



CUI-UI
Recovery Plan

CUI-UI RECOVERY PLAN
-REVISION-

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THIS IS THE COMPLETED REVISED CUI-UI 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 INDIVIDUALS WHO PLAYED THE KEY ROLE IN PREPARING THIS 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 EXPENDED CONTINGENT UPON APROPRIATIONS, PRIORITIES, AND OTHER BUDGETARY CONSTRAINTS.

Acknowledgements should read as follows:

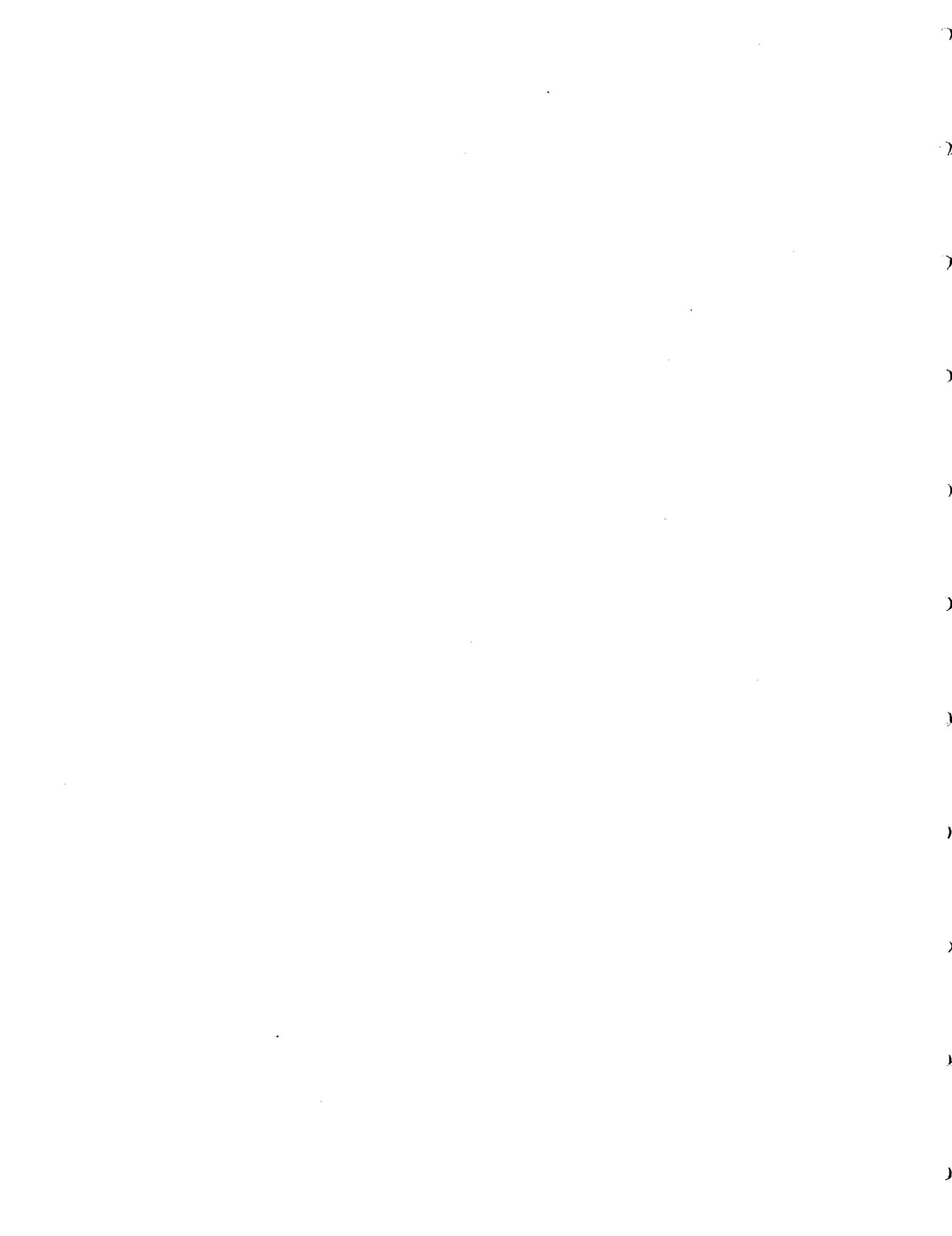
The revised Cui-ui Recovery Plan, dated November 22, 1983, prepared by the U.S. Fish and Wildlife Service, Portland, Oregon.

Additional copies may be obtained from:

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PART I. INTRODUCTION

The cui-ui recovery plan was approved on January 23, 1978 and provided direction to the recovery effort through FY 1980. The goal of the plan is to restore the species to a non-endangered status and to reclassify it from endangered to threatened. The strategy is to protect existing cui-ui, to augment the population by artificial culture, and to protect and restore essential habitat. The main thrust of the recovery effort is to acquire information about the reproductive requirements of cui-ui so that action can be taken to re-establish a viable population.

An updated plan was prepared in 1980 to direct the recovery effort through FY 1983. The plan's goal did not change. It updated the direction of the recovery effort to reflect knowledge acquired since the plan was approved. Actions of the plan that had been completed or considered low priority were deleted. Critical phases of the updated recovery effort through FY 1983 were: 1) continuation of the propagation effort including development of techniques to produce cui-ui beyond the larval stage; and 2) establishment of spawning runs and recruitment success in the Truckee River. Accomplishment of phase 2 required: 1) studies to determine spawning habitat requirements and life history; and 2) operation and evaluation of the Pyramid Lake Fishway.

This document is a second update of the Cui-ui Recovery Plan. It provides direction to the recovery effort through FY 1986. The plan's goal has not changed. The main recovery effort will continue to identify and rehabilitate cui-ui habitat, and manage the cui-ui population to the best of our knowledge. Details of this effort are provided in the Stepdown Outline and Narrative of Part II of this document. Informational requirements listed in the approved recovery plan and the 1980 update that have been acquired or found nonessential are not addressed in this update. An Implementation Schedule of priorities, responsibilities, and estimated costs is also presented.

PART II. RECOVERY

Goal

The goal of the Cui-ui Recovery Plan is to restore the cui-ui, Chasmistes cujus (Cope), to non-endangered status, making it possible to downlist it from Endangered to Threatened. Achievement of this goal may provide sufficient species security within historical habitat to consider delisting. Meeting the goal of non-endangered status will be accomplished by restoring and maintaining an optimum size, self-sustaining population of cui-ui in Pyramid Lake. This task is divided into three components: 1) identification, rehabilitation, and maintenance (security implied) of sufficient habitat for cui-ui in the Truckee River and Pyramid Lake to maintain the optimum cui-ui population through natural reproduction; 2) protection and management of the optimum population of self-sustaining cui-ui; and 3) education of the public about the cui-ui recovery effort. Monitoring the progress of components 1 and 2 will provide the basis for establishing quantified objectives for the complete recovery of the species.

Narrative

The goal of the recovery effort will be achieved through proper management of the species and rehabilitation of the species' historic habitat. If the actions presented in this plan are accomplished, it is the opinion of the U.S. Fish and Wildlife Service that the cui-ui will no longer be threatened with extinction and can be reclassified from endangered status to threatened status.

PRIME OBJECTIVE: Restore and maintain an optimum self-sustaining population of cui-ui in the Truckee River/Pyramid Lake system.

Man since the turn of the 19th century has upset this system by diverting water from the river. If it were possible to return the Truckee River/Pyramid Lake ecosystem to that balanced condition, the perpetuation of the cui-ui would be assured. A self-sustaining population at an optimum level can be re-established and maintained in the river/lake system by rehabilitating essential habitat, protecting and managing the cui-ui population, and informing the public of the restoration effort.

1. Determine the biology of cui-ui.

Substantial knowledge of the cui-ui's biology has been gained in recent years. Adequate information for the recovery effort has been obtained relative to spawning migration of adults, spawning behavior, larvae emergence and out-migration, age and growth of adults, age of sexual maturity, and length-weight relationships of spawners. Additional information is needed on fecundity variations, population dynamics, food preference, and pre-spawning aggregate dynamics.

11. Life history.

Much of the cui-ui's life history is already known. That which remains to be determined relates to causes of yearly variations in fecundity levels; biological factors influencing longevity and growth; length of sexual

maturity; food preference of juveniles; and biological factors affecting the dynamics of the pre-spawning aggregate.

12. Population dynamics.

Little is known of the population dynamics of cui-ui. Estimates are required for mortality, longevity, recruitment, and age composition of the population. These estimates must be determined to assess the condition of the cui-ui population. Recent aging studies indicate that no significant recruitment has occurred since 1969. If this is true, then the cui-ui are in more danger of extinction than originally thought. Population dynamics data are needed to verify this indication.

2. Determine habitat requirements of cui-ui.

Before recovery actions can be performed we must know the habitat required by cui-ui. These requirements will be the criteria for evaluating existing habitat and establishing targets for rehabilitation activities. Insight into these requirements has been gained in recent years, but many informational gaps remain.

Recent studies have revealed some of the physical habitat characteristics required for spawning; environmental stimuli required for spawning migration initiation, and the tolerance of cui-ui egg and larvae under laboratory conditions for constant water temperatures. Information must be gathered about the influence which each environmental stimulus, or combination of, has on spawning migration. Additional information is needed about the spawning requirements, egg and larvae required environmental conditions, and the lake habitat required by all life stages of cui-ui.

21. Environmental stimuli which influence adult migration.

Analyses of preliminary migratory stimuli data indicate that Truckee River inflow to Pyramid Lake during the spring may influence

the magnitude and timing of cui-ui spawning runs. There is also the likelihood that spawning during the previous year may act as a depressant the following year. Additional information about the influence of each stimulus, or combination of stimuli, on the spawning run is required. This information will permit better management of the run, and more effective use of Stampede Reservoir water.

22. Habitat required for spawning.

Knowledge of the amount and type of cover, preferred substrate, and space required for redds is adequate. Knowledge of preferred water temperature, preferred depth and velocity for spawning is inadequate to guide recovery.

23. River water quality required by adult cui-ui.

Nothing is known about the river water quality required by adult cui-ui. This information is essential for cui-ui habitat identification and rehabilitation.

24. Water chemistry required for egg incubation.

Required dissolved oxygen (DO) concentrations and pH levels are not known for cui-ui egg incubation. Laboratory experiments have revealed tolerance of cui-ui eggs to constant water temperatures. Information about the tolerance of cui-ui eggs to diurnal fluctuations in water temperature and identification of required DO and pH levels are necessary to rehabilitate cui-ui habitat.

25. Water chemistry and physical habitat required by larvae.

Laboratory studies have indicated the tolerance of cui-ui larvae to constant water temperatures. Their reaction to diurnal fluctuations need to be identified so the optimum flow regime for water management can be identified. Information about preferred depth and velocity and water chemistry

required by cui-ui larvae is inadequate for the recovery effort. Nothing is known of larval tolerance to suspended and deposited material and to supersaturated water that may be present below Marble Bluff Dam.

26. Lake habitat required by juveniles and adults.

Less is known about the lake habitat requirements of the cui-ui than is known about the river habitat. Insufficient information for recovery is available about the water chemistry and physical habitat requirements of all life stages of cui-ui in Pyramid Lake.

3. Rehabilitate Truckee River and Pyramid Lake habitat.

Water diversions from the Truckee River for agricultural, municipal, and industrial uses have altered the river's natural flow and reduced the amount flowing into Pyramid Lake. Inadequately treated sewage effluent and nonpoint source pollution enter the river from municipal, agricultural, and industrial sources. This has created excessive nutrient loading and toxic conditions in the river and possibly the lake. These detrimental conditions have intensified with the growth of Reno and Sparks in recent years. Channelization, grazing, and timber harvesting in and along the lower river has reduced the riparian canopy and increased bank erosion. These water quantity/quality problems have deteriorated or eliminated cui-ui spawning and nursery areas by permitting elevated water temperatures, increased sedimentation, reduced wetted perimeter, and lowered dissolved oxygen. Sufficient flows are not always available to attract cui-ui spawners to the river delta and Pyramid Lake Fishway, and to stimulate migration. The biological productivity of the Pyramid Lake ecosystem may decrease if the lake level continues to decline and nutrient levels increase.

31. Determine factors limiting the production potential of the Truckee River/Pyramid Lake ecosystem.

The effect of some limiting factors is known, while the effect of others on the river/lake ecosystem are not thoroughly understood.

311. Effect of total dissolved solids on longevity, growth, reproduction, and behavior of cui-ui.

Increasing total dissolved solids (TDS) levels may affect the Pyramid Lake food chain by reducing the survival of zoo- and phytoplankton. Recent studies have revealed the short-term tolerance of cui-ui in terms of survival to different TDS concentrations. However, the effect of TDS on longevity, growth, reproduction, and behavior of the cui-ui is relatively unknown.

312. Effect of nitrogen and phosphorous on the lake ecosystem.

A study is required to determine the effects of different nutrient concentrations (nitrogen and phosphorous) on the lake ecosystem. The lake is thought to be nitrogen deficient and phosphorous rich. Large nitrogen loading may alter the nitrogen-phosphorous ratio resulting in biostimulation and disruption of the lake ecosystem.

313. Effect of nitrogen and phosphorous on river ecosystem.

Intergavel studies indicate that nutrients may be decreasing intergravel water quality in the river by increasing biostimulation, which reduces the dissolved oxygen concentration. This may reduce or eliminate cui-ui spawning habitat. A study is needed to determine it does occur and, if so, how much cui-ui spawning habitat is degraded.

314. Effect of physical, hydraulic, and temperature characteristics of the lower Truckee River.

The relation of flow and temperature characteristics of the lower Truckee River to available habitat are not fully known. The depth and velocity characteristics of the lower river must be measured and related to required habitat. The Bureau of Reclamation has developed a model for predicting water temperatures associated with different flows during different months of the year. This model is not sufficiently accurate for determining the river flow regime required or recovery.

315. Effect of native and exotic aquatic animals.

Competition from native and exotic animals for the same space and food of cui-ui may hinder their recovery. The extent and mechanism of this competition is unknown.

316. Effect of channelization in the lower Truckee River.

The lower river has been channelized to minimize the potential of flooding. This action has effected the river's hydraulics by increasing flow velocities, which in turn increased erosion and the river's silt load. The exact impact this has had on cui-ui habitat is not fully known.

32. Determine what must be done to rehabilitate and maintain the river/lake habitat required by cui-ui (stepdown list of known problem areas).

All actions that are needed to rehabilitate cui-ui habitat have not been identified. Listed below are causes that are known to degradate cui-ui habitat at this time, but for which remedies are not known. Once a remedy is identified, it will be listed under task #33 for implementation.

321. How to stabilize the lower Truckee River in a natural course.

The lower Truckee River course needs to be re-established in a natural course in order to reduce bank erosion and decrease the river's velocity. The best way to stabilize the river in this course needs to be determined. Once identified, it will be implemented under task #33.

322. Ways to reduce water pollution.

Actions for improving water quality need to be established. This includes ways to reduce water pollution and to reduce sediments in the lower river. Many water pollution abatement techniques or

procedures have been identified, but none have been evaluated or successfully put into operation; for example, land application of sewage effluent, increased flow in lower river, or meeting EPA water quality standards at the Reno/Sparks Sewage Treatment Facility. An approach needs to be developed for the accountable agencies to cooperatively work together in selecting and implementing techniques or actions to reduce water pollution.

323. Best ladder design and screening devices on fish movement.

Instream barriers (such as dams) block or impede passage of spawners upstream, while unscreened water diversions reduce recruitment of juveniles to the Pyramid Lake population and the return of adults to the lake. Screening and ladder designs need to be researched and possibly tested in situ. Previous surveys of structures needing ladders or screens should be up-dated. Once these tasks are accomplished, the appropriate screens and ladders should be installed under task #33.

324. How to restore the river canopy.

Much of the river canopy below Reno Has been removed. This increases the temperature of the river, which is detrimental to egg and larvae survival. Techniques for restoring the river canopy must be developed so they can be implemented under task 33.

325. Develop a habitat rehabilitation plan.

A habitat rehabilitation plan needs to be developed to direct the rehabilitation of essential cui-ui habitat. The plan will include those remedies that are known at this time to be necessary, and will be updated as more remedies are identified. Therefore, the plan will be dynamic; changing as more knowledge is acquired. The plan, once developed, will be implemented under task #33.

33. Perform actions to rehabilitate and maintain essential river/lake habitat.

The habitat rehabilitation plan developed under task 324 for directing the rehabilitation of essential cui-ui habitat will be implemented under this task. All rehabilitation actions that will be required by this plan are not known at this time. Those that are known are listed below as individual rehabilitation tasks.

331. Control illegal dredge and fill in the lower Truckee River.

Illegal dredge and fill activities frequently occur in the lower river. This activity can be partly controlled by enforcing Section 404 of the Clean Water Act.

332. Enforce water pollution regulations and standards.

The Nevada Department of Environmental Protection and the U.S. Environmental Protection Agency should continue to refine and enforce water quality standards to protect cui-ui habitat.

333. Secure and maintain the flow regime identified in task #42.

Optimum flows for spawning and larvae habitat are essential to establish and maintain a self-sustaining population. Water diversions for agricultural, municipal, and industrial use have reduced the volume and timing of natural flows in the lower Truckee River so much that the optimum flow regime required for cui-ui reproduction may not be obtainable. The effectiveness of unregulated flows that remain in the lower river can be improved if augmented by releases from Stampede Reservoir. Such releases will require that the Federal Water Master receive technical advice on the amount and timing.

The volume and timing of flows in the lower river may be improved

through a negotiated settlement of the Truckee/Carson River water use conflicts. These negotiations should continue to seek additional water for cui-ui reproduction.

4. Identify and manage a self-sustaining population of cui-ui.

Implementation of this task is earnestly needed to prevent possible extinction of the cui-ui. The cui-ui have had no significant reproduction since 1969; with the possible exception of 1982 and 1983 when 14,000 and 6,000 cui-ui, respectively, ascended the Marble Bluff Fish Facility (It is not known whether these numbers of spawners are adequate to maintain the species). This is evident by the predominance of one age class (14 years old) in the spawning population. The lack of recruitment to the population is probably due to inadequate access to spawning areas. This condition is threatening the existence of cui-ui.

Restoration of the cui-ui population will require the identification and management of the optimum population with sufficient habitat to maintain a self-sustaining population. A resource management plan will disclose strategies for restoring and maintaining this population. The Marble Bluff Fish Facility must also be modified to provide access for cui-ui to spawning areas.

41. Determine the optimum self-sustaining population.

The optimum size of a self-sustaining population must be determined. Such determination will require integration of information about the cui-ui's life history, the dynamics of their population, and the carrying capacity of their habitat.

42. Determine the river flow regime required to maintain habitat for optimum self-sustaining population.

A flow regime through the lower Truckee River is required to maintain cui-ui habitat in the river and in Pyramid Lake. Preliminary analyses

recently provided an interim estimate of the flow regime required to maintain river habitat for cui-ui. This estimate is only speculative, since it was based upon an incomplete data base. An accurate determination of this flow regime is essential to rehabilitate and maintain cui-ui habitat. Life history information, riverine habitat requirements, population dynamics, and hydraulic data will be integrated to determine the flow regime needed to maintain adequate habitat for the optimum self-sustaining cui-ui population.

The annual inflow necessary for maintaining Pyramid Lake at a given level is yet to be agreed upon. Inflow needed to rehabilitate the lake habitat is not known. Determination of the amount of lake habitat required for the optimum cui-ui population will require integrating biological information with the physical and chemical limiting factors of the lake environment.

43. Develop a resource management plan for restoring and maintaining the cui-ui population

Restoration of a self-sustaining cui-ui population is not only dependent on habitat rehabilitation, but also on management guidance to achieve defined population goals. A resource management plan needs to be developed and implemented (task #44).

431. Determine population management strategy for maintaining optimum self-sustaining population.

Once the optimum population is determined, management strategies must be developed that will allow the best chance of achieving and maintaining this population.

432. Write cui-ui management plan.

Once this plan is written, it will be implemented under task #44.

44. Manage cui-ui population

Implement cui-ui management plan developed in task #43.

441. Annually monitor abundance, age composition, spawning run, and spawning success.

The cui-ui population must be monitored in order to evaluate success in maintaining the population and determine progress toward restoration of a self-sustaining population. This will involve enumeration of the spawning run and an appraisal of spawning success. Collection of these data will provide information about the size and age composition of the population.

442. Improve and operate Marble Bluff Fish Facility and Numana Dam Fishway.

The reduction of flows in the lower Truckee River since 1905 has created a delta across the mouth of the river in Pyramid Lake. This prevents cui-ui from reaching their historic spawning grounds, except during rare high water years. This is the main reason the cui-ui are now listed as endangered. An attempt was made in 1975 to remedy this barrier by building Marble Bluff Dam and Fish Facility that would provide passage around the delta. Since the fishway has never functioned properly and the dam has eliminated access to spawning areas during high water years, the cui-ui are now faced with no significant recruitment since 1969; the last high water year before this dam was built. The operational procedures and equipment of these facilities must be improved to provide effective river access and egress for larvae and adults. This will require: construction of permanent weirs in Pyramid Lake Fishway; design, construction, and evaluation of a modified building by-pass ladder; refinement of cui-ui handling procedures; evaluation of Numana Dam Fishway; and improvement of the Marble Bluff Dam River Trap. The facilities also require increased O & M and cyclical maintenance funding.

45. Augment cui-ui population with hatchery reared cui-ui until natural reproduction can sustain the population.

Until the cui-ui population can become self-sustaining it must be augmented with hatchery rearing. This is a contingency restoration measure as well as a potentially viable means of increasing the population.

451. Assess survival of hatchery reared cui-ui in Pyramid Lake.

The contribution of hatchery fish to the natural cui-ui population has not been determined. An assessment technique has yet to be determined that is suitable for these fish because they are only 10-13 mm when released.

452. Develop culture techniques to rear cui-ui larvae up to 20 mm.

It is logical to assume that larger fish will have a much greater survival than fish that are released at a smaller size. Therefore their contribution to the population will probably be greater, even though fewer can be reared to this larger size, than at the smaller size.

453. Operate hatchery facilities to produce 10 million larvae annually.

Even though the success and contribution of the hatchery releases have not been determined (task #451), they should be continued because of the likelihood that they are assisting recovery efforts. The Pyramid Lake Paiute Tribe has developed a competent staff of cui-ui fish culturalists for their cui-ui hatchery. Effort must be made to assist the Tribe in maintaining this expertise and to improve culturing techniques. Cui-ui eggs for hatchery incubation will be obtained from wild fish in Pyramid Lake.

454. Release hatchery fish at pre-selected sites.

Annually release the 10 million larvae produced in the Pyramid Lake Paiute Tribe's hatchery mentioned under task #453.

5. Protect cui-ui populations.

Proper management of the cui-ui population requires protecting the species from harassment and potential harm by humans.

51. Provide interagency cooperation to protect cui-ui.

A cooperative effort by Federal, State and Tribal Agencies is required to adequately protect cui-ui. Federal agencies are mandated to undertake programs to conserve endangered species by provisions of the Endangered Species Act.

52. Enforce Federal, State, and Tribal regulations.

Through a cooperative effort, Federal, State, and Tribal regulations must be thoroughly enforced. This will include enforcement of the Endangered Species Act, Nevada Statutes, and Pyramid Lake Tribal fishing regulations.

6. Inform the public of the Cui-ui Recovery Plan and implementation efforts.

A program of public information about the plight of the cui-ui and the consolidated recovery effort will assist the recovery of the species.

61. Provide news media with current information on progress of cui-ui restoration program.

News releases to state and local news media should be made to promote public awareness of recovery objectives.

62. Develop supplemental information leaflet.

A supplemental informative leaflet about the plight of the cui-ui, the recovery effort, and their life history should be prepared. This will entail gathering and abstracting historical information, including photographs, interviews, and published data.

PART III. IMPLEMENTATION SCHEDULE

The following table is a summary of scheduled actions and costs for the cui-ui recovery program. It is intended as a guide to meet the objectives of the plan, as elaborated in Part II, Narrative. This table indicates the priority in scheduling tasks to meet the objectives, the agencies responsible for performing these tasks, a timetable for accomplishing each task, and the estimated cost of each. Implementing Part III is the action of the recovery plan that, when accomplished, will satisfy the prime objective. Initiation of these actions is subject to availability of funds, priorities, and other budgetary constraints.

Implementation Schedule

General Categories

Information Gathering - I or R (research)

01. Population status
02. Habitat status
03. Habitat requirements
04. Management techniques
05. Taxonomic studies
06. Demographic studies
07. Propagation
08. Migration
09. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. Other information

Acquisition - A

01. Lease
02. Easement
03. Management agreement
04. Exchange
05. Withdrawal
06. Fee title
07. Other

Other - O

01. Information and education
02. Law enforcement
03. Regulations
04. Administration

Management - M

01. Propagation
02. Reintroduction
03. Habitat maintenance and manipulation
04. Predator and competitor control
05. Depredation control
06. Disease control
07. Other management

Task Priority

Priority 1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly.

Priority 2 - An action that must be taken to prevent a significant decline in species population/habitat quality, or some other significant negative impact short of extinction.

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

Agency Abbreviations

- FWS - U.S. Fish and Wildlife Service
- SE - Endangered Species
- ES - Ecological Services
- FR - Fishery Resource
- EN - Engineering
- LE - Law Enforcement

BIA - U.S. Bureau of Indian Affairs
BR - U.S. Bureau of Reclamation
USGS - U.S. Geological Survey
EPA - Environmental Protection Agency
NDOW - Nevada Department of Wildlife
PLITE - Pyramid Lake Indian Tribal Enterprises
NDEP - Nevada Dept. of Environmental Protection
COE - U.S. Corps of Engineers

Task Duration

Ongoing - task currently being implemented; to remain active for an extended period of time.

Continuous - task not now being implemented, but scheduled to be active for extended period of time once initiated.

Schedule of Priorities, Responsibilities, and Costs

General Category	Plan Task	Task #	Priority #	Task Duration	Responsible Agency			Fiscal Year Costs (EST.) X \$1000			Comments - Notes
					FWS		Other	FY84	FY85	FY86	
					Region	Program					
R-01	Life history	11	3	3	1 8	SE Research		- -	30 30	15 15	Relates to age, growth, food, and inter/intraspecific competition
R-01	Population dynamics	12	1	3	1 8	SE Research		- -	75 100	75 100	Preliminary age data indicates that cul-ui spawning is predominantly of one age class (1969). Population dynamic data are essential to confirm. If indications are correct, cul-ui may be reproductively extinct before turn of the century.
R-03	Stimuli for adult migration	21	2	2	1	SE		25	25		Refine river flow requirements started in FY81 by Region 8, Research. SE FY84 funding associated with determination of river flow stimuli of spawning run.
R-03	Spawning requirements	22	2	2	1	SE		21.5	21.5		Refine probability-of-use curves - started in FY81 by Region 8, Research.
R-03	River quality preferred by adults	23	2	-				-	-		Undetermined at this time.
R-03	Egg incubation	24	2	2	1	SE		21.5	21.5		Refine tolerance determination.
R-03	Larvae requirements	25	2	2	1	SE		21.5	21.5		Refine tolerance determination. SE FY84 funding for tasks 22, 24, and 25 associated with determination of environmental factors in river affecting cul-ui survival.

Schedule of Priorities, Responsibilities, and Costs (con't.)

General Category	Plan Task	Task #	Priority #	Task Duration	Responsible Agency			Fiscal Year Costs (EST.) X \$1000			Comments - Notes
					FWS		Other	FY84	FY85	FY86	
					Region	Program					
R-03	Juvenile/adult Lake Requirements	26	2	3	8	Research		-	150	150	
R-12	Effect of TDS on cui-ui	311	2	3			EPA BIA	- -	100 100	100 100	
R-12	Effect of N and P on lake ecosystem	312	2	3			EPA BIA	- -	100 100	100 100	
R-12	Effect of N and P on river ecosystem	313	2	3			NDEP EPA NDOW	- - -	75 100 25	75 100 25	
R-02	River hydraulics and temperature prediction model	314	2	2	1	SE	BR USGS	- - -	50 30 150	50 10 40	FWS would conduct a depth and velocity study, while BR and USGS would refine the temperature prediction model.
R-10	Native/exotic animal impact	315	3	2	1 8	SE Research		- -	15 30	15 30	
R-02	Impact of channelization	316	2	3	1	SE	BIA BR USGS	- - -	20 10 50 10	10 20 10	SE to determine impact on cui-ui spawning habitat. Other agencies to determine impact on streambed, hydraulics, and water temperature.
M-03	Determine how to stabilize river	321	2	-			BR BIA COE	- - -	- - -	- - -	To be determined - depends upon outcome of task 316. Water Eng. & Tech., Inc. estimate cost at \$98,000.
M-03	Ways to reduce water pollution	322	2	ongoing	1 1	ES SE	EPA NDEP BIA	10 10 10 10	- - - -	- - - -	FY85 and FY86 funding to be determined - depends upon approach identified in FY84. SE: FY84/85 PA obj. 5e (Att. 6) ES: Included in FY84/85 PA obj.

General Category	Plan Task	Task #	Priority #	Task Duration	Responsible Agency			Fiscal Year Costs (EST.) X \$1000			Comments - Notes
					FWS		Other	FY84	FY85	FY86	
					Region	Program					
M-07	Ladder/screen design	323	2	-	1 1	SE EN	NDOW BR	- - - -	10 - 5 5	- - - -	Identified cost is for survey of ladder and screen need. Design costs, which are related to need, remain to be determined. EN and BR will bear the cost of design.
M-03	Habitat rehabilitation plan	324	3	-	1	SE		-	-	40	These funds are for developing habitat rehabilitation plan. This does not include cost for implementation. Development of plan depends upon completion of tasks 31, 321, 322, and 323.
M-03	Restore river canopy	325	2	-			PLITE BIA	- -	- -	- -	To be determined.
M-03	Illegal dredge and fill	331	2	Ongoing	1	ES	COE	5 10	5 10	5 10	ES: Included in FY84/85 PA obj.
M-03	Water pollution regulations	332	2	Ongoing	1	ES	NDEP EPA	5 5 5	5 5 5	5 5 5	ES: Included in FY84/85 PA obj.
M-03	Secure/maintain flow regime	333	1	Ongoing	1	SE	BR BIA	5 - -	5 - -	5 - -	Without proper management of Stampede Reservoir water the cut-off stands a greater chance of extinction than with management because there will be less habitat for reproduction. FWS funding for technical assistance to BR in managing Stampede Reservoir for fishery releases. BR and BIA costs are unknown because linked to water-use conflict negotiations which are in progress. SE funding associated with re-establishing cut-off spawning run. SE: FY84/85 PA obj. Se (Att. 6).

Schedule of Priorities, Responsibilities, and Costs (con't.)

General Category	Plan Task	Task #	Priority #	Task Duration	Responsible Agency			Fiscal Year Costs (EST.) X \$1000			Comments - Notes
					FWS		Other	FY84	FY85	FY86	
					Region	Program					
R-01	Determine optimum population	41	2	-	1 8	SE Research		- -	- -	- -	To be determined - cost and duration depends upon completion of tasks 11. and 12.
R-03	Determine flow regime	42	2	3	1	SE	BR	5 25	5 10	5 10	Completion depends upon information from tasks 1., 2., 314., and 41. SE funding associated with re-establishment of spawning run.
M-07	Cui-uf mgt. plan	43	2	3	1	SE		-	5	25	
M-07	Manage run	441	2	ongoing	1	SE		15	20	20	SE funding for monitoring run and re-establishing run. Increase in funding to cover additional expenses of more effective fish handling and monitoring. SE: FY84/85 PA obj. 5e (Att. 6).
M-07	Improve and operate MBFF and Numana fish ladder	442	1	ongoing	1 1 1	SE FR EN	BR	25 80 30 -	25 80 -	25 80 -	SE funding for evaluating ladders, while FR funding for O&M of facilities and EN funding for developing Facility Development Plan. The cost of cyclical maintenance and facility improvements will not be known until the plan is completed. BR cost will be for certain improvements. MBFF is the cui-uf's only access to spawning habitat without which they may become extinct. SE: FY84/85 PA obj. 5e (Att.6). FR & EN included in FY84/85 PA obj.
M-01	Hatchery cui-uf survival	451	3	3			PLITE	-	-	-	Cost cannot be estimated until evaluation technique is determined.
M-01	Rear cui-uf to 20 mm	452	3	2			PLITE	16	16	-	

Schedule of Priorities, Responsibilities, and Costs (con't.)

General Category	Plan Task	Task #	Priority #	Task Duration	Responsible Agency			Fiscal Year Costs (EST.) X \$1000			Comments - Notes
					FWS		Other	FY84	FY85	FY86	
					Region	Program					
M-01	Operate cui-ui hatchery	453	2	ongoing	1	SE	PLITE	140 5	140 5	140 5	SE funding to provide technical assistance to PLITE. SE: Included in FY84/85 PA obj. 5e (Att. 6).
M-01	Release hatchery cui-ui	454	2	ongoing			PLITE	10	10	10	
0-02	Protect cui-ui	5	1	ongoing	1	LE	NDOW PLITE	7 8 17	7 8 17	7 8 17	Cui-ui spawning must be protected so they are allowed to reproduce, otherwise the population will decline because of no recruitment. Also a requirement of the Endangered Species Act. LE: Included in FY84/85 PA obj.
0-01	News media	61	3	ongoing	1	SE	PLITE NDOW	2 1 1	2 1 1	2 1 1	
0-01	Information leaflet	62	3	1			PLITE	4			SE: Included in FY84/85 PA obj. 5e (Att. 6).

