2	SE	NMG&F	50,000	30,000	10,000	a privat group suc as The Nature Conservan may take part

* Costs refer to USFWS expenditures only
† New Mexico Department of Game and Fish
** Corps of Engineers

PART III - IMPLEMENTATION SCHEDULE

GENERAL CATEGORY (1)	PLAN TASK (2)	TASK # (3)	PRIORITY # (4)	TASK DURATION (5)	RESPONSIBLE AGENCY FWS REGION (6)	RESPONSIBLE AGENCY FWS PROGRAM (6a)	RESPONSIBLE AGENCY OTHER (7)	FISCAL YEAR COSTS (EST.)* FY-1 (8)	FY-2	FY-3	COMMENTS (9)
O-3	Ban the introduction of non-native fish	131	2	Ongong	2	SE LE	NMG&F	1,000	1,000	1,000	
O-2	Prohibit taking minnows for bait	132	2	Ongoing	2	SE LE	NMG&F	1,000	1,000	1,000	
M-3	Provide irrigation diversions which are consistent with chub needs	133	3	2 years	2	SE	NMG&F CE	?	?		cost dependent upon engineering study needs
M-1	Hold and propagate chubs in a hatchery	2	1-3	Ongoing	2	SE FR		5,000	5,000	5,000	

* Costs refer to USFWS expenditures only
† New Mexico Department of Game and Fish
** Corps of Engineers

PART III - IMPLEMENTATION SCHEDULE

GENERAL CATEGORY (1)	PLAN TASK (2)	TASK # (3)	PRIORITY # (4)	TASK DURATION (5)	RESPONSIBLE AGENCY FWS REGION (6)	FWS PROGRAM (6a)	OTHER (7)	FISCAL YEAR COSTS (EST.)* FY-1 (8)	FY-2	FY-3	COMMENTS (9)
R-5	Determine genetic taxonomic relationships	3	3	1 year	2	SE		5,000			potential contract
M-2	Reestablish and monitor the chub	4	3	5 years	2	SE FR	NMG&F	6,000	6,000	6,000	
O-1	Disseminate information	5	3	Ongoing	2	SE		5,000	500	500	contract production of a pamphlet and video

* Costs refer to USFWS expenditures only
† New Mexico Department of Game and Fish
** Corps of Engineers

PART IV

COMMENTS AND RESPONSES

Letters of comment on this plan have been reproduced in this section, followed by an outline of the responses made to each comment.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

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In Reply Refer To:
FWS/OES

NOV 19 1985

Memorandum

To: Regional Director, Region 2 (ARD/AFF)
Acting Associate
From: Director

Subject: Review of the Chihuahua Chub Recovery Plan - Agency Draft

We have reviewed the subject plan and wish to commend your efforts on a well written draft. Editorial comments are provided in the margins of the draft (attached).

Specific comments are as follows:

A-1 1. Page 3, third paragraph: Reference is made to the species being found in "at least 20 different streams." The map on page 5 fails to show all 20 locations.

A-2 2. Page 4: The map is misleading in that the Mimbres River appears to enter Mexico. If possible, use a solid line leading into several dashes to indicate that the river terminus is dry.

A-3 3. Page 6, first paragraph: Reference is made to annual stream channelization and levee construction. Please identify if the activities are Federal, State, or private actions. If any Federal actions are involved, e.g., funding or permits, Section 7 consultation must be conducted.

Second paragraph: Describe the land ownership along the river. Who is responsible for the habitat?

A-4 4. Page 7, Biology and page 9, Conservation: These sections fail to discuss the Mexican population of Gila nigrescens. Any information available, e.g., population numbers and threats, on the Mexican populations should be included.

A-5 5. Page 9, Conservation, first paragraph: How is the Mimbres River population of Chihuahua chubs being monitored, e.g., annual, seasonal, method of survey? Again, who is responsible for the habitat?

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Second paragraph: Reference is made to the Mexican (Rio Piedras) stock of Chihuahua chubs being propagated at Dexter National Fish Hatchery, but no mention is made as to the purpose of maintaining this captive population. Please discuss.

A-6 6. Page 10, Prime Objectives: Incorporate the wording of the Recovery Criteria, page iii, in this section.

A-7 7. Page 12, Prime Objectives: Same as above comment 6.

A-8 8. Page 13, Task 121: Consideration should be given to simulating habitats on a small scale in a laboratory to study the "preferred" habitat.

A-9 9. Page 18, Task 13: Regulate human activities: Restrictions listed under this task should be posted in areas as appropriate.

A-10 10. Page 20, Task 2: Hold and propagate the Chihuahua chub in a hatchery. This task should contain a subtask to study the genetics of the Mexican populations of Chihuahua chub.

A-11 11. Page 22: Add, "Task 413. Encourage Mexican protection of their native stock," to give special attention to the Mexican populations of chubs.

We hope these comments will be helpful in development of the final plan. If you disagree with any of the above comments, please let us know before the plan is put in final draft. Please provide the Office of Endangered Species, 500 Broyhill Building, 25 copies of the plan once it has been approved and printed.

Roman H. Kaenniger

Attachment

State of New Mexico

DEPARTMENT OF GAME AND FISH

STATE CAPITOL
SANTA FE
87503

End So. R-2	
JOHNSON	
LAWGOWSKI	
Bowman	
Burton	
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December 3, 1985

Michael Spear
Regional Director
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87103

Dear Mike;

My staff has reviewed the draft recovery plan for the Chihuahua chub that has been prepared by the Office of Endangered Species, and we believe that it addresses the major considerations for bringing about the recovery of this species. Given our limited knowledge of this fish, and its requirements, I expect there will be some modification of the plan as more information is acquired. Specific comments on the draft are as follows:

B-1 1). P. 4--locate Allie Canyon on the Mimbres River map.
B-2 2). P. 4--provide a distance scale for the map.
3). P. 5--provide a distance scale for the map.
4). P. 16--in addition to the two restoration locales recommended, the New Mexico Department of Game and
B-3 Fish has acquired property on the Mimbres River (about 5 km above the village of San Lorenzo, T17S R11W Sec 10 and 11) that would serve as a suitable site for the establishment of another Chihuahua chub population. I believe this stream reach should also be included in the recovery plan recommendations.
5). P. 26--Items O-2 and O-3 have costs of $1,000 per
B-4 year for 3 years. How will banning the introduction of bait minnows and prohibiting the taking of the same incur such costs?

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FWS-Region
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SE RD

Thank you for the opportunity to comment upon the Chihuahua chub recovery plan.

Sincerely,

Harold Olson

Harold F. Olson,
Director

dlp

United States Department of Agriculture
Forest Service
Region 3
517 Gold Avenue, SW
Albuquerque, NM 87102

Reply To: 2670

Date: NOV 26 1985

JOHNSON
LANGOWSKI
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CL 11-26

Michael J. Spear, Regional Director
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

Dear Mr. Spear:

Thank you for the opportunity to comment on the Draft Chihuahua Chub Recovery Plan. Our comments will be directed only toward suggested activities that may potentially affect National Forest System lands and will not address other items in the recovery plan. We have provided informal comments to you previous to this Agency review draft, and those comments on the technical aspects of the recovery plan still apply.

The draft provides a logical starting point to begin addressing overall recovery of this species. The stated goals and recovery criteria are clear and concise and we recommend that they be carried over into the prime objectives of the stepdown plan.

C-1 There are, however, a number of unanswered questions concerning planned activities. For example, it appears from the generalized recovery needs listed on pages 12 and 13 that existing activities (grazing, logging, road construction, etc.) within the Mimbres watershed could potentially be excluded without a thorough review of cause and effect relationships. We cannot agree to any plan that calls for, or even suggests, the complete cessation of major land uses and activities until these uses and activities have been demonstrated to have caused the decline of the species.

The Endangered Species Act directs us to carry out programs for the conservation of listed species and to ensure that our actions do not jeopardize the continued existence of any listed species. In determining causes of the decline of the species, each agency must use the best scientific data available. In the case of the Chihuahua chub, for which critical habitat was not declared, our permitted actions must be evaluated in terms of their effects on the species, and not in terms of their effects on the habitat. If any of our ongoing or proposed activities are found to be jeopardizing the species, we will work with you to determine ways of eliminating those detrimental effects.

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The draft plan addresses the need to determine preferred Chihuahua chub habitat, and we emphasize that this must be a primary step. Habitat information currently documented is only for adult chubs and then only for their cover requirements. Before Chihuahua chubs are placed into reclaimed habitat, or modifications are made in potential habitat, there must be a thorough analysis of the habitat requirements of the species, including velocity, substrate, depth, cover and temperature preferences for feeding and spawning sites, larval and juvenile life stages, and so forth.

We emphasize the need for detailed habitat information because we are reluctant to provide habitat that is marginal and will not sustain a viable population of fish, as has been the case for Gila trout in Sheep Corral Creek and headwater catfish in Sitting Bull Canyon Creek on the Lincoln National Forest. We strongly urge that the Recovery Team for the Chihuahua chub include a member who is conversant in fish habitat relationships, so that habitat requirements for the species can be fully addressed before on-the-ground commitments are made.

C-2

We appreciate the opportunity to review this draft and hope that our comments will aid in developing a usable planning document. The actions prescribed in recovery plans assume a high priority in our project planning and budgeting; therefore, we prefer to see them as specific as possible.

Sincerely,

DAVID F. JOLLY
Deputy Regional Forester

United States Department of the Interior

BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

IN REPLY
REFER TO: LC-157B
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Memorandum

To: Regional Director, Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103

From: FOR Acting Regional Director

Subject: Agency Review Draft Recovery Plan for Chihuahua Chub (your September 27, 1985, office memorandum)

We have reviewed the subject document as requested by your memorandum dated September 27, 1985. Our comments are enclosed.

Should you require any clarification or further information regarding these comments please contact Tom Burke of our Environmental Office at (702) 293-8464 or FTS-598-7464.

Roy D. Gear

Enclosure

End. Sp. R-2
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Specific Comments

1. Distribution and Status (Page 3): The discussion and map (Figure 1) raise questions relative to Bear Canyon Reservoir. Is this a mainstem reservoir or off-river reservoir? If this is an off-river reservoir, do chubs occur in the discharge stream or tail-race area? How long is the discharge stream?

D-1 Also, what is the river distance between Allie Canyon and Mimbres Post Office (miles or kilometers)? How long is the privately-owned spring creek? How long a reach of the Mimbres River was historically occupied by chubs (guess)? Regarding the distribution in Mexico, how many miles or kilometers of stream presently have chubs and what percentage is this of the historical distribution?

2. Figure 1 (Page 4): A number of additions to this figure would increase its usefulness:

D-2
i) Scale in miles or kilometers
ii) Demarcation of Allie Canyon
iii) Demarcation of private spring tributary
iv) Explanation of circled numerals
v) Demarcation of Grant County line

3. Reasons for Decline (Pages 3-6): We suggest that this section give equal treatment to physical, chemical, and biological parameters of habitat. The top of page 6 attempts to credit physical changes in the habitat for the decline of chubs, while the bottom paragraph on page 6 suggest that biological changes (introductions of exotic fishes) had a minor role. Since no single factor can be decidedly pointed to for the decline, we suggest that all of these factors together are

D-3 responsible.

This section of the report would be better understood if it was formatted to come after the discussion on biology and conservation. At a minimum, the historical habitat of the chub should be described first if loss of habitat is considered as a major cause for their decline. Logically, descriptions of both the historical and presently-utilized habitats should be presented and compared (both quantity and quality).

4. Biology (Page 7): It is inferred from discussions elsewhere in the

D-4 text (last sentence, page 2; last sentence, paragraph 1, page 7; etc.) that some life history factors or observations have been made on young chubs. If this is true, these and other life history information should be included in this section.

5. Terminology: A few words used in the text are very unusual, uncommon or misspelled. We attempted to locate two such words, syntopically (Page7) and exigencies (page 9), in either a standard dictionary or a

D-5 dictionary of scientific and technical terms. We were unsuccessful in both cases. If these words are not misspelled, we suggest a more common word or phrase be used in such cases so that the report is more readily understood by the general public.

6. Conservation (Page 9): The first paragraph suggests that the severe flooding between late 1978 and early 1979 had a very positive impact D-6 to the chubs, resulting in a three- to four-fold increase in adult fish. This contradicts statements given on page 6 regarding the effects of flooding.

D-7 7. Prime objective (Page 10): Change "and" in third line to and/or, as relict populations exist and more may be found.

8. Recovery Plan Narrative: We agree with the statement made on page 13, D-8 section 121, regarding chub habitat. It appears from the bulk of the information provided that the existing habitat in the Mimbres River is unsuitable for chub. The main question therefore, is why are chubs existing there?

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT CORPS OF ENGINEERS
P. O. BOX 1580
ALBUQUERQUE, NEW MEXICO 87103-1580

REPLY TO ATTENTION OF

December 23, 1985

Engineering and Planning Division
Planning Branch

Mr. Michael J. Spear
Regional Director, Region 2
United States Fish and Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Spear:

Thank you for the opportunity to review and comment on the Draft Recovery Plan for the Chihuahua Chub. The Corps of Engineers can, as part of its responsibilities for flood control, administration of Section 404 of the Clean Water Act, and planning assistance to other agencies, incorporate and recommend measures that can contribute to the conservation and enhancement of the Chihuahua Chub and its habitat. There are measures that can concurrently contribute to the integrity and protection of certain flood control features and benefit aquatic and riparian resources. Also, there are other simple measures that can be accomplished during any construction activities that can improve aquatic habitat.

E-1 The first item on the last page of the Implementation Schedule should be modified, since the Corps of Engineers is not authorized to provide or repair irrigation diversions. However, the Corps can provide flood protection for existing irrigation structures, if justified, and provide technical assistance in their design.

Your coordination of the Recovery Plan is appreciated, and we will continue to provide planning assistance.

Sincerely,

Jasper H. Coombes, P.E.
Chief, Engineering and Planning Division

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OFFICE OF THE
REGIONAL DIRECTOR

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IN REPLY REFER TO:
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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
Post Office and Federal Building
P.O. Box 1449
Santa Fe, New Mexico 87504-1449

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CL-10-264

OCT 24 1985

Memorandum

To: Regional Director, Region 2, FWS, Albuquerque, NM

From: Deputy State Director, Lands and Renewable Resources, BLM, Santa Fe, NM

Subject: Agency Review Draft Recovery Plan for the Chihuahua Chub

After reviewing the subject draft, we would like to provide the following comments and questions:

F-1 1. A more comprehensive description of this species habitat/location is needed. This description should at a minimum include, land ownership status and mineral estate status.

F-2 2. Has water quality been analyzed in the section of the Mimbres River identified on Figure 1?

F-3 3. Are upstream mining/mineral operations being conducted on this river drainage? Have they been conducted in past years?

Thank you for the opportunity to review this document.

David T. Jones

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United States Department of Agriculture
Soil Conservation Service
517 Gold Avenue SW, Room 3301
Albuquerque, NM
87102

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October 21, 1985

Mr. Mike Spears
Asst. Regional Director
Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

End. Sp. R-2
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Dear Mike:

SCS has reviewed the September 27, 1985, "Agency Review Draft of the Recovery Plan for the Chihuahua Chub." It is noted that the plan is based upon the 1980 management plan written by the New Mexico Department of Game and Fish.

Our principle interests are in the proposals outlined to accomplish the actual recovery, which are presented on pages 12 through 20.

G-1 On page 12, 1-11 the second paragraph states that activities including grazing, logging, cropland irrigation, the use of chemical agents must be critically reviewed to determine any negative affect on the survival or maintenance of the chub population. Since these types of activities are a normal, continuing part of agricultural enterprises in the valley and its tributary watershed, we suggest that further elaboration on how the critical review will be conducted is in order.

G-2 On page 19, 133 a rationale is presented whereby local landowners having irrigation rights will be assisted in the construction of acceptably designed permanent diversion dams. We suggest that this statement will elicit considerable local interest. The final plan should provide more explicit details as to how the legal agreements, as well as engineering and financial assistance, are to be provided to the landowners.

As originally stated in our February 1981 letter regarding the establishment of critical habitat, SCS concurs that special design considerations can be mutually developed for diversion dams or flood reclamation activities. We do feel that these special considerations will result in increased costs to the landowners.

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G-3 The final plan should clearly state what financial arrangements are to be made available to landowners who agree to modify their normal activities in the effort to benefit the chub.

Sincerely,

Ray T. Margo, Jr.
State Conservationist

cc:
Harold Olson, Director, Game & Fish Division, Villagra Building, Santa Fe, NM 87501

RESPONSES AND REPLIES

A-1 Paragraph was corrected.

A-2 Map was changed as recommended.

A-3 Paragraph was changed to include identification of agencies involved in the stream work. The second paragraph on Page 3 was changed to incorporate a description of land ownership along the river, mainly private.

A-4 Little or no recent information is available on the Mexican chub population other than general information relating to continued destruction of habitat. Mexico is not a CITIES nation, has few resources to expend on the conservation of native fish species, and has shown no interest in participating in native fish conservation efforts with the U.S., thus no effort is made in the recovery plan to include Mexico.

A-5 The "Conservation' section was changed as suggested. Habitat management responsibility rest with private landowners and the New Mexico Department of Game and Fish. A sentence was added discussing the purpose of maintaining captive stock at Dexter NFH.

A-6 Suggested change made.

A-7 Suggested change made.

A-8 Task 121 changed to include consideration of laboratory studies.

A-9 Suggested addition added to the recovery plan.

A-10 Plan changed to include the suggested subtask.

A-11 Suggested addition included.

B-1 Map changed to include Allie Canyon.

B-2 Distance scale for maps added.

B-3 The recovery plan and Fig. 3 have been changed to include the NMG&F property above San Lorenzo as a potential reintroduction site.

B-4 The estimated cost are those expected to be incurred by the USFWS Law Enforcement Division in conducting Federal investigations of illegal bait fish introductions.

C-1 The activities which are referenced on pages 12 and 13 are those which would be subject to the Section 7 consultation process. These activities would not be stopped, but if it

is determined they could affect a listed species, prudent and reasonable alternatives would be developed.

C-2 The Desert Fishes Recovery team will be responsible for advising the Fish and Wildlife Service on implementing the recovery plan. This team contains several members who are extremely knowledgeable concerning fish habitat requirements.

D-1 Bear Canyon Reservoir is an off-river reservoir as shown on Figure 1. The chub does not occur in the tail-race or the stream below Bear Canyon Reservoir. The addition of a distance scale on Figure 1 gives an approximate idea of the length of stream below Bear Canyon Dam.

D-2 Figure 1 was changed accordingly.

D-3 The recovery plan addresses all factors believed to be responsible for the decline of the chub. One of the tasks, identified in the step-down portion of the plan, is to gather information on the physical, biological, and chemical parameters of the habitat (Task 121). As suggested the Reasons for Decline section was moved to the end of Part I. Very little information exist on the historically occupied habitat, therefore, comparisons are not possible.

D-4 All the information of life history, gained from culturing the species at Dexter NFH, is included in the recovery plan.

D-5 The text was changed as suggested.

D-6 The severe flooding referred to had a negative impact on the chubs because of the channelization of the river which followed the flooding. The population estimation includes the fish found in the springfed tributary opposite Bear Canyon Reservoir. The numbers referred to as being negatively affected by flooding only considered the fish in the river.

D-7 Changed as suggested.

D-8 The bulk of the population does not exist in the Mimbres River, but is found in a small, springfed tributary as described on page 3 of the recovery plan. It is suspected that this is the source of fish which are found in the river.

E-1 Changed as suggested.

F-1 A sentence was added to the second paragraph on page 3.

F-2 Yes, the USGS operates a gauge 08477110 at the town of Mimbres and has collected water quality information and flow information.

F-3 To the best of our knowledge, no upstream mining/mineral operations are being conducted or have been conducted.

G-1 The paragraph was changed to include mention of the Section 7 consultation process.

G-2 Sentence added to the first paragraph of Task 133.

G-3 The financial arrangements which can be made available to local landowners cannot be determined at this time.