

EXECUTIVE SUMMARY

The Colorado River Fishery Report consists of a Summary Report (Part 1) which synthesizes and analyzes Field Investigations (Part 2) and hatchery/laboratory Contracted Studies (Part 3). Those interested in methodology and details of each study should review Parts 2 and 3.

Findings

Colorado squawfish are widespread throughout the Upper Colorado River Basin and do not appear to be concentrated in large numbers in any one location. Numbers of Colorado squawfish appear to be less today than 10 to 20 years ago and may still be declining. Archer (1982) has calculated a 66 percent decline in juvenile and adult Colorado squawfish from 1960 to 1980. The decline in young-of-the-year is even greater with a projected decline of 94 percent between 1960 and 1980. Spawning areas seem to be limited and the life stages of greatest concern are those from spawning through the first year. If adequate spawning and rearing areas cannot be found, protected, and managed, then a species management program with stocking would be required to ensure the continued existence of the Colorado squawfish. Extensive movement of Colorado squawfish was documented with total movement of some individuals over 200 miles. Spawning, migration, and homing behavior was observed and one definite Colorado squawfish spawning site was confirmed in the Yampa River. Movement of Colorado squawfish between mainstem rivers and tributary streams was documented. Blockage of migration routes may be a significant factor in the decline of the species.

Humpback chubs are not wide ranging and are found primarily in four locations (Black Rocks, Westwater Canyon, and Gray Canyon in the Upper Colorado River Basin and the Little Colorado River in the Lower Colorado River Basin). Habitats differ slightly from area to area; however, the chubs appear stable in three of the four locations. Only the Gray Canyon population seems unstable and possibly decreasing at this time. Given the deep and narrow canyon configuration of the Colorado River at Black Rocks and Westwater Canyon, it does not appear that present flow depletions and regulations are limiting factors to the chub in the Upper Colorado River. However, some hybridization with roundtail chub has been documented which may be related to changes in flow and/or temperature. The humpback chubs are very sensitive to temperature and demonstrated a need for temperatures of at least 16-18° C in the spring to successfully spawn and have eggs hatch. Barring significant changes in their habitat humpback chubs should be considered relatively secure at their present population level at Black Rocks and Westwater Canyon in the Upper Basin and in the Little Colorado River in the Lower Basin. The Gray Canyon population, found in the Green River, seems to be decreasing rapidly and will require management programs in the near future if this population is to be maintained.

Few, if any, bonytail chubs still exist in the Upper Basin. A few individual bonytail were found in the Green River in Gray Canyon.

The largest existing population of bonytail chub is found in Lake Mohave in the Lower Basin. The bonytail chub have been artificially propagated in the hatchery where they have produced offspring. At this date it appears doubtful that the bonytail chub will survive without intensive species management.

Razorback suckers, like the bonytail, are rare in the Upper Basin. However, a few razorbacks were observed at spawning time near the Ashley Creek confluence on the Green River, the Walker Wildlife Area, and a gravel pit on the Colorado River near Clifton, Colorado. Reproduction seems to be a major problem and no young razorback have been recorded from the Upper Colorado River in recent years. Almost all fish observed in this study were old individuals. Competition with exotics appears to be a serious problem for the razorback, although only limited data collected during this study and observations recorded in Lower Basin work supports that conclusion. Again, the survival of razorbacks will probably require some intensive species management.

Recommendations

Any program developed to protect the rare Colorado River endemic fishes should focus on three concerns. First, the protection of existing spawning and rearing areas; second, the continued development of habitat improvement areas with associated facilities to ensure propagation and management of the species, in case natural production fails; and third, protection and maintenance of migration routes for Colorado squawfish to ensure access to spawning, feeding, and rearing areas.

A Colorado River endangered fish monitoring program which would evaluate recommended river flow requirements and the use of specific natural and man-made areas by endemic fishes is required. These studies should be reduced in scope to verify flow needs and assess existing reproductive success on known spawning areas. Further, the studies would help arrive at some practical solutions for the propagation of rare fishes which may need intensive management. Potential problems relating to hybridization of chubs may also require monitoring.

Minimum instantaneous flow requirements at selected sites for the Colorado squawfish and humpback chub are presented in the table on the following page. These minimums are based upon computer simulation, physical habitat modeling, and actual flow for 1979-81. The flow of the river at these selected points should not fall below the required level to ensure the present levels of reproductive success. However, it should be noted that the Colorado squawfish populations in many areas are decreasing under present conditions and additional measures will need to be implemented to stabilize or increase the numbers of this endangered species.

Any future water development program in the Colorado River system should be compatible with the known requirements of the endangered Colorado River fishes. The Fish and Wildlife Service is presently developing a conservation plan to provide guidance for future management of the endangered Colorado River fishes. We believe that eventually a management program including habitat improvement, a hatchery, and stocking will be required for some, if not all, of these endangered fishes.

Streamflow and water temperature requirements needed to maintain present production levels for Colorado squawfish^{1/} and humpback chub in the Upper Colorado River, data base to 1981

Critical areas	Fish species and life stage	Time period	Flow ^{2/} (cfs)	Temp. ^{3/} (C)
<u>Colorado River</u>				
Loma - Utah Line (RM 132-154)	Colorado squawfish spawning and larval stage	6/15-7/31	5,000-10,000	20-22
		8/1-8/31	3,000-5,000	20-28
Black Rocks (RM 135-137)	Humpback chub spawning	5/1-6/30	10,000-13,000	16-18
Westwater Canyon (RM 116-124)	Humpback chub spawning	5/1-6/30	10,000-13,000	16-18
Potash - Cataract Canyon (RM 3-47)	Colorado squawfish YOY rearing	7/15-10/15	4,000-9,000	20-28
<u>Green River</u>				
Split Mountain (RM 199-207)	Colorado squawfish spawning	6/15-7/31	3,000-4,000	20-22
		8/1-8/31	2,000-2,500	20-22
Jensen - Sand Wash (RM 212-290)	Colorado squawfish YOY rearing	7/15-10/15	2,000-4,000	20-28

^{1/} Analysis of the last 20 years of information indicates that Colorado squawfish production is declining and present production levels may be inadequate to prevent species from going to extinction.

^{2/} Flow is given as a minimum range for the period of requirements. For instance, 10,000 cfs at Loma for spawning in mid-June could normally drop to 5,000 by the end of July.

^{3/} Temperatures are expressed as optimum averages and fluctuations of 1-2° C would be considered normal.

3 COLORADO RIVER FISHERY PROJECT

PART I

(Summary Report) ✓
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