United States Department of the Interior

Fish and Wildlife Service

Aquatic Study

Special Report on Distribution and Abundance of Fishes

of the Lower Colorado River

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INTRODUCTION

To the Pima Indians it was the "Buqui Aquimuri" (Red River). The Yumas called it "Javill" or "Haweal" meaning red. In 1774 a Spanish missionary, Friar Frances Garces, translated the Yuma name as Rio Colorado, later known as Colorado River (Granger, 1960).

The fifth longest river in the United States, the Colorado River begins in the Rocky Mountains of Colorado and Wyoming, flows southwesterly for approximately 1,450 miles through Utah, Arizona, Nevada and California, finally discharging into the Gulf of California, Mexico (USBR, 1946).

The watershed of the river drains 242,000 square miles in the United States, 1/12 the area of the continental United States, and 2,000 square miles in Mexico (USBR, 1946). The Colorado River Compact of 1922 defines the division between the upper and lower basin as the Compact Point, one mile downstream of the confluence of the Paria River near Lees Ferry, Arizona. The watershed of the lower basin comprises approximately 141,000 square miles.

The lower Colorado River may be classified into two sections depending on the stream gradient. From Lees Ferry to the backwaters of Lake Mead, the gradient is intermediate, 8 feet per river mile, as the river tumbles through the high plateaus of northern Arizona via the majestic Grand Canyon.

From Hoover Dam to Imperial Dam near Yuma, Arizona the low gradient, 1.8 feet per mile, is reflected in the lower stream velocities and the more wandering nature of the channel through broad, flat valleys flanked by low north-south trending mountains of the Basin and Range Physiographic Province (Fenneman, 1931).

Before the construction of numerous dams which considerably altered the character of the Colorado, the flow had always been quite variable, usually peaking with the spring run-off in June and then diminishing by August. A period of low flows would usually extend from September through February (Dill, 1944).

For example, the all-time maximum flow for the river was estimated at 400,000 cubic feet per second (cfs) around 1862. In contrast, a minimum flow of 538 cfs was recorded above Imperial Dam on August 3, 1934. Similarly, the maximum flow for the river near Grand Canyon, Arizona was estimated at 300,000 cfs occurring on July 8, 1884. A maximum measured flow there was recorded at 127,000 cfs on July 2, 1927, while a few years earlier on December 28, 1914 the recorded minimum flow there was only 700 cfs (USGS, 1978). Flows in the Black Canyon before the construction of Hoover Dam ranged from 3,000 cfs to 150,000 cfs (Dill, 1944). Since Hoover Dam, the average discharge has been 13,270 cfs (1935-1977) (USGS, 1978).

Flow of Lees Ferry prior to the construction of Glen Canyon Dam averaged 17,850 cfs (1911-1962) and, after its completion, 12,170 cfs (1964-1977). The maximum discharge here since 1895 was 220,000 cfs on July 18, 1921, with an estimated maximum discharge for July 7, 1884 of 300,000 cfs (USGS, 1978).

More characteristic than the extreme flows was the sediment carried by the Colorado; indeed, it was the basis for the Colorado's name. The old saying, "Too thick to drink; too thin to plow," aptly applied to this river before the "Dam Era" (1935-1966).

At Lees Ferry the annual silt load was estimated at 100 million tons before the closure of Glen Canyon Dam (NPS, 1975). Lake Mead was accumulating 91,450 acre-feet (ac-ft) annually with a total accumulation of 2,716,000 ac-ft between 1935 and 1964 (USBR, 1978).

Before the advent of the dams, silt in the river at Yuma above the confluence of the Gila River was estimated at 138,000 ac-ft annually or one-half million tons daily (Dill, 1944). With the construction of the dams, the silt load was reduced considerably. For example, the annual silt load moving past Yuma in 1940 had been reduced to 2,070 ac-ft (Dill, 1944).

Upon the completion of Laguna Dam in 1909, dams, protective works, and channelization began to alter the lower Colorado River in a continuing saga. Table 1 chronologically lists the dams and resulting reservoirs on the Colorado River downstream from the Arizona-Utah border.

Protective works include such structures as levees, training structures in the channels, and riprapping of banks. Channelization includes both the deepening of the original channels and the creation of new ones.

All of these controls, employed for the purposes of flood control, water delivery, water salvage, and hydroelectric power development have had a profound effect on the riverine environment.

Dams and the concomitant ponding of large reservoirs decreased heavy turbidity and regulated the flows, thereby replacing seasonal fluctuations with moderated daily and weekly cycles (Saiki, 1976).

Low biotic diversity characterized the fluctuating, harsh environment of the pre-dammed Colorado. In the warm swift, roiling waters, submergent vegetation was lacking and invertebrates practically nonexistent. However, fish fauna such as the humpback chub, Colorado River squawfish, and razorback sucker were especially adapted to these conditions. After the dams, the water cleared, flows became constant, and the river was able to support greater biotic diversity. Submergent vegetation became

TABLE 1

DAMS ON THE LOWER COLORADO[1/]

Completion Date	Dam	Reservoir
1909	Laguna Diversion Dam	
1935	Hoover Dam (originally Boulder Dam)	Lake Mead
1938	Imperial Dam	
1938	Parker Dam	Lake Havasu
1944	Headgate Rock Dam	
1950	Morelos Dam	
1953	Davis Dam	Lake Mohave
1957	Palo Verde Diversion Dam	
1964	Glen Canyon Dam[2/]	Lake Powell
1966	Senator Wash Dam	Senator Wash Reservoir

1/ USBR, 1974

2/ Within the boundaries of the Upper Colorado River Basin

common and many exotic fish species which immigrated into the mainstem naturally and through stocking found this new environment desirable and flourished. However, many of the less adaptive native fishes became locally extinct (Saiki, 1976) and are threatened today with total extinction.

The Colorado has changed greatly since its development by man. Efforts are being made to understand the ecological impacts of this development and manage the river wisely. We hope that this report will aid in the management of this valuable resource.

FISH SYNONYMY

The following is a list of fishes known to have occurred in the mainstem of the lower Colorado River from Lees Ferry to the International Boundary. The fishes are listed phylogenetically by order and family and according to the classification used by the American Fisheries Society (Bailey et al., 1970). They are listed alphabetically by genus and species within the families. The common names(s), the currently accepted scientific name (including patronym), and a synonymy is given for each species. Sources of information on nomenclature, including a bibliography for the synonymy, are W.L. Minckley (1973; 1978 pers. comm.) and Bailey et al. (1970). The author cited after each synonym was the first to use the name in a publication on occurrence of the given species in the Colorado River Basin. It is hoped that this partial synonymy will help the reader elucidate the confusion of names encountered in the literature on fishes of the Colorado River Basin.

BONY FISHES (OSTEICHTHYES)
OF THE LOWER COLORADO RIVER

ORDER ACIPENSERIFORMES

Acipenseridae - sturgeons

1. white sturgeon
   Acipenser transmontanus Richardson
   (Acipenser transmontanus) Schimmel, 1967

ORDER ELOPIFORMES

Elopidae - tarpons

2. machete (Pacific tenpounder)
   Elops affinis Regan
   (Elops affinis) Glidden, 1941

ORDER ANGUILLIFORMES

Anguillidae - freshwater eels

3. freshwater eel
   Anguilla sp.
   (Anguilla sp.) Minckley, 1973

ORDER CLUPEIFORMES

Clupeidae - herrings

4. American shad
   Alosa sapidissira (Wilson)
   (Alosa sapidissima) Taggart, 1885

5. threadfin shad
   Dorosoma petenense (Gunther)
   (Dorosoma petenense atchafalayae) Haskell, 1959
   (Signalosa petenensis) Chance, in Minckley and Krumholz, 1960
   (Dorosoma petenense) Shapovalov, et al., 1959
   (Dorosoma petenensis) (sic) Minckley and Deacon, 1968

ORDER SALMONIFORMES

Salmonidae - trouts

6. coho salmon (silver salmon)
   Oncorhynchus kisutch (Walbaum)
   (Oncorhynchus kisutch) Minckley, 1971

7. sockeye salmon (kokanee, blueback salmon)
   Oncorhynchus nerka (Walbaum)
   (Oncorhynchus nerka) Miller and Lowe, 1964
   (Oncorhynchus nerka kennerlyi) Minckley, 1971

8. cutthroat trout
   Salmo clarki Richardson
   (Salmo clarkii pleuriticus) Dill, 1944
   (Salmo clarkii lewisii) Mulch and Gamble, 1954
   (Salmo clarkii) Miller, 1950
   (Salmo clarkii lewisi) Miller, 1961b
   (Salmo clarki henshawi) Lockard, in Minckley, 1973

9. rainbow trout
   Salmo gairdneri Richardson
   (Salmo gairdnerii) Moffett, 1942
   (Salmo gairdnerii irideus) Miller, 1950
   (Salmo gairdneri) Miller, 1952b

10. brown trout (German brown trout, Lochleven trout)
    Salmo trutta Linnaeus
    (Salmo trutta levenensis) McKee, 1930
    (Salmo trutta fario) Mulch and Gamble, 1954
    (Salmo trutta) Hemphill, 1954

11. brook trout
    Salvelinus fontinalis Mitchill
    (Salvelinus fontinalis) Miller, 1961b

ORDER CYPRINIFORMES

Characidae - characins

12. Mexican tetra (banded tetra, Mexican banded tetra)
Astyanax fasciatus mexicanus (Fillipi)
(Astyanax fasciatus mexicanus) Evans and Douglas, 1950
(Astyanax mexicanus) Bailey, et al., 1970

Cyprinidae - minnows and carps

13. longfin dace
Agosia chrysogaster Girard
(Agosia chrysogater) (sic) Girard, 1856
(Agosia metallica) Girard, 1856
(Agosia chrysogaster) Girard, 1859a
(Hyborhynchus siderius) Cope and Yarrow, 1875
(Zophendum siderium) Jordan and Gilbert, 1883

14. goldfish
Carassius auratus (Linnaeus)
(Carassius auratus) Dill, 1944

15. carp
Cyprinus carpio Linnaeus
(Cyprinus carpio) Gilbert and Scofield, 1898

16. Utah chub
Gila atraria (Girard)
(Gila atraria) Miller, 1952b

17. leatherside chub
Gila copei (Jordan and Gilbert)
(Gila copei) Miller, 1952b

18. humpback chub
Gila cypha Miller
(Gila cypha) Miller, 1946c

19. bonytail (bonytail chub)
Gila elegans Baird and Girard
(Gila emoryi) Baird and Girard, 1853b
(Gila emorii) Girard, 1856
(Gila elegans) Girard, 1856
(Gila robusta "ecotype") Rinne, 1976
(Gila robusta elegans) Miller, 1945c

20. Rio Grande chub
Gila pandora (Girard)
(*Gila nigrescens*) Miller, 1952b

21. roundtail chub (Colorado River chub, Gila trout)
Gila robusta Baird and Girard
(*Gila robusta*) Girard, 1856
(*Gila gracilis*) Girard, 1856
(*Ptychocheilus vorax*) Girard, 1856
(?) (*Gila nacrea*) Cope, 1871 (possibly young of *G. elegans*)
(*Gila seminuda*) Cope and Yarrow, 1875
(*Gila robusta seminuda*) Ellis, 1914
(*Gila robusta robusta*) Miller, 1946c

22. hitch (Sacramento hitch)
Lavinia exilicauda Baird and Girard
(*Lavinia exilicauda exilicauda*) Miller, 1952b

23. White River spinedace
Lepidomeda albivallis Miller and Hubbs
(*Lepidomeda albivallis*) Miller, 1952b

24. Virgin spinedace (Virgin River spinedace)
Lepidomeda mollispinis Miller and Hubbs
(*Lepidomeda vittata*) Tanner, 1932
(*Lepidomeda* sp.) Miller, 1952b
(*Lepidomeda mollispinis mollispinis*) Miller and Hubbs, 1960
(*Lepidomeda mollispinis*) Bradley and Deacon, 1967

25. Moapa dace
Moapa coriacea Hubbs and Miller
(*Moapa coriacea*) Minckley, 1978, pers. comm.

26. golden shiner
Notemigonus crysoleucas (Mitchill)
(*Notemigonus crysoleucas*) Miller, 1952b
(*Notemigonus crysoleucas seco*) Miller, 1952b
(*Notemigonus crysoleucas auratus*) Miller, 1952b

27. red shiner
Notropis lutrensis (Baird and Girard)
(*Notropis lutrensis lutrensis*) Miller, 1952b
(*Notropis lutrensis*) Hubbs, 1954
(*Notropis lutrensis*: *lutrensis* x *suavis*) Hubbs, 1954

28. fathead minnow
Pimephales promelas Rafinesque
(*Pimephales promelas confertus*) Shapovalov and Dill, 1950
(*Pimephales promelas*) Miller and Lowe, 1964

29. woundfin (silver dace)
Plagopterus argentissimus Cope
(*Plagopterus argentissimus*) Evermann and Rutter, 1895
(*Meda argentissima*) Jordan, 1886

30. Colorado squawfish (Colorado River squawfish, Colorado salmon, white salmon)
Ptychocheilus lucius Girard
(*Ptychocheilus lucius*) Girard, 1856

31. speckled dace
Rhinichthys osculus (Girard)
(*Argyreus osculus*) Girard, 1856
(*Argyreus notabilis*) Girard, 1856
(*Rhinichthys henshawii*, var. III) Cope, 1874
(*Ceratichthys ventricosus*) Cope, 1874
(*Apocope oscula*) Cope and Yarrow, 1875
(*Apocope couesii*) Yarrow, in Cope and Yarrow, 1875
(*Apocope ventricosa*) Cope and Yarrow, 1875
(*Apocope vulnerata*) Jordan and Gilbert, 1883
(*Agosia oscula*) Jordan, 1886
(*Rhinichthys cateractae dulcis*) Evermann and Rutter, 1895
(*Agosia couesii*) Evermann and Rutter, 1895
(*Apocope oscula oscula*) Tanner, 1932
(*Rhinichthys nubilus*) LaRivers, 1952
(*Xyrauchen texanus*)(misidentification of larva) Douglas, 1952
(*Rhinichthys osculus*) Winn and Miller, 1954

32. redside shiner
Richardsonius balteatus (Richardson)
(*Richardsonius balteatus hydrophlox*) Miller, 1952b

Catostomidae - suckers

33. Utah sucker
Catostomus ardens Jordan and Gilbert
(*Catostomus ardens*) Miller, 1952b

34. white sucker
Catostomus commersoni (Lacepede)
(*Catostomus commersoni*) Miller, 1952b

35. flannelmouth sucker
Catostomus latipinnis Baird and Girard
(*Catostomus latipinnis*) Baird and Girard, 1853b
(*Acomus latipinnis*) Girard, 1856
(*Catostomus latipinnis discobolus*) Hubbs, et al., 1942
(*Catostomus* /*Catostomus*/ *latipinnis*) Koehn and Rasmussen, 1967

36. desert sucker (Gila sucker, Gila mountain-sucker)
Catostomus clarki Baird and Girard
(*Catostomus clarkii*) Baird and Girard, 1854
(*Minomus clarkii*) Girard, 1856
(*Minomus clarki*) Girard, 1859a
(*Catostomus clarki*) Jordan, 1878
(*Pantosteus arizonae*) Gilbert, in Jordan and Evermann, 1896
(*Pantosteus clarkii*) Evermann and Rutter, 1895
(*Pantosteus clarki*) Miller and Winn, 1951
(*Notolepidomyzon arizonae*) Fowler, 1913
(*Notolepidomyzon clarki*) Snyder, 1915
(*Notolepidomyzon clarkii*) Jordan, et al., 1930
(*Notolepidomyzon utahensis*) Tanner, 1932
(*Pantosteus delphinus utahensis*) Hubbs, et al., 1942
(*Pantosteus platyrhynchus*) Wallis, 1951
(*Pantosteus* sp.) Winn and Miller, 1954
(*Pantosteus delphinus*) Sigler and Miller, 1963
(*Catostomus* [*Pantosteus*] *clarki*) Koehn and Rasmussen, 1967

37. bluehead sucker (bluehead mountain-sucker)
Catostomus discobolus Cope
(*Pantosteus jarrovii*) Cope and Yarrow, 1875
(*Catostomus discobolus*) Cope and Yarrow, 1875
(*Pantosteus delphinus*) Evermann and Rutter, 1895
(*Pantosteus delphinus delphinus*) Miller, 1952b
(*Pantosteus discobolus*) Smith, 1966

38. mountain sucker (Bonneville mountain sucker)
Catostomus platyrhynchus (Cope)
(*Catostomus platyrhynchus*) Miller, 1952b
(*Pantosteus platyrhynchus*) Minckley, 1973

39. Rio Grande sucker (Rio Grande mountain-sucker
Catostomus plebeius Baird and Girard
(*Pantosteus plebeius*) Miller, 1952b

40. dusky mountain sucker
Catostomus sp.
(*Catostomus* sp.) Miller, 1952b

41. humpback sucker (razorback sucker)
Xyrauchen texanus (Abbott)
(*Catostomus texanus*) Abbott, 1860
(*Catostomus cypho*) Lockington, 1881
(*Xyrauchen cypho*) Eigenmann and Kirsch, in Kirsch, 1889
(*Xyrauchen texanus*) Fowler, 1913

ORDER SILURIFORMES

Ictaluridae - freshwater catfishes

42. blue catfish
Ictalurus furcatus (Lesueur)
(*Ictalurus furcatus*) Essbach, in Minckley, 1973

43. white catfish
Ictalurus catus (Linnaeus)

44. black bullhead
Ictalurus melas (Rafinesque)
(*Ameiurus melas*) Dill, 1944
(*Ameiurus melas melas*) Miller and Winn, 1951
(*Ameiurus melas catulus*) Miller and Winn, 1951
(*Ictalurus melas*) Miller and Hubbs, 1960

45. yellow bullhead
Ictalurus natalis (Lesueur)
(*Ameiurus natalis*) Dill, 1944
(*Ictalurus natalis*) Koster, 1957

46. brown bullhead
Ictalurus nebulosus (Lesueur)
(*Ameiurus nebulosus*) Dill, 1944
(*Ictalurus nebulosus*) Miller and Lowe, 1964

47. channel catfish
Ictalurus punctatus (Rafinesque)
(*Ictalurus lacustris*) Mulch and Gamble, 1954
(*Ictalurus lacustris punctatus*) Dill, 1944
(*Ictalurus punctatus*) Moffett, 1942

48. flathead catfish
Pylodictis olivaris (Rafinesque)
(*Pylodictis olivaris*) Miller and Lowe, 1964
(*Pilodictis olivaris*) Minckley, 197[illegible]

Clariidae - airbreathing catfishes

49. walking catfish
Clarias batrachus (Linnaeus)
(*Clarias batrachus*) Minckley, 1971

ORDER ATHERINIFORMES

Cyprinodontidae - killifishes

50. White River killifish
Crenichthys baileyi (Gilbert)
(*Crenichthys baileyi*) Minckley, 1978, pers. comm.

51. desert pupfish
Cyprinodon macularius Baird and Girard
(*Cyprinodon macularius*) Baird and Girard, 1853b

52. California killifish (southern California killifish, California dace)
Fundulus parvipinnis Girard
(*Fundulus parvipinnis*) Miller, 1952b

53. Rio Grande killifish
Fundulus zebrinus Jordan and Gilbert
(*Fundulus zebrinus*) Shapovalov and Dill, 1950

Poeciliidae - livebearers

54. mosquitofish
Gambusia affinis (Baird and Girard)
(*Gambusia affinis affinis*) Hubbs and Miller, 1941
(*Gambusia affinis*) Moffett, 1943

55. guppy
Lebistes reticulatus Peters
(*Poecilia reticulata*) Bailey, et al., 1970
(*Lebistes reticulatus*) Minckley, 1971

56. sailfin molly
Poecilia latipinna (Lesueur)
(*Mollienesia latipinna*) Miller and Lowe, 1964
(*Poecilia latipinna*) Minckley and Deacon, 1968

57. shortfin molly (Mexican molly)
Poecilia mexicana Steindachner
(*Poecilia mexicana*) Minckley and Deacon, 1968

58. green swordtail
Xiphophorus helleri Heckel
(*Xiphophorus helleri*) Minckley, 1971

59. southern platyfish
Xiphophorus maculatus (Gunther)
(*Xiphophorus maculatus*) LaRivers, 1962

ORDER PERCIFORMES

Percichthyidae - temperate basses

60. white bass
Morone chrysops (Rafinesque)
(*Roccus chrysops*) Miller and Lowe, 1964
(*Morone chrysops*) Minckley, 1973

61. striped bass
Morone saxatilis (Walbaum)
(*Roccus saxatilis*) St. Amant, 1959
(*Morone saxatilis*) Minckley, 1973

Centrarchidae - sunfishes

62. green sunfish
Lepomis cyanellus Rafinesque
(*Lepomis cyanellus*) Dill, 1944
(*Chaenobryttus cyanellus*) Minckley, 1973

63. warmouth
Lepomis gulosus (Cuvier)
(*Chaenobryttus gulosus*) Miller and Lowe, 1964
(*Lepomis gulosus*) Bailey, et al. 1970

64. bluegill
Lepomis macrochirus Rafinesque
(*Lepomis macrochirus purpurescens*) Miller and Winn, 1951
(*Lepomis macrochirus macrochirus*) Wallis, 1951
(*Lepomis macrochirus speciosus*) Shapovalov, et al., 1959
(*Lepomis macrochirus*) Moffett, 1943

65. redear sunfish
Lepomis microlophus (Gunther)
(*Lepomis microlophus*) Beland, 1953b

66. smallmouth bass
Micropterus dolomieui Lacepede
(*Micropterus dolomieu*) LaRivers and Trelease, 1952
(*Micropterus dolomieui*) Koster, 1957
(*Micropterus dolomieui dolomieui*) Minckley, 1973

67. largemouth bass
Micropterus salmoides (Lacepede)
(*Huro salmoides*) Moffett, 1942
(*Micropterus salmoides salmoides*) Wallis, 1951
(*Micropterus salmoides*) Douglas, 1952

68. white crappie
Pomoxis annularis Rafinesque
(*Pomoxis annularis*) Dill, 1944

69. black crappie
Pomoxis nigromaculatus (Lesueur)
(*Pomoxis nigro-maculatus*) Dill, 1944
(*Pomoxis nigromaculatus*) LaRivers and Trelease, 1952

Percidae - perches

70. yellow perch
Perca flavescens (Mitchill)
(*Perca flavescens*) Dill, 1944

71. walleye
Stizostedion vitreum vitreum (Mitchill)
(*Stizostedion vitreum*) Minckley and Johnson, 1968

Cichlidae - cichlids

72. convict cichlid
Cichlasoma nigrofasciatum (Gunther)
(*Cichlasoma nigrofasciatum*) Minckley, 1971

73. banded cichlid
Cichlasoma severum (Heckel)
(*Cichlasoma severum*) Hubbs and Deacon, 1964

74. Mozambique mouthbrooder
Tilapia mossambica (Peters)
(*Tilapia mossambica*) McConnell, 1965

75. Zilli's tilapia
Tilapia zilli
(*Tilapia zilli*) Minckley, 1973

Mugilidae - mullets

76. striped mullet
Mugil cephalus Linnaeus
(*Mugil cephalus*) Dill, 1944

Eleotridae - sleepers

77. spotted sleeper
Eleotris picta Kner and Steindachner
(*Eleotris picta*) Hubbs, 1953

Gobiidae - gobies

78. longjaw mudsucker
Gillichthys mirabilis Cooper
(*Gillichthys detrusus*) Evans and Douglas, 1950
(*Gillichthys mirabilis*) Miller, 1952b

Cottidae - sculpins

79. mottled sculpin
Cottus bairdi Girard
(*Cottus bairdi semiscaber*) Miller, 1952b
(*Cottus bairdi*) Minckley, 1971

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FISH DISTRIBUTION AND ABUNDANCE

The physical changes in the lower Colorado River brought about by the construction of numerous dams have resulted in a dramatic change in the river's ichthyofauna. At the turn of the century fewer than 25 species of fish were present in the mainstem including both native and non-native. After the completion of Hoover Dam in 1935, the number of fish species exploded. For example, more than 20 species were introduced in the 1950's alone! This report deals with those fishes known to have, at one time or another, occurred in the mainstem of the lower Colorado River from Lees Ferry to the International Boundary. Included are species recorded from bait tanks, canals, backwaters and tributaries adjacent to the mainstem (within a mile) which could conceivably get into the mainstem. Also, the Virgin River spinedace, woundfin, Moapa dace and White River killifish are included because part of their historic range in the Virgin and Moapa Rivers was inundated by Lake Mead (W.L. Minckley, pers. comm., 1978).

The distribution and abundance of these fishes from circa 1880 to the present are presented in the following charts. The fishes are organized numerically according to the fish synonymy in the first section of this report. A brief narrative for each species describing its current status in the river precedes each fish distribution and abundance chart.

For the purpose of this report, each fish occurrence or sampling location is considered first by region. The accompanying maps (Figs. 1-4) indicate which portion of the river a given numerical region covers. These numerical divisions correspond to the hydrologic regions formulated by the U.S. Geological Survey and displayed on their 1974 Hydrolic Unit Map for the State of Arizona. These divisions are also consistent with other sections of this report and with other water resource related studies. The lettered subdivisions that accompany the number correspond to river locations divided by dams or other physical barriers to fish movements. Secondly, the fish occurrences are documented by the river mile system developed by the Pacific Southwest Interagency Committee, Water Management Technical Subcommittee in their report dated January 1976.

The information compiled in the charts was obtained from various annotated fish lists, historical accounts, personal communications with knowledgeable individuals, and fish sampling surveys.

Fish abundance data as detailed in this report was obtained directly from the literature and not subjected to additional interpretation or analysis.

In addition to the fishes' occurrence and abundance, information regarding the date of the study, method of the sampling, collector, museum containing the fish specimens, and other pertinent facts are also included. The numbers in the last column of the charts correspond to the sources from which the information was obtained. All sources are listed numerically in the bibliography at the end of the report.

ABBREVIATIONS FOR THE FISH DISTRIBUTION AND ABUNDANCE LIST

Collector

AGF	Arizona Game and Fish Department
BR	Bureau of Reclamation
CFG	California Department of Fish and Game
GCNP	Grand Canyon National Park
LCRBR lab	Lower Colorado River Basin Research lab
NFG	Nevada Department of Fish and Game
NPS	National Park Service
UAAD	University of Arizona Anthropology Department
UNLV	University of Nevada at Las Vegas
USFWS	U.S. Fish and Wildlife Service
Zool. 414	Fisheries Management class at ASU

Method

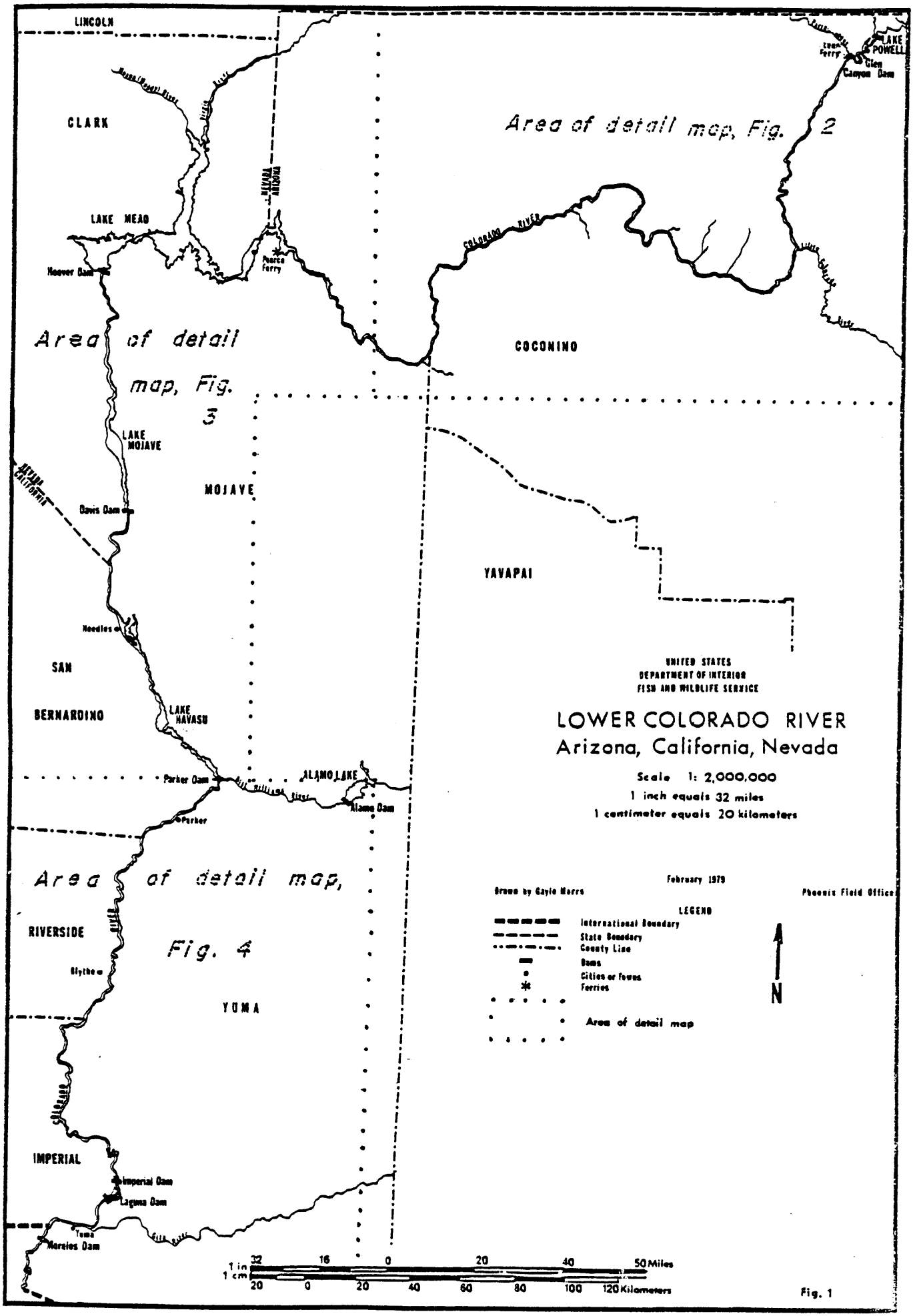
Ag	angling, fishing, hook and line
CC	creel census
EF	electrofishing
GN	gill net
HS	hand seine
Ob	observation
P	poison
Rt	rotenone
Sn	seine
SMMS	small mesh minnow seine
SN	scape net
Tr	trapping
TN	trammel net
TS	tied seine

Collections and Institutions

ASU	Arizona State University Ichthyological Museum Register, Tempe, Arizona
CAS	California Academy of Science, San Francisco, California
LMRA	Lake Mead Recreation Area/Boulder Dam National Recreation Area
MNA	Museum of Northern Arizona, Flagstaff, Arizona
NAU	Northern Arizona University, Flagstaff, Arizona
SU	Stanford University, Palo Alto, California
TU	Tulane University, New Orleans, Louisiana
UCFRU	Utah Cooperative Fisheries Research Unit, Logan, Utah
UMMZ	University of Michigan Museum of Zoology, Ann Arbor, Michigan
USNFWL	US National Fish and Wildlife Laboratory
USNM	US National Museum, Washington, D.C.
UU	University of Utah, Salt Lake City, Utah

Abundance

a	abundant
c	common
r	rare


LINCOLN
CLARK
LAKE MEAD
Hoover Dam
Pierce Ferry
Area of detail map, Fig. 2
COLORADO RIVER
LAKE POWELL
Glen Canyon Dam
Area of detail map, Fig. 3
COCONINO
LAKE MOJAVE
MOJAVE
Davis Dam
YAVAPAI
Needles
SAN BERNARDINO
LAKE HAVASU
Parker Dam
ALAMO LAKE
Alamo Dam
Parker
Area of detail map, Fig. 4
RIVERSIDE
Blythe
YUMA
IMPERIAL
Imperial Dam
Laguna Dam
Yuma
Morelos Dam
UNITED STATES
DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
LOWER COLORADO RIVER
Arizona, California, Nevada
Scale 1: 2,000,000
1 inch equals 32 miles
1 centimeter equals 20 kilometers
February 1979
Drawn by Gayle Morris
Phoenix Field Office
LEGEND
International Boundary
State Boundary
County Line
Dams
Cities or Towns
Ferries
Area of detail map
N
1 in 32 16 0 20 40 50 Miles
1 cm 20 0 20 40 60 80 100 120 Kilometers
Fig. 1

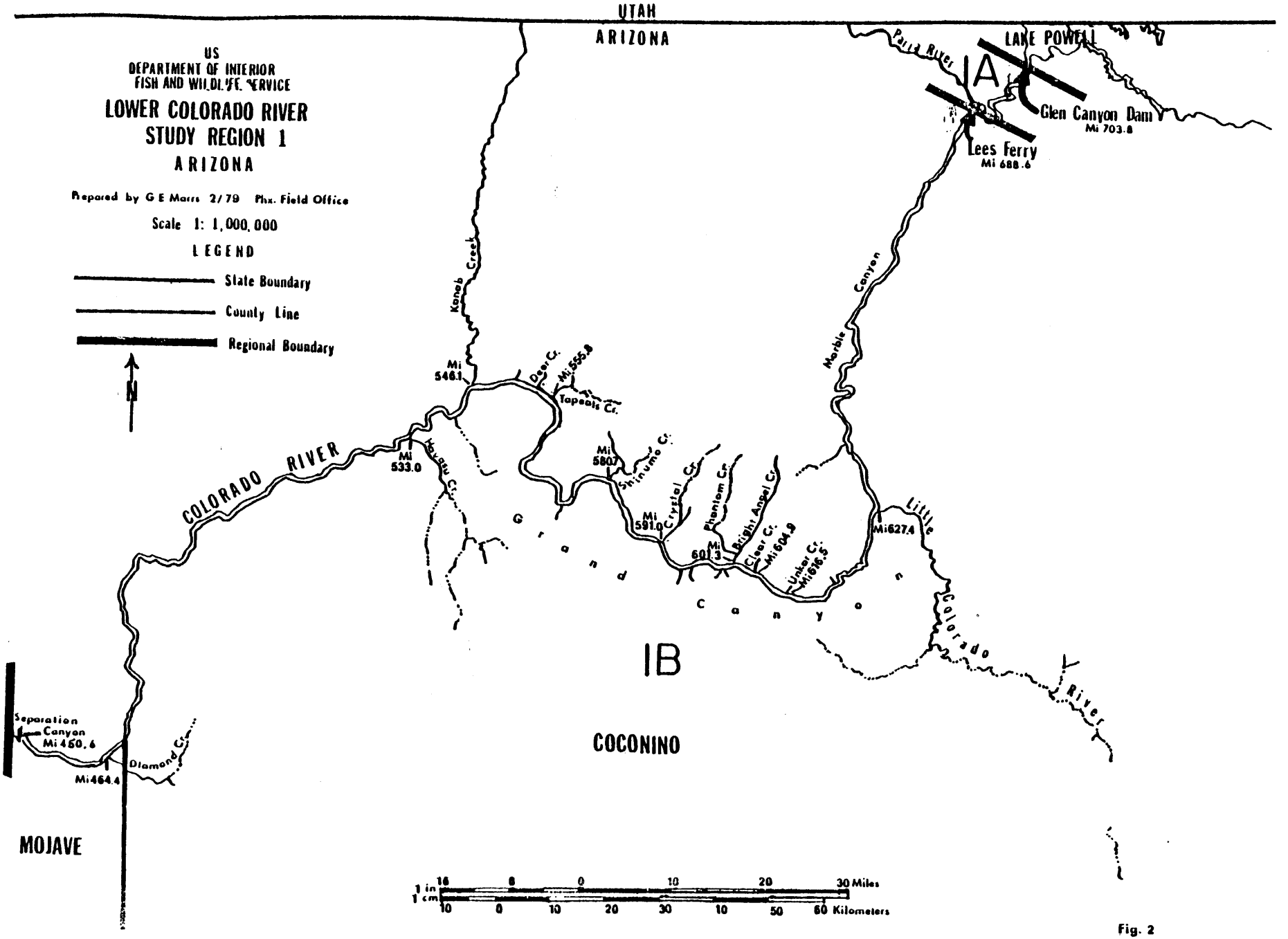

US
DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
LOWER COLORADO RIVER
STUDY REGION 1
ARIZONA
Prepared by G E Marrs 2/79 Phx. Field Office
Scale 1: 1,000,000
LEGEND
State Boundary
County Line
Regional Boundary
N
UTAH
ARIZONA
LAKE POWELL
Paria River
Glen Canyon Dam
Mi 703.8
Lees Ferry
Mi 688.6
Kanab Creek
Marble Canyon
Mi 546.1
Deer Cr.
Mi 555.8
Tapeats Cr.
COLORADO RIVER
Mi 533.0
Havasu Cr.
Mi 580.7
Shinumo Cr.
Mi 591.0
Crystal Cr.
Phantom Cr.
Bright Angel Cr.
Mi 601.3
Clear Cr.
Mi 604.9
Unkar Cr.
Mi 616.5
Mi 627.4
Little Colorado River
Grand Canyon
IB
COCONINO
Separation Canyon
Mi 450.6
Diamond Cr.
Mi 464.4
MOJAVE
1 in 16 8 0 10 20 30 Miles
1 cm 10 0 10 20 30 10 50 60 Kilometers

Fig. 2

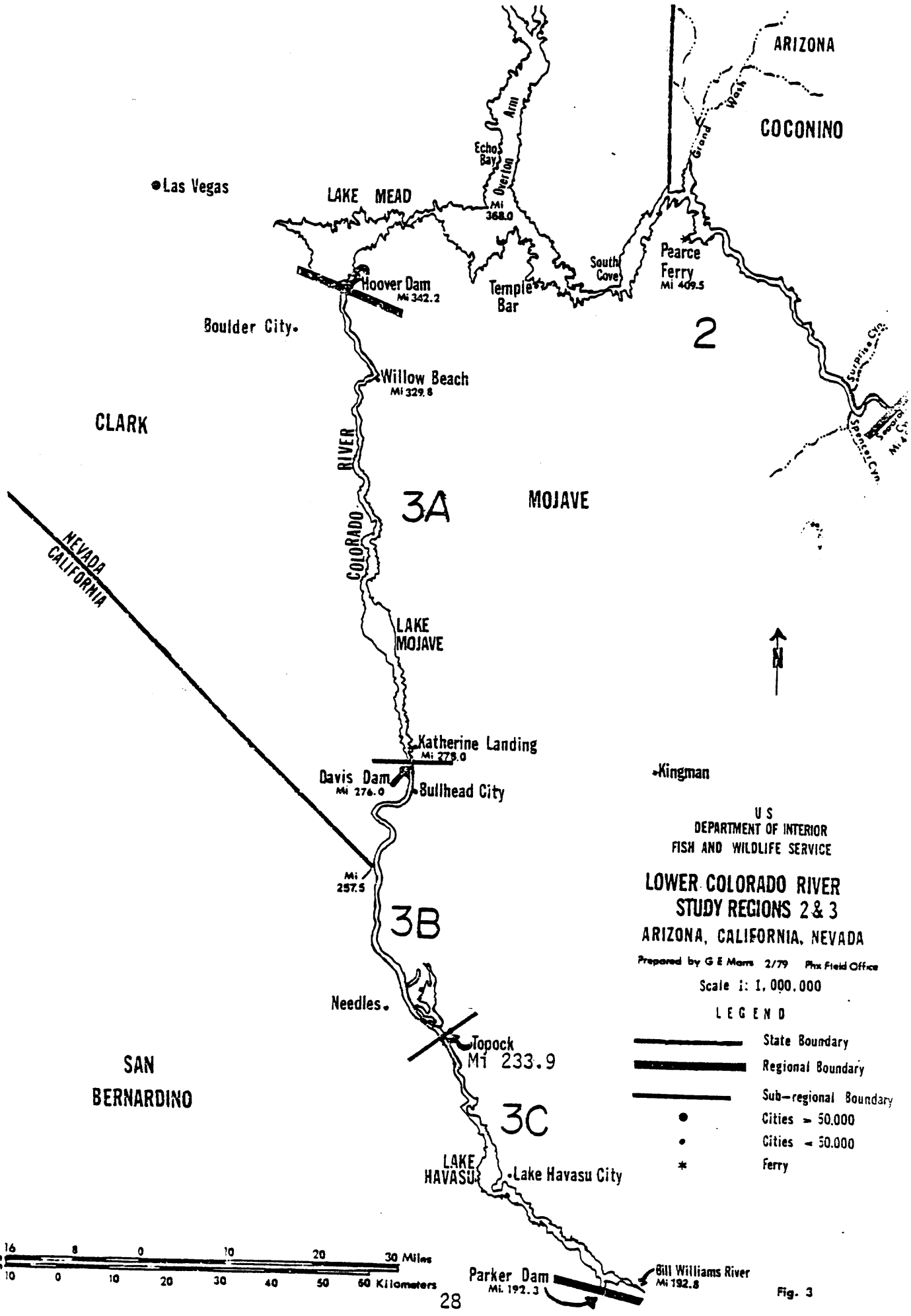

ARIZONA
COCONINO
Las Vegas
LAKE MEAD
Echo Bay
Overton Arm
Mi 368.0
Grand Wash
South Cove
Pearce Ferry
Mi 409.5
Hoover Dam
Mi 342.2
Temple Bar
Boulder City
2
Willow Beach
Mi 329.8
CLARK
COLORADO RIVER
3A
MOJAVE
NEVADA
CALIFORNIA
LAKE MOJAVE
Katherine Landing
Mi 279.0
Davis Dam
Mi 276.0
Bullhead City
Kingman
Mi 257.5
3B
Needles
Topock
Mi 233.9
SAN BERNARDINO
3C
LAKE HAVASU
Lake Havasu City
Parker Dam
Mi 192.3
Bill Williams River
Mi 192.8
1 in 16 8 0 10 20 30 Miles
1 cm 10 0 10 20 30 40 50 60 Kilometers
U S
DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
LOWER COLORADO RIVER
STUDY REGIONS 2 & 3
ARIZONA, CALIFORNIA, NEVADA
Prepared by G E Morris 2/79 Phx Field Office
Scale 1: 1,000,000
LEGEND
State Boundary
Regional Boundary
Sub-regional Boundary
Cities > 50,000
Cities < 50,000
Ferry

Fig. 3

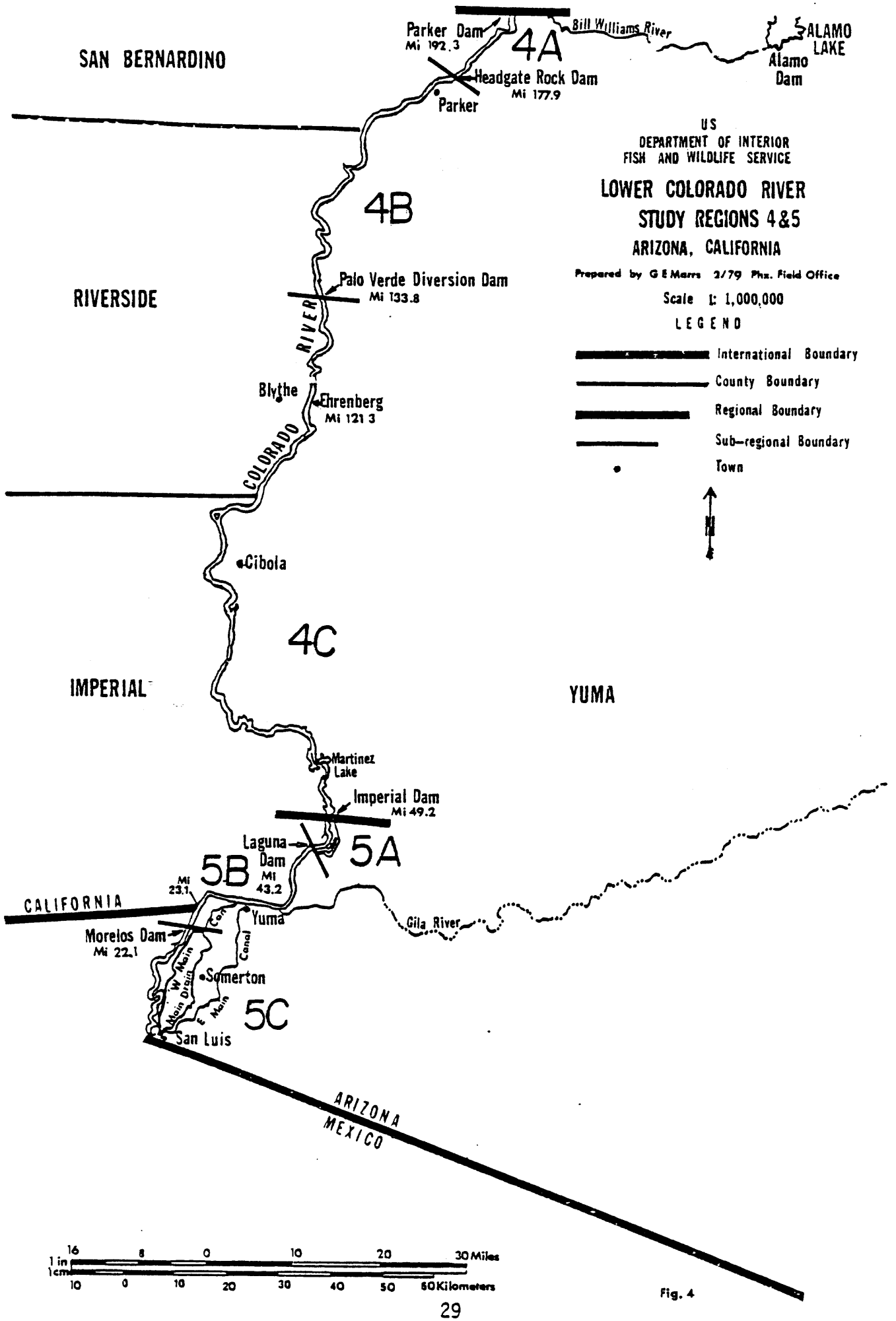

SAN BERNARDINO
Parker Dam
Mi 192.3
4A
Bill Williams River
ALAMO LAKE
Alamo Dam
Headgate Rock Dam
Mi 177.9
Parker
US
DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
LOWER COLORADO RIVER
STUDY REGIONS 4&5
ARIZONA, CALIFORNIA
Prepared by G E Marrs 2/79 Phx. Field Office
Scale 1: 1,000,000
LEGEND
International Boundary
County Boundary
Regional Boundary
Sub-regional Boundary
Town
4B
RIVERSIDE
Palo Verde Diversion Dam
Mi 133.8
COLORADO RIVER
Blythe
Ehrenberg
Mi 121.3
Cibola
4C
IMPERIAL
YUMA
Martinez Lake
Imperial Dam
Mi 49.2
Laguna Dam
Mi 43.2
5A
5B
Mi 23.1
CALIFORNIA
Yuma
Gila River
Morelos Dam
Mi 22.1
Main Canal
W Main Drain
E Main
Somerton
5C
San Luis
ARIZONA
MEXICO
16 8 0 10 20 30 Miles
1 in
1 cm
10 0 10 20 30 40 50 60 Kilometers

Fig. 4

1. white sturgeon
Acipenser transmontanus

classification: non-native, game fish
occurrence: Lake Havasu (Minckley, 1973)
rel. abundance: uncertain, area of introduction may be unsuitable for this species (Minckley, 1973)
date of intro.: 1967 in Lake Havasu by California Fish and Game (see stocking records)

2. machete - Pacific tenpounder, "anchovie", awa, awaawa, big-eyed herring, big-sized herring, bonefish, bonyfish, chiro, "gar", horse-mackerel, Jack Mariggle, jackmariddle, large-mouth herring, lisa francesca, matjuiloreal, "pike", "tarpon" (Dill, 1944)
Elops affinis

classification: native, game fish
occurrence: lower portion of river with Imperial Dam as upper limit (Miller and Lowe, 1967; Dill, 1944)
rel. abundance: exceedingly rare (Minckley, 1967)
date of intro.: first recorded from Colorado mainstem in 1941 (Glidden, 1941)
museum coll.: ASU, Stanford University

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
lower Colo. River	5A	49.2-43.2							99
Imperial Dam	5A	49.2		L. Shaporalov	1958				48
lower Colo. River	5B	43.2-22.1							99
Laguna Dam	5B	43.2		G.H. Glidden	1941				48
Laguna Dam	5B	43.2		L.C. Goldman	7/15/1941		SU		35
Yuma, Arizona	5B	30.8-28.6			Aug. 1941				36

2. machete (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
lower Colo. River	5C	22.1-0							99
Alamo Canal	5C	ca. 22.1		S.P. Dill et al.	1/19/1942	GN			35
Morelos Dam	5C	22.1	1	W.L. Minckley	mid 1960's				101
Morelos Dam	5C	22.1		E. McClendon D. Williams	3/19/1966		ASU		15
Hunter's Hole	5C	2.4		AGF	1968				101
Hunter's Hole	5C	2.4		AGF	1970				101
Hunter's Hole	5C	2.4		AGF	1974				101
Hunter's Hole	5C	2.4	1	AGF	1974	Ob		adult fish	101

3. freshwater eel
Anguilla sp.

classification: non-native, bait fish
occurrence: isolated specimens from Overton Arm and Las Vegas bay, Lake Mead
rel. abundance: incidental, only two reports of this species in 1972 (Minckley, 1973)
date of intro.: uncertain, perhaps early 1970's through the bait industry

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Overton Arm (Lake Mead)	2	368.0	1	D. Lockard	1972	Ag			97
Las Vegas Wash (Lake Mead)	2	347.5	1	T.E. Hodson	1973	Ag		was not confirmed	97

4. American shad
Alosa sapidissima

classification: non-native, forage fish
occurrence: area of Needles, California (Taggart, 1885)
rel. abundance: not established, stocked once (see stocking records)
date of intro.: planted in 1884 by US Fish Commission and Arizona Fish Commission (see stocking records)

5. threadfin shad
Dorosoma petenense

classification: non-native, forage and bait fish
occurrence: Lake Mead to Yuma and tailwaters of Glen Canyon Dam, absent from turbulent waters of Grand Canyon (Minckley, 1973)
rel. abundance: abundant (Miller and Lowe, 1964)
date of intro.: 1953 in Overton Arm, Lake Mead by Tri-State Agreement - Arizona, California and Nevada (La Rivers, 1962)
museum coll.: Tulane University, ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Spencer Creek	1B	458.2		Suttkus et al.	1970-1976	SMMS	TU		126
Emery Falls	2	415.0		Suttkus et al.	1970-1976	SMMS	TU		126
Scorpion Island	2	409.1		Suttkus et al.	1970-1976	SMMS	TU		126
Lake Mead	2	409.7-342.2	a						70
Lake Mead	2	409.7-342.2	a	AGF	6/1/1961	Ob, GN		upper reaches	84
Colorado River	3A	342.2-276							99
Colorado River	3B	276.0-233.9							99

5. threadfin shad (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mead to Mexico	2-5C	342.0-0.0			1956				75
Lake Mohave	3A	342.2-276	a	AGF	June 1961	Ob, GN			84
lower Colo. River	36	223.9-192.3							99
Lake Havasu	3C	223.9-192.3			1953			stocked by CFG	79
Lake Havasu	3C	223.9-192.3	30,000-50,000		1955	Rt		1 acre cove in L. Havasu	71
Lake Havasu	3C	213.9	600	CFG	Oct. 1955			stocked 20 mi. below Topock	57
lower Colo. River	4A	192.3-177.9							99
lower Colo. River	4B	177.9-133.8							99
Colorado River	4A	183.9		J.J. Londgi W.G. Kupner	12/20/1975				
Deer Island Lake	4B	172.0-169.1	100	M.K. Saiki J.C. Tash	1973-1974	EF			112
Deer Island Lake	4B	172.0-169.1	153	M.K. Saiki et al.	Jan. 1975	EF		made up 26% of sample	110
Colorado River	4B	163.0		LCRBR lab	6/14/1974		ASU		15
Colorado River	4B	143.2		LCRBR lab	6/19/1974		ASU		15
lower Colo. River	4C	133.8-49.2							99
Colorado River	4C	133.6		LCRBR lab	6/21/1974		ASU		15
Backwater A-7	4C	118.7	a	M.A. Singer et al.		GN(Nov-Mar) EF Mar-Oct			115
10.5 KM downstream from Ehrenberg Bridge	4C	114.3		M.A. Singer et al.	Nov. 1971-Oct. 1972	GN(Nov-Mar) EF Mar-Oct			115

5. threadfin shad (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Backwater A-10	4C	113.8		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Walter's Camp	4C	88.3	14	P.D. Ashley et al.	1973	GN			133
Martinez Lake	4C	56.3		Zool. 414	2/14/1976		ASU		15
Laguna division	5A	49.2-43.2							99
Yuma division	5B	43.2-22.1							99
lower Colo. River	5C	22.1-0							99
Morelos Dam	5C	22.1		D. McClendon D. Williams	3/19/1966		ASU		15
Colorado River	5C	20.1		LCRBR lab	6/18/1975		ASU		15
Gadsden Lake	5C	2.4		LCRBR lab	9/21/1974		ASU		15
Hunter's Hole	5C	2.4		W.L. Minckley R. McNatt	4/5-7/1974				101

6. coho salmon - silver salmon
Oncorhynchus kisutch

classification: non-native, game fish
occurrence: was planted below Glen Canyon Dam and in Lake Mead and Mohave (see stocking records); one individual found in Grand Canyon (Suttkus et al., 1976)
rel. abundance: no longer found in either Lake Mead or Lake Mohave (NFG, 1978)
date of intro.: stocked in 1966 by Nevada Fish and Game (see stocking records)
museum coll.: Tulane University

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
old river mile 194.5	1B	494.1	1	Suttkus et al.	9/16/1971	SMMS	TU		117

7. sockeye salmon - kokanee salmon, blue back salmon
Oncorphynchus nerka

classification: non-native, game fish
occurrence: planted in Lake Mohave (see stocking records)
rel. abundance: no known reproducing populations in river (Minckley, 1973); no longer found in Lake Mohave (Nevada Fish and Game, 1978)

date of intro.: 1962 in Lake Mohave by Nevada Fish and Game (see stocking records)

8. cutthroat trout, Colorado cutthroat trout
Salmo clarki

classification: non-native, game fish
occurrence: various places along the mainstem from the Grand Canyon to Imperial County, California (see references next page); stocked fairly regularly in Lakes Mead and Mohave (see stocking records)
rel. abundance: must be stocked regularly, uncommon in Lakes Mead and Mohave (NFG, 1978)
date of intro.: uncertain, introduced in Arizona along with rainbow trout just before 1900 (Minckley, 1973); stocked in Lake Mohave in 1962 by NFG (see stocking records)
museum coll.: USNM

8. cutthroat trout (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Grand Canyon Nat'l Park	1B	687.7-412.3	0	R.R. Miller	1944		USNM	expected; not seen	86
Grand Canyon Nat'l Park	1B	687.7-412.3	0	R.R. Miller	1944		USNM	expected; not seen	86
Lake Mohave	3A	342.2-276.0		H. Johnson	Aug. 1978	Ag			7
Imperial County, California	5B	30.5-23.1	1	F.E. Cressey	1/21/1930	Ag		irrigation ditch connected to river	22

9. rainbow trout
Salmo gairdneri

classification: non-native, game fish
occurrence: presently throughout most of the river (see references following)
rel. abundance: abundant, stocked regularly (see stocking records)
date of intro.: introduced in Arizona just before 1900 (Minckley, 1973); stocked in Grand Canyon in 1922 by US Forest Service (see stocking records)
museum coll. TU, UCFRU, ASU, USNM

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
100 yards below Glen Canyon Dam	1A	703.7	a	P.B. Holden	7/67 8/70	GN	UCFRU		60
Grand Canyon Nat'l Park	1B	687.7-412.3		R.R. Miller	1942		USNM		86
Grand Canyon Nat'l Park	1B	687.7-412.3		R. Suttkus et al.	1970-1976	SMMS	TU		126
Marble Canyon	1B	684.2	c	P.B. Holden, C.B. Stalnaker	1967-1973	GN Sn	UCFRU		63
Shinumo Cr.	1B	659.6		P.B. Holden	5/71	Ag			60
Little Colo. River	1B	627.4	1	R.R. Miller					92

9. rainbow trout (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Bright Angel Cr.	1B	601.3	a		1930				82
Bright Angel Cr.	1B	601.3			1/29/ 1939		ASU		15
Bright Angel Cr.	1B	601.3	1	C.O. Minckley D.W. Blinn	7&8/ 1975	Sn	NAU		93
Elves Chasm	1B	572.8	3	C.O. Minckley D.W. Blinn	7&8/ 1975	Sn	NAU		93
Tapeats Creek	1B	555.8		A. J. Malmquist	1970	Ag			80
Tapeats Creek	1B	555.8	14	C.O. Minckley D.W. Blinn	7&8/ 1975	Sn	NAU		93
Lower Colo. River	3A	342.2-276.0							99
Lake Mohave	3A	342.2-276.0	a	NFG	8/50-6/54	Ob,CC, GN			68
Lake Mohave	3A	342.2-276.0	a		1951			95% of catch	8
Lake Mohave	3A	342.2-276.0		Anglers	1968	Ag			43
Lake Mohave	3A	342.2-276.0		LCRBR lab	3/29/ 1975		ASU		15
Upper Lake Mohave	3A	ca 342.2-309.1		O.C. Wallis	1950				59
Roaring Spring	3A	326.3			2/19/ 1932		ASU		15
Cottonwood Landing	3A	298.3		W.L. Minckley	2/3-6/ 1977		ASU		15
Lower Colo. River	3B	276.0-223.9							99
500 yards below Davis Dam	3B	275.7		R. Mauer	4/19/ 1964		ASU		15
14 mi. below Davis Dam	3B	262.0	a	NFG	7/50-6/54	CC Ag			68
Lower Colo. River	3C	223.9-192.3							99

9. rainbow trout (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Havasu	3C	223.9-192.3	3		1941-1942	Ag			35
Lake Havasu	3C	223.9-192.3	r		1954				19
Parker Division	4A	192.3-177.9							99
Deer Island Lake	4B	172.0-169.1	a	M.K. Saiki et al.	Jan. 1975	EF		82% of samples	110
Palo Verde Slough	5C	133	1	J.B. Bowen	1943	Ag			35

10. brown trout - German brown trout, Loch Leven trout
Salmo trutta

classification: non-native, game fish
occurrence: collected from tailwaters of Glen Canyon Dam to below Davis Dam (see references following)
rel. abundance: rare in Lake Mead, to be stocked in future by NFG (NFG, 1978)
date of intro.: in 1924, 50,000 brown trout eggs were planted in Bright Angel Creek by the National Park Service (Williamson and Tyler, 1924)
museum coll.: ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
tailwaters of Glen Canyon Dam	1A	703.7	1	AGF	7/1/71-6/30/72	GN			124
Bright Angel Cr.	1B	601.3	a		1930	Ag			82
Lake Mead	2	409.7-342.2	r	NFG	7/51-7/54	GN,Ag, T,S,P			68
Las Vegas Wash	2	347.5	1	P.E. Kitcher	4/6/1949	Ag			147
Lake Mohave	3A	342.2-276.0	r	NFG	7/50 6/54	Ob,CC, GN			68
500 yds below Davis Dam	3B	275.7		W.L. Minckley	4/9/1964		ASU		15

11. brook trout
Salvelinus fontinalis

classification: non-native, game fish
occurrence: Grand Canyon (see references below)
rel. abundance: rare in Lake Mohave (NFG, 1978): populations maintained by stocking (Minckley, 1973)
date of intro.: in 1920, 5,000 individuals stocked in Bright Angel Creek, Grand Canyon by National Park Service (Williamson and Tyler, 1924)
museum coll.: ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Clear Creek	1B	604.9		L. Schell-bach	5/10/ 1977		ASU		15
Clear Creek	1B	604.9	50,000		1928& 1931			stocked by NPS	147
Bright Angel Cr.	1B	601.3	5,000		1920			stocked by NPS	147
Havasu Creek	1B	533.0	10,000		1927			stocked by NPS	147

12. Mexican tetra - Texas banded tetra, Mexican banded tetra, banded tetra
Astyanax fasciatus mexicanus

classification: non-native, bait fish
occurrence: southern portion of mainstem (Minckley, 1973)
rel. abundance: uncertain, established populations around Morelos Dam (ASU Mus. Reg.)
date of intro.: 1950, from Yuma bait fish shop (Miller, 1952)
museum coll.: ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Fishermans Landing	4C	56.0		W.A. Evans P.A. Douglas	1950			found in bait shop	88
Morelos Dam	5C	22.1		E. McClendon D. Williams	3/19/ 1966		ASU	found in bait shop	15

12. Mexican tetra (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
below Morelas Dam	5C	22.1	4		1966	Sn			97
Limitrophe region	5C	22.1-							99

13. longfin dace
Agosia chrysogaster

classification: native to Gila River drainage, bait fish (currently not a bait fish in Arizona)
occurrence: recorded in bait tanks along lower Colorado River below Lake Mead
rel. abundance: not established in mainstem, though abundant in Bill Williams River drainage
date of intro.: first seen along mainstem in 1948 from Shorty's Bait Shop, Topock, Arizona (Miller, 1952)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Shorty's Bait Shop, Topock	3C	233.9		L. Rossier	4/2/ 1948				88
Shorty's Bait Shop, Topock	3C	233.9		L. Rossier	6/13/ 1949				88
Shorty's Bait Shop, Topock	3C	233.9		L. Rossier	4/7/ 1950				88
Shorty's Bait Shop, Topock	3C	233.9		L. Rossier	Dec. 1950				88

14. goldfish
Carassius auratus

classification: non-native, bait fish
occurrence: present in all major reservoirs of the lower Colorado River basin (Minckley, 1969)
rel. abundance: rare in Lake Mead (NFG, 1978); does not achieve great abundance (Minckley, 1969)
date of intro.: recorded in 1944 as baitfish (Dill, 1944)

14. goldfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Temple Bar	2	378.5		O.C. Wallis	4/16/ 1951			baitfish	88
lower Colo. River	3B	276.0-223.9							99
lower Colo. River	3C	223.9-192.3							99
lower Colo. River	4A	192.3-177.9							99
A-7 at Ehrenberg	4C	120.6		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF remainder			115
lower Colo. River	5B	43.2-22.1							99
lower Colo. River	5C	22.1-0							99
Hunters Hole	5C	2.4		AGF		EF			101

15. carp
Cyprinus carpio

classification: non-native, non-game fish
occurrence: throughout the mainstem (see references below)
rel. abundance: common in Grand Canyon (Holden and Stalnaker, 1975); abundant in Lakes Mead and Mohave (NFG, 1978); common in lower portion of river (Miller and Lowe, 1964)
date of intro.: 1890 (Gilbert and Scofield, 1898)
museum coll.: ASU, UCFRU, TU, SU, UNLV

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Glen Canyon Dam	1A	703.8		P.B. Holden C.B. Stalnaker	1967& 1970	GN,Sn, EF,Ag	UCFRU	collected in small numbers	63
Glen Canyon Dam to Lees Ferry	1A	703.8-688.6	11	AGF	1964	EF			123

15. carp (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Grand Canyon	1B	688.6-409.7	12	R. Suttkus et al.	6/9/1975	SMMS	TU		126
Grand Canyon	1B	688.6-409.7	21	R. Suttkus et al.	7/29/1975	SMMS	TU		126
Grand Canyon	1B	688.6-409.7		P.B. Holden C.B. Stalnaker	1970-1972	EF, Sn Nets	UCFRU	collected in small no.s	63
Marble Canyon	1B	684.2		P.B. Holden C.B. Stalnaker	1973	EF, Ag	UCFRU	collected in small no.s	63
Crystal Creek	1B	591.0	r	C.O. Minckley D.W. Blinn	8&9/1975	Sn	NAU		93
Old Mile-post 253	2	435.6	2	J. Deacon J. Baker	3,4,& 10/76		UNLV		34
Lake Mead	2	409.7-342.2	a	J.W. Moffett	ca 1941-1942	Ag,GN, Sn		most abundant fish in lake	104
Lake Mead	2	409.7-342.2	a		1946				91
Lake Mead	2	409.7-342.2		O.L. Wallis	1950			spread extensively	59
Lake Mead	2	409.7-342.2	c	A. Jonez R. Sumner	8/51-6/54	Ag,Sn, P,Tr			68
Lake Mead	2	409.7-342.2	c	J. Deacon G. Bradley	1972				31
Driftwood Cove Lake Mead	2	401.4	2	NFG	1972	Ob			136
Driftwood Cove Lake Mead	2	401.2	12	Romero, Groom, Johnson	11/2/1973	Ob			134
North Bay, Lake Mead	2	396.0	12	NFG	1972	Ob			136
South Cove	2	393.5	7	Romero, Groom, Johnson	11/1/1973	Ob			134
Campanile, Lake Mead	2	375.0	numerous	NFG	1972	Ob			136
Grebe Bay, Lake Mead	2	372.7	numerous	NFG	1972	Ob			136
Lower Moapa R. (Overton Arm)	2	368.0	2	J. Deacon G. Bradley	1964	SN,TS, EF	UNLV		35

15. carp (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Moapa River	2	368.0	9	J. Deacon G. Bradley	1965	EF	UNLV		35
Lower Moapa River	2	368.0	25	J. Deacon G. Bradley	1966	SN EF	UNLV		35
Lower Moapa River	2	368.0	10	J. Deacon G. Bradley	1967	SN EF	UNLV		35
Lower Moapa River	2	368.0	11.5	J. Deacon G. Bradley	1964-1967		UNLV	yearly mean	35
Overton Arm, Lake Mead	2	368.0	18	NFG	9/28-29/72	Ob			131
Echo Bay (Overton Arm)	2	368.0	11	Romero, Groom, Johnson	11/2/1973	Ob			134
Echo Bay	2	368.0	21	Romero, Groom, Johnson	11/2/1973	Ob			134
Calville Bay, Lake Mead	2	351.5	numerous	NFG	1972	Ob			131
Swallow Bay, Lake Mead	2	349	10	NFG	1972	Ob			131
Lake Mohave	3A	342.2-276.0	c		1951				8
Lake Mohave	3A	342.2-276.0	c	AGF	June 1961	Ob			84
Lower Colo. River	3A	342.2-276.0							99
Lower Colo. River	3B	276.0-223.9							99
14 miles below Davis Dam	3B	262.0	c	A. Jonez R. Sumner	7/50-6/54	Ag		throughout river prior to Davis Dam	68
Needles Boat Landing	3B	ca 244.4	7	L. Rossier P.A. Douglas	3/17/1950	Nets			37
Lower Colo. River	3C	223.9-192.3							99
Topock	3C	233.9		J. Grinnell	1910	Sn	SU		52
Lake Havasu	3C	233.9-192.3	c						53

15. carp (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Havasu	3C	233.9-192.3	a						19
Lake Havasu	3C	233.9-192.3	c		1954				19
Lake Havasu	3C	233.9-192.3	c		1973				109
Lake Havasu	3C	214.0	c	R.D. Beland	1951	GN			19
Colo. River Aqueduct	3C	194.3	c						19
Lower Colo. River	4A	192.3-177.9							99
Moovayla Lake	4A	191.5-177.9	104	G. Kobetich	1972	GN		carp dominated habitat after 1972	98
Deer Island Lake	4A	176.0-169.1		M.K. Saiki et al.	Jan. 1975	EF			110
Lower Colo. River	4B	177.9-133.8							99
Backwater A-7	4C	118.7	c	M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF remainder			115
Lower Colo. River	4C	133.8-49.2							99
Walters Camp	4C	88.3							133
Lower Colo. River	4C	59.3		LCRBR lab	6/19/1974		ASU		15
Laguna region	5A	49.2-43.2							99
Yuma region	5B	43.2-22.1							99
main outlet, Yuma desaltation plant	5C	22.1			1973				132
Lower Colo. River	5C	19.2		LCRBR lab	Aug. 1973		ASU		15
Hunters Hole	5C	2.4	15	W.L. Minckley	1974	GN,EF	ASU		101

16. Utah chub
Gila atraria

classification: non-native, bait fish
occurrence: recorded twice from bait tanks along Lake Mohave
rel. abundance: not established
date of intro.: first recorded in 1951 from bait tanks (Minckley, 1952)
museum coll.: Univ. of Utah

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Aztec and Glen Canyons		757.2	5	G. Smith G. Musser D. McDonald	6/30-8/8/1958	Rt	UU		119
Needles Boat Landing	3B	244.4		B. Boland	Apr. 1951	Ob		B. Boland identified	88
Shorty's Bait Shop, Topock	3C	233.9		R.R. Miller and party	4/7/1950				88
Shorty's Bait Shop, Topock	3C	233.9		R.D. Beland	Dec. 1950			determined by Hubbs	88
Kinders Camp	3C	182.0		R.R. Miller and party	4/7/1950				88
Kinders Camp	3C	182.0		P.A. Douglas	6/21/50				88
Murphys Windmill Camp	4C	c. 90		R.D. Beland	2/3/1951				88

17. leatherside chub
Gila copei

classification: non-native, bait fish
occurrence: found in bait shops along the river from Lake Mead to Lake Havasu
rel. abundance: not established
date of intro.: around 1950 as bait fish (Miller, 1952)

17. leatherside chub (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mead boat dock	2	ca 250.0		R.K. Grater	8/1/ 1950			bait fish	88
Havasu Spring Resort	3B	276.0		R.D. Beland	4/10/ 1951			bait fish	88
Shorty's Bait Shop, Topock	3C	233.9		R.D. Beland	1950			bait fish	88
Shorty's Bait Shop, Topock	3C	233.9		R.R. Miller and party	4/7/ 1950			bait fish	88
Kinders Camp	4A	182.0		R.R. Miller and party	4/7/ 1950			bait fish	88

18. humpback chub
Gila cypha

classification: native non-game; listed as endangered in Federal Register, March 11, 1967; on Arizona Threatened & Unique Species listing and Nevada's Classification of Wildlife list, October 21, 1978 and March 6, 1978, respectively.

occurrence: specialized for warm, turbulent waters; once occurred downstream below Hoover Dam (Miller, 1955) and upstream in large portions of the main river - now restricted to the Grand Canyon and above (Minckley, 1973); rare below Lake Mead (Minckley, 1969)

rel. abundance: once common, now rare (Miller and Lowe, 1964); considered extinct in Lakes Mead and Mohave by Nevada Fish and Game (1978)

museum coll.: ASU, TU, GCNP, UCFRU, UAAD, USNM

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Powell area	1A	703.8		AGF	1961-1963		ASU		15
Glen Canyon Dam	1A	703.8		AGF	1961-1963		ASU		15
Glen Canyon Dam	1A	703.8	r	P.B. Holden R.B. Stalnaker	7/67 & 8/70	GN, SN,EF, Ag	UCFRU		63
tailwaters of Glen Canyon Dam	1A	703.8		AGF	winter 1966		ASU		15

18. humpback chub (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
tailwaters of Glen Canyon Dam	1A	703.8		AGF	Aug. 1969		ASU		15
100 yards below Glen Canyon Dam	1A	703.8	15	P.B. Holden	July 1967	GN	UCFRU		60
100 yards below Glen Canyon Dam	1A	703.8	1	P.B. Holden	Aug. 1970	GN	UCFRU		60
Lees Ferry	1B	688.6	15	UCFRU	1962-1970		UCFRU ASU		62
Lees Ferry	1B	688.6		Jack Jim	summer 1963		ASU		15
Grand Canyon	1B	687.7-412.3	35	Suttkus et al.			MNA TU USNFWL	specimens collected at different dates	127
Grand Canyon	1B	687.7-412.3		R.R. Miller	1942				86
Grand Canyon	1B	687.7-412.3		R.R. Miller	1946				61
Grand Canyon	1B	687.7-412.3		R.R. Miller	1968				60
Grand Canyon	1B	687.7-412.3	r	P.B. Holden	1973		UCFRU		61
Shinumo Creek	1B	659.6	1	R. Suttkus et al.	8/1/1975	SMMS	TU		126
Old River Mile 44	1B	644.6		R. Suttkus et al.	1970-1976	SMMS	TU	juvenile	126
Little Colo. River	1B	627.4	4	R. Suttkus et al.	6/2/1976	SMMS	TU		126
Old River Mile 61.5	1B	626.1		R. Suttkus et al.	1970-1976	SMMS	TU	juvenile	126
Old River Mile 69	1B	619.6		R. Suttkus et al.	1970-1976	SMMS	TU	juvenile	126

18. humpback chub (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Old River Mile 71	1B	617.6		R. Suttkus et al.	1970-1976	SMMS	TU	juvenile	126
Bright Angel Creek	1B	601.3		J. Raften	6/17/1944		ASU		15
Bright Angel Creek	1B	601.3	r	R.R. Miller		Ag	USNM		87
Bright Angel Creek	1B	601.3			June 1968		ASU		15
2 miles upstream from Phantom Ranch	1B	602.3		AGF	Spring 1973		ASU		15
Old River Mile 108.7	1B	580.9		R. Suttkus	1970-1976	SMMS	TU	juvenile	126
Lower Colo. River	2	381.2	2		1949		UAAD		89
Ehrenberg La Paz	4C	121.3		W. P. Blake	1/28/1883	Ag			20

19. bonytail - bonytail chub
Gila elegans

classification: native, non-game; proposed as endangered in Federal Register, April 24, 1978; on Arizona Threatened and Unique Species list, Nevada's Classification of Wildlife list, and California's "At the Crossroads" report, October 21, 1978, March 1978, and January 1, 1972, respectively.

occurrence: formerly in all larger rivers at the Colorado Basin (Minckley, 1969); now occurs in reservoirs of the lower Colorado River and in the Grand Canyon (Minckley, 1973)

rel. abundance: once abundant, now threatened (Holden, et al, 1974); rare in Lakes Mead and Mohave (Nevada Fish and Game, 1978)

museum coll.: ASU, SU, USNM

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Colorado swift waters									75
entire Colo. mainstem		688.6-0	c	D.S. Jordan	1891				61
entire Colo. mainstem		688.6-0	c	D.S. Jordan B.W. Evermann	1896				61

19. bonytail (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
below Glen Canyon Dam	1A	703.8		AGF	1961-1963		ASU		15
Glen Canyon Dam	1A	703.8			fall 1966		ASU		15
Glen Canyon Dam	1A	703.8		AGF	winter 1966		ASU		15
Lees Ferry	1B	688.3		J. Rinne	summer 1963		ASU		15
Grand Canyon	1B	687.7-412.3			1942		USNM		86
Phantom Creek (tributary to Bright Angel)	1B	601.3	1	C.G. Childress	8/10/1942		ASU	adult fish	15
Bright Angel	1B	601.3			6/17/1944		ASU		15
1000 yards above mouth of Spencer Creek	2	444.7	9		8/22/1955				90
Lake Mead	2	409.7-342.2		J.W. Moffett	1941	Ob			104
Lake Mead	2	409.7-342.2	r		ca. 1950				147
Lower Colo. River	3A	342.2-276.0							99
Lake Mohave	3A	342.2-276.0	51	NFG	9/14/50-2/21/54	GN			68
Lake Mohave	3A	342.2-276.0	c		1951			common in upper lake	8
Lake Mohave	3A	342.2-276.0	6	various collectors	1962-1967				62
Lake Mohave	3A	342.2-276.0	r	P. Carboni	1970				61
below Hoover	3A	342.2		J.W. Moffett	1942				102
Willow Beach	3A	329.8	9	R.R. Miller	11/41				90
Willow Beach	3A	329.8			6/14/61		ASU		15

19. bonytail (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
El Dorado	3A	316.0		R.R. Miller	4/2/ 1941				90
10 mi. below El Dorado	3A	306.0	500	NFG	May 1954	Ob		spawning females	68
Cottonwood Cove	3A	298.2	2	W.L. Minckley et al.	4/28/ 1979	TN		2 females collected; now at WBFH	107
20 mi. north of Davis Dam	3A	296.0		LCRBR lab	4/6/ 1975		ASU		15
20 mi. north of Davis Dam	3A	296.0	4	LCRBR lab	Apr. 1975	TN		4 gravid females taken to WBFH; all died	54
above Davis Dam	3B	276.0+		G. Edwards	May 1969		ASU		15
L. Mohave;so. end Davis Dam	3B	276.0			5/28/ 1971		ASU		15
base of Davis Dam	3B	276.0	3	R.R. Miller	6/31/ 1950				90
below Davis Dam	3B	276.0	7	R.R. Miller	5/31/ 1950				90
below Davis Dam	3B	276.0	2	G. Edwards	July 1970		ASU		15
14 mi. below Davis Dam	3B	262.0		NFG	7/50-6/54			spawned successfully below Davis Dam	68
Mohave Indian Range	3B	261.3-251.1	a	Mohave Indians					146
Needles to Yuma	3B-5B	244.4-30.8	r		1942			none seen during 1942 survey	35
Lower Colo. River	3C	223.9-192.3							99
Topock	3C	233.9		J. Grinnel	1910	Sn	SU		52
Lake Havasu	3C	223.9-192.3	r		1954				19

19. bonytail (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
600 yds above Parker Dam	3C	192.6	1	R.R. Miller					90
Lower Colo. River	4A	192.3-177.9							99
Lower Colo. River	5A	49.2-43.2							99
Laguna Dam to Yuma	5B	43.2-30.7		Mohave Indians	prior to 1909	Weirs, Tr, Ag		prior to Laguna Dam in 1909	122
Gila River, Yuma area	5B	34.2	1	R.R. Miller					90
Yuma	5B	31.0-28.0		C.H. Gilbert N.B. Scofield	1890	Netting, Sn	USNM		120
Yuma	5B	31.0-28.0		E.G. Mearns	1892-1894		USNM		49

20. Rio Grande chub
Gila pandora

classification: non-native, bait fish
occurrence: only record of this species is from bait tanks along lower Colorado River below Lake Mead
rel. abundance: not established
date of intro.: 1950 from bait tanks

(Miller, 1952)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Intake Store	4C	121.4		W. Evans	7/5/50			bait	88

21. roundtail chub
Gila robusta

classification: native, non-game; proposed as endangered on Federal Register, August 23, 1978; on Arizona's Threatened and Unique Species list and Nevada's Classification of Wildlife list, October 21, 1978 and March 6, 1978, respectively. Two subspecies endemic to Colorado River system:

G. r. robusta - endemic to Colorado River
G. r. seminuda - endemic to Virgin River

21. roundtail chub (continued)

occurrence: G. r. robusta collected at various places along mainstem (see references in following table); G r. seminuda occurs only in lower Virgin River (Minckley, 1973)
rel. abundance: both subspecies rare, once common (Miller and Lowe, 1964)
museum coll.: ASU, UU, UNLV

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Colo. River, tributaries									75
Colorado River					1930			D.S. Jordan states this in his lists	69
No Name Canyon		762.4	1	G. Smith G. Musser D. McDonald	6/30-8/3/1958	Rt	UU	before Glen Canyon Dam	119
Aztec Canyon		757.2	1	G. Smith G. Musser D. McDonald	6/30-8/3/1958	Rt	UU		119
Kane Creek		729.2	1	G. Smith G. Musser D. McDonald	6/30-8/3/1958	HS	UU		119
Glen Canyon Dam Site	1A	703.8		AGF	1961-1963		ASU		15
below Glen Canyon	1A	703.8		AGF	winter 1966		ASU		15
Grand Canyon Nat'l Park	1B	687.7-412.3	0		1944			expected; not seem	86
Little Colo. River	1B	627.4	r	C.O. Minckley D.W. Blinn	summer 1975	SN	NAU	57 released at confluence	93
Lake Mead	2	409.7-342.2	c	J. Moffett	1941-1942				104
Lake Mead	2	409.7-342.2	3	A. Jonez R. Summer	1951-1954	Ag, Tr,Sn, GN		widely scattered throughout lake	68
Lake Mead	2	409.7-342.2	0	J.Seacon G. Bradley	1963-1968		UNLV	yearly mean	75

21. roundtail chub (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Moapa River	2	368.0	0	J. Deacon G. Bradley	1964	TS	UNLV		33
Lower Moapa River	2	368.0	0	J. Deacon G. Bradley	1965	EF SN	UNLV		33
Lower Moapa River	2	368.0	0	J. Deacon G. Bradley	1966	EF SN	UNLV		33
Lower Moapa River	2	368.0	0	J. Deacon G. Bradley	1967	EF SN	UNLV		33
Lower Moapa River	2	368.0	0	J. Deacon G. Bradley		EF SN	UNLV	yearly mean prior dates	33
below Davis Dam	3B	276.0		G. Edwards	May 1969		ASU		15
Lower Colo. River	4C	133.8-49.2							99
Imperial Dam (Marsh)	5B	49.2	2	AGF	Mar. 1973		ASU	stragglers from Bill Wms River	15
Yuma	5B	30.8-28.6	a		1904			most abundant fish in Yuma	92
Lower Colo. River	5C	22.1-0							99

22. Sacramento hitch
Lavinia exilicauda

classification: non-native, bait fish
occurrence: bait tanks along the area of Lake Havasu
rel. abundance: not established
date of intro.: 1950's in bait tanks
(Miller, 1952)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
bait tanks, Lake Havasu	3C	276.0-192.0		A. Douglas	3/2/ 1950			bait	88

22. Sacramento hitch (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Shorty's Bait Shop, Topock	3C	233.9		R.R. Miller and party	Apr. 1950			bait	88
Kinders Camp	4A	182.0		R.R. Miller and party	Apr. 1950			bait	88
Kinders Camp	4	182.0		P.A. Douglas	6/21/ 1950			bait	88

23. White River spinedace
Lepidomeda albivallis

classification: non-native, bait fish, on Nevada Protected-Unique Species List, March 6, 1978
occurrence: specimens taken from Murphy's Windmill Camp on the lower river - the only record to date of this species used as baitfish along the Colorado River; inhabits upper White River, Nevada
rel. abundance: not established
date of intro.: 1951 as bait fish

(Miller, 1952)

Occurence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Murphys Wind-Mill Camp	4C	90		R.D. Beland	2/3/ 1951			bait	88

24. Virgin River spinedace, virgin spinedace
Lepidomeda mollispinis

classification: non-game; native to Virgin River basin; on Arizona Threatened and Unique Species list, and Nevada's Classification of Wildlife list, October 21, 1978 and March 6, 1978, respectively
occurrence: lower portion of range inundated by Lake Mead where it has been found (Minckley, pers. comm., 1978); also found at the mouth of the Paria River, Grand Canyon (Suttkus, et al., 1976), probably the result of AGF's efforts to introduce the woundfin from the Virgin River
rel. abundance: rare and threatened
date of intro.: around 1935, after creation of Lake Mead (Minckley, pers. comm., 1978)
museum coll.: Tulane University

24. Virgin River spinedace (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
mouth of Paria River	1B	688.4	1	R. Suttkus et al.	7/19/ 1972	SMMS	TU		126
bait box on Lake Mead	2	342.2-276.0		A. Jonez	Feb. 1951			bait	88

25. Moapa dace
Moapa coriacea

classification: native to Moapa River drainage, southern Nevada (Minckley, 1969); on Nevada's Classification of Wildlife list, March 6, 1978
occurrence: Moapa River, the lower portion of which has been inundated by Lake Mead (Minckley, pers. comm., 1978); populations from Warm Springs area of northern Clark County (La Rivers, 1962)
rel. abundance: rare in Lake Mead (Minckley, 1965)
date of intro.: around 1935, after the creation of Lake Mead (Minckley, pers. comm., 1978)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Moapa River	2	368.0	r						95

26. golden shiner
Notomigonus chrysoleucus

classification: non-native, bait fish
occurrence: various places throughout the mainstem (Minckley, 1973)
rel. abundance: achieves great abundance in areas where it has become established (Minckley, 1969)
date of intro.: first collected from Colorado River in 1953 (Shapovalov and Dill, 1959)
museum coll.: ASU, GCNP, TU, CAS

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Kanab Creek	1B	546.1	1	R. Suttkus et al.	7/9/ 1975	SMMS	TU		126
Lake Mead	1	409.7-342.2	2	NFG	7/51-6/54	GN,Sn, P,Ag,Tr		2% of total fish catch	68

26. golden shiner (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Rogers Spring, Overton Arm	2	368.0		J.E. Deacon R. Mauser G. Austin	3/14/ 1963		ASU		15
Rogers Spring	2	368.0			12/8/ 1963		ASU		15
Rogers Spring	2	368.0		J.E. Deacon B. Zanoranec	12/7/ 1963		ASU		15
Rogers Spring	2	368.0		W.L. Minckley J.E. Deacon B. Zanoranec	12/ 7&8/ 1963		ASU		15
Topock Gorge region	3B	276.0-223.9							99
Parker region	4A	192.3-177.9							99
Deer Island Lake	4B	172.0-169.1	1	M.K. Saiki et al.	Jan. 1975	EF			110
Lower Colo. River	4C	133.8-49.2							99
Intake Store, Yuma	4C	121.4		W.A. Evans	7/5/ 1950			bait	88
Lower Colo. River	5B	43.2-22.1							99

27. red shiner
Notropis lutrensis

classification: non-native, bait fish
occurrence: various places throughout the mainstem (Minckley, 1973)
rel. abundance: achieves great abundance in areas where it has become established (Minckley, 1969)
date of intro.: first collected from Colorado River in 1953 (Shapovalov and Dill, 1959)
museum coll.: ASU, GCNP, TU, CAS

27. red shiner (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Glen Canyon to Lees Ferry	1A	703.8-688.6		AGF	Dec. 1963	P			123
Old River Mile 194.5	1B	484.1	5	R. Suttkus et al.	8/16/1971	SMMS	TU		126
Old River Mile 212	1B	476.1	1	R. Suttkus et al.	8/16/1971	SMMS	TU		126
Spencer Creek	2	444.1		R. Suttkus et al.	8/5/75 6/6/76	SMMS	TU		126
Spencer Creek	2	444.1	6	J. Deacon J. Baker	3/29, 4/24, 5/23/1976	Sn	UNLV		34
Surprise Canyon	2	441.7	94	J. Deacon J. Baker	"	Sn	UNLV		34
Old River Mile 253	2	435.6	9	R. Major	7/23/1962		ASU		15
Old River Mile 255	2	433.6	1	J. Deacon J. Baker	3/4/& 10/1976	EF	UNLV		34
Old River Mile 256	2	432.6	2	J. Deacon J. Baker	3/4/& 10/1976	EF	UNLV		34
Pierce Landing	2	409.7		R. Suttkus et al.	8/6/1978	SMMS	TU		126
Scorpion Island	2	409.1		R. Suttkus et al.	8/5/1978	SMMS	TU		126
Lower Moapa River	2	368.0	20	J. Deacon J. Bradley	1964	EF	UNLV		34
Lower Moapa River	2	368.0	10	J. Deacon J. Bradley	1965	EF	UNLV		34
Lower Moapa River	2	368.0	196	J. Deacon J. Bradley	1966	EF	UNLV		34
Lower Moapa River	2	368.0	74	J. Deacon J. Bradley	1967	EF	UNLV		34
Lower Moapa River	2	368.0	750	J. Deacon J. Bradley	1964-1967	EF	UNLV		34
Lower Moapa River	2	368.0		J. Deacon	3/14/1964		ASU		15

27. red shiner (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Overton Game Refuge	2	368.0			11/3/ 1963		ASU		15
Roger Spring outflow,L. Mead	2	368.0		J. Deacon	7/21/ 1966		ASU		15
Lake Mohave	3A	342.2-278.0	r	NFG	1978				92
Lower Colo. River	3A	342.2-276.0							99
1 mile north of Cal./Nev. state line	3B	258.5		J. Deacon N. Glover	3/12 1961		ASU		15
½ mile south of Cal./Nev. state line	3B	257.0		J. Deacon N. Glover	3/12/ 1966		ASU		15
Lower Colo. River	3B	276.0-223.9							99
Lower Colo. River	3C	223.9-192.3							99
Lower Colo. River	4A	192.3-177.9							99
Lower Colo. River	4B	177.9-133.8							99
Deer Island Lake	4B	176.0-169.1		M.K. Saiki	10/73-8/75	EF,Sn, GN			110
Lower Colo. River	4B	157.5		LCRBR lab	6/19/ 1974		ASU		15
Lower Colo. River	4B	154.2		LCRBR lab	7/10/ 1974		ASU		15
Lower Colo. River	4B	148.7		LCRBR lab	6/21/ 1974		ASU		15
Lower Colo. River	4C	133.8-49.2							99
Ehrenberg	4C	121.3			1953		CAS	reared in fish farms	65
Lower Colo. River	5A	49.2 43.2							99
Lower Colo. River	5B	43.2-22.1							99

27. red shiner (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Yuma Drainage Canal,Jct. Rt. 95 & Co. Rd 13	5B	24.0		E. McClendon	11/28/ 1965		ASU		15
Lower Colo. River	5C	22.1-0							99
Morelos Dam	5C	22.1		E. McClendon D. Williams	3/19/ 1966		ASU		15
Lower Colo. River	5C	20.8		LCRBR lab	3/22/ 1974		ASU		15
Lower Colo. River	5C	17.7		LCRBR lab	8/18/ 1974		ASU		15
East Main Canal	5C	16.7		LCRBR lab	8/19/ 1974		ASU		15
East Main Canal	5C	15.1		LCRBR lab	8/13/ 1974		ASU		15
Lower Colo. River	5C	11.7		LCRBR lab	8/8/ 1974		ASU		15
Lower Colo. River	5C	5.9		LCRBR lab	8/12/ 1974		ASU		15
2 miles s. of Gadsden, Az.	5C	4.1	149	K. Norris A. Allanson	1/18/ 1953		CAS		65
2 mi. n. of San Luis,Mex.	5C	2.0	9	K. Norris A. Allanson	1/18/ 1953		CAS		65
Lower Colo. River	5C	1.9		LCRBR lab	8/18/ 1974		ASU		15

28. fathead minnow
Pimephales promelas

classification: non-native, bait fish
occurrence: Grand Canyon area (Minckley and Blinn, 1975)
rel. abundance: most abundant exotic in Grand Canyon (Minckley and Blinn, 1975)
date of intro.: 1950's (Minckley, 1969)
museum coll.: UU, ASU, TU, UCFRU

28. fathead minnow (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Aztec Canyon, Glen Canyon		757.2	27	G.R. Smith G. Musser D. McDonald	6/30-8/8/1958	Rt	UU		119
Rock Canyon Glen Canyon		744.2	90	G.R. Smith G. Musser D. McDonald	6/30-8/8/1958	Sn	UU		119
West Canyon Creek		739.4			6/30-8/8/1958	Ob	UU	unknown number observed	119
No Name Canyon		733.0	90	G.R. Smith G. Musser D. McDonald	6/30-8/8/1958	HS	UU		119
No Name Canyon		733.0	15	G.R. Smith G. Musser D. McDonald	6/30-8/8/1958	Rt	UU		119
Kane Creek		729.2	5	G.R. Smith G. Musser D. McDonald	6/30-8/8/1958	HS	UU		119
Padre Creek		728.5	3	G.R. Smith G. Musser D. McDonald	6/30-8/8/1958	HS	UU		119
Warm Creek		716.4	5	G.R. Smith G. Musser D. McDonald	6/30-8/8/1958	HS	UU		119
Glen Canyon to Lees Ferry	1A	703.8-688.6	8	AGF	Dec. 1963	P	UCFRU		123
Paria River	1B	688.4		W. & D. Knoch	5/24/1952				90
Marble and Grand Canyons	1B	686.6-409.5	r	C.B. Stalnaker P.B. Holden	1970-1972	Sn	UCFRU	area not studied intensively	63
Old River Mile 44	1B	660.2		R. Suttkus et al.	1970-1976	SMMS Ob	TU		126
Little Colo. River	1B	627.4		R.R. Miller	8&9/1960				92
Little Colo. River	1B	627.4	c	R. Suttkus et al.	8&9/1960	SMMS	TU		126

28. fathead minnow (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Little Colo. River	1B	627.4		R. Suttkus et al.	1970-1976	SMMS Ob	TU		126
Little Colo. River	1B	627.4	1	C.O. Minckley D.W. Blinn	7-8/1975	Sn	NAU		93
Carbon Creek	1B	624.3	34	C.O. Minckley D.W. Blinn	7-8/1975	Sn	NAU		93
Lava Creek	1B	623.5	1	C.O. Minckley D.W. Blinn	7-8/1975	Sn	NAU		93
Bright Angel Creek	1B	601.3		R.R. Miller et al.	8-9/1960				92
Bright Angel Creek	1B	601.3		R.R.,G.H., F.L. Miller	8/23/1960		ASU		15
Bright Angel Creek	1B	601.3	34	R.R. Miller	5/21/1966				90
Pipe Creek	1B	600.2	2	C.O. Minckley D.W. Blinn	7-8/1975	Sn	NAU		93
Crystal Creek	1B	591.0	1	C.O. Minckley D.W. Blinn	7-8/1975	Sn	NAU		93
Royal Arch Creek	1B	572.8	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Elves Chasm	1B	572.8		R. Suttkus et al.	1970-1976	SMMS	TU		126
Deer Creek	1B	553.2		R. Suttkus et al.	1970-1976	Ob	TU		126
Deer Creek	1B	553.2	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Kanab Creek	1B	546.1	2	C.O. Minckley D.W. Blinn	7-8/1975	Sn	NAU		93
Kanab Creek	1B	546.1	1	P.B. Holden	1971	Sn,EF	UCFRU		60
Parashont Wash	1B	491.5	7	C.O. Minckley D.W. Blinn	7-8/1975	Sn	NAU		93
Spencer Creek	2	444.1	8	R.R. Miller	10/22/1954				90
Spencer Creek	2	444.1		R. Suttkus et al.	1970-1976	Ob	TU		126
Spencer Creek	2	444.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126

28. fathead minnow (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Spencer Canyon	2	444.1	1	J. Deacon J. Baker	3/7&29/ 4/24/ 5/23/76	Sn	UNLV		34
Surprise Canyon	2	441.7	7	J. Deacon J. Baker	3/7&29/ 4/24/ 5/23/76	Sn	UNLV		34
Lower Moapa River	2	368.0	0	J. Deacon G. Bradley	1964	TS	UNLV		33
Lower Moapa River	2	368.0	0		1965	TS	UNLV		33
Lower Moapa River	2	368.0	0		1966	TS	UNLV		33
Lower Moapa River	2	368.0	0		1967	TS	UNLV		33
Lower Moapa River	2	368.0	0		1964-1967	TS	UNLV	yearly mean	33
Lower Colo. River	3B	276.0-223.9							99
Lower Colo. River	3C	223.9-192.3							99
Lower Colo. River	4C	133.8-49.2							99
Lower Colo. River	5A	49.2-43.2							99
Lower Colo. River	5B	43.2-22.1							99
Williams Bait Shop, Yuma	5B	30.0		W. Evens P. Douglas	1950				88
main outlet drain, Yuma	5B	24.0			1973				132
Limitrophe region	5C	22.1-0							99

29. woundfin - silver dace
Plagopterus argentissimus

classification: native, non-game; listed as endangered in Federal Register October 30, 1970; on Arizona's Threatened and Unique Species list, and Nevada's Classification of Wildlife list, October 21, 1978 and March 6, 1978, respectively

occurrence: must have occurred throughout the lower Colorado River basin in larger streams in the 1800's' present range greatly reduced - now occurs in the lower Virgin River mainstem (Minckley, 1973). Reintroduced in lower Paria River by Arizona Game and Fish in 1972 (AGF, 1977).

rel. abundance: rare (Minckley, 1973)

museum coll.: USNM, UNLV

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Paria River	1B	688.4	6.50		Feb. 72	stocking		specimen	13
Virgin River drainage, AZ	2	368.0						distribution as of 1972	130
Lake Mead boat dock	2	347.5		R.R. Miller H.E. Winn	6/16 1950			used as bait fish	88
Lower Colo. River	5B	43.2-22.1							99
mouth of Gila River near Yuma	5B	34.2	few	C.H. Gilbert N.B. Scofield	late Apr. early May 1890		USNM	a few specimens procured	86

30. Colorado River squawfish - Colorado squawfish, Colorado salmon, white salmon
Ptychocheilus lucius

classification: native, non-game; listed as endangered in Federal Register, March 11, 1967; on Arizona's Threatened and Unique Species list, California's "At the Crossroads" report, and Nevada's Classification of Wildlife lists, October 21, 1978, January 1, 1972 and March 6, 1978, respectively

occurrence: once prevalent throughout the Colorado mainstem (Holden, 1974); now considered extirpated from the Colorado River in Arizona (USFWS, 1978); still occurs above Lake Powell in the Green River (Minckley, 1969). Hatchery pop. at Willow Beach. Last specimen known recorded at mouth of Havasu Creek, Grand Canyon (ASU Museum Register, 1972).

rel. abundance: persisted until the late 1940's (Dill, 1944); once common (Holden et al., 1974); now extirpated from lower mainstem (USFWS, 1978)

museum coll.: ASU, USNM, UAAD, SU

30. Colorado River squawfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Colorado River			limited numbers					in lower stretches of river	141
Colo. River				A. Schott	ca 1856				50
entire Colorado River			c	D.S. Jordan	1891			caught by hook & line til 1930's	61
entire Colo. River			c	D.S. Jordan B.W. Evermann	1896				61
Colo. River drainage				M.M. Ellis	ca. 1914				48
Glen Canyon Dam to Lees Ferry	1A	703.8-688.6			1962-1966				100
Lees Ferry	1B	688.6			1965		ASU		15
Grand Canyon	1B	687.7-412.3			1960's			still occurred then (C.H. Lowe)	79
Grand Canyon	1B	687.7-412.3	1				ASU		15
Grand Canyon	1B	687.7-412.3	0	R.R. Miller	1944			expected; not seen	86
1 mi. from Lees Ferry	1B	687.6	1	R.R. Miller	6/8/1934				90
Lake Mead area	2	412.3-342.2			prior to 1935	Ag		before formation of Lake Mead	68
Lake Mead	2	412.3-342.2	0	NFG	1951-1954				68
below Hoover Dam	3A	342.2			ca. 1940's	Ob			102
Lake Mohave	3A	342.2-276.0	0	A. Jonez R. Sumner	7/50-6/54	CC, GN,Ob		considered rare	68
Lake Mohave	3A	342.2-276.0	r		1951				8
Willow Beach	3A	330.4	1	G. Allen	1952			considered rare	68
Willow Beach	3A	330.4	1		1962			wt.-17 lbs	4

30. Colorado River squawfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
15 miles below Hoover Dam	3A	327.2	6		1949	archaeological tests	UAAD	archaeological remains	89
Davis Dam	3B	276.0	several caught	A. Jonez R. Sumner	7/50-6/54	Ag		considered rare	68
1 mi. below Davis Dam	3B	275.0	1	J. Litchfield	May 1952	Ag		38" 20 lbs	68
Lake Havasu	3C	276.0-192.3	r		1938			present in 1938(completion Parker Dam)	19
Needles to Yuma	3B-5B	244.4-30.8	0		1942			considered a rarity	35
Topock, Az.	3C	233.9	1		1910	Ag	SU		38
Lower Colo. River	3B	276.0-223.9							99
Lower Colo. River	3C	223.9-192.3							99
Lower Colo. River	4C	133.8-49.2							99
Ehrenberg,Az.	4C	121.0		W.P. Blake					20
Cibola, Az.	4C	ca 100		J. Grinnell		Ag	SU		52
Calif. side; opp. Cibola	4C	ca 100	1	L. Spier	ca. 1933	Ag			121
above Laguna Dam	5A	ca 43.2		Mohave Indians	prior 1909	Nets Tr			122
below Laguna Dam	5B	ca 43.2		J. Grinnell	1910	Ob	SU		52
mainstem of Colorado and Gila Rivers	5B	34.2			1977			considered extirpated from lower river and tributaries	139
Yuma area	5B	30.8-28.6	several	C.H. Gilbert	1890	SN Sn	USNM		49
Yuma area	5B	30.8-28.6		E.G. Mearns	1892-1894		USNM		120

30. Colorado River squawfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Yuma area	5B	30.8-28.6		C.H. Gilbert N.B. Scofield	1890				49
Yuma	5B	30.8-28.6	a	farmers	1911	pitch-fork		used as fertilizer	94
Limitrophe region	5C	22.1-0							99

31. speckled dace
Rhinichthys osculus

classification: native, forage and bait fish (currently not legal bait fish in Arizona)
occurrence: a creek fish, found at the confluence sites in the tributaries of the mainstem Colorado in the Grand Canyon area, the lower river apparently inhospitable (Minckley, 1973)
rel. abundance: abundant at the mouths of tributaries (Holden and Stalnaker, 1973)
museum coll.: UU, UCFRU, CAS, ASU, TU, USNM

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Hidden Passage, Glen Canyon		764.7	6	G.R. Smith G. Musser D.B. McDonald	6/30-8/8/1958	HS	UU		119
Aztec Canyon and Glen Canyon		757.2	24	G.R. Smith G. Musser D.B. McDonald	6/30-8/8/1958	Rt	UU		119
No Name Canyon, Glen Canyon		757.2	1	G.R. Smith G. Musser D.B. McDonald	6/30-8/8/1958	Rt	UU		119
Rock Creek		744.2	5	G.R. Smith G. Musser D.B. McDonald	6/30-8/8/1958	Sn	UU		119
West Canyon Creek		739.4		G.R. Smith G. Musser D.B. McDonald	6/30-8/8/1958	Ob	UU	unknown number observed	119
Padre Creek		728.5	5	G.R. Smith G. Musser D.B. McDonald	6/30-8/8/1958	HS	UU		119

31. speckled dace (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Bright Angel Creek	1B	601.3	43	C.O. Minckley D. W. Blinn	7-8/ 1975	Sn	NAU		93
Garden Creek	1B	600.2	1		May 1932			re-identified by W. Minckley	82
mouth of Garden Creek	1B	600.2		F. Davis	7/30/ 1932		ASU		15
mouth of Garden Creek	1B	600.2	63	L. Davis	7/30/ 1932		USNM		86
Garden Creek	1B	600.2	75		1933		CAS	re-identified by W. Minckley	82
Pipe Creek	1B	600.2	55	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Hermit Creek	1B	594.4	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Hermit Creek	1B	594.4	48	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Travertine Creek	1B	593.8	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Boucher Creek	1B	592.7	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Old River Mile 112	1B	592.2	8	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Crystal Creek	1B	591.0	69	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Shinumo Creek	1B	580.7	84	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Shinumo Creek	1B	580.7		C.O. Minckley R.R. Miller	7/13/ 1975		ASU		15
Elves Chasm	1B	572.8	77	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Blacktail Canyon	1B	569.2	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Stone Creek	1B	557.7	c	R. Suttkus et al.	1970-1976	SMMS	TU		126

31. speckled dace (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Stone Creek	1B	557.7	14	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Deer Creek	1B	553.2	19	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Kanab Creek	1B	546.1	30	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Havasu Creek	1B	532.95	10	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Havasupai below Moony Falls	1B	532.95	1	R.R. Miller	9-3/ 1943				90
Parashont Wash	1B	491.5	8	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
Diamond Creek	1B	464.4	35	C.O. Minckley D.W. Blinn	7-8/ 1975	Sn	NAU		93
1 mi. above Spencer Creek	2	445.1	11	R.R. Miller	10-22/ 1955				90
1000 yds above Spencer Creek	2	444.7		R.R. Miller	10-22/ 1955				90
Spencer Creek	2	444.1	41	J. Deacon J. Baker	3-29/, 4-24/. 5/23/76		UNLV		34
Old River Mile 260	2	428.6	2	J.Deacon J. Baker	10-26/, 4-24/, 5/23/76		UNLV		34

32. redside shiner - Bonneville redside shiner
Richardsonius balteatus

classification: non-native bait fish
occurrence: found in bait tanks along lower Colorado River below Lake Mead
rel. abundance: not established
date of intro.: 1950 from bait tanks (Miller, 1952)

32. redside shiner (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Shorty's Bait Shop, Topock	3C	233.9		R.R. Miller and party	4/7/ 1950			bait fish	88
Shorty's Bait Shop, Topock	3C	233.9		R.D. Beland	Dec. 1950			bait fish	88
Kinders Camp	4A	182.0		P. Douglas	6/21 1950			bait fish	88

33. Utah sucker
Catostomus ardens

classification: non-native, bait fish
occurrence: bait boxes at Lakes Mead and Havasu
rel. abundance: not established
date of intro.: 1951 from bait tanks
museum coll.: ASU

(Miller, 1952)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mead	2	412.3-342.2	1	A. Jonez	Feb. 1951			taken from bait box	88
Cottonwood Basin,L. Mohave	3A	298.3		W.L. Minckley et al.	4/5/ 1975		ASU		15
Lake Mohave	3A	296.0		W.L. Minckley E. Gustafson	4/6/ 1975		ASU		15
Havasu Springs Rsrt	3B	276.0		R. Beland	4/10/ 1951				88

34. white sucker - western white sucker
Catostomus commersoni

classification: non-native, bait fish
occurrence: lower Colorado River, below Lake Mead
rel. abundance: not established
date of intro.: first recorded in 1950 from Kinder's Camp, California

(Miller, 1952)

35. flannelmouth sucker
Catostomus latipinnis

classification: native, non-game
occurrence: once located throughout the Colorado basin, now occurs mainly in the Grand Canyon and Lake Mead (Minckley, 1969)
rel. abundance: common in most places of the Grand Canyon (Holden and Stalnaker, 1975); uncertain in Lake Mead (Nevada Fish and Game, 1978)
museum coll.: UNLV, UU, ASU, TU, GCNP, UCFRU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
No Name Canyon		762.4	1	G. Smith G. Musser D. McDonald	6/30-8/8/1958	Rt	UU		119
Aztec Canyon		757.2	5	G. Smith G. Musser D. McDonald	6/30-8/8/1958	Rt	UU		119
Glen Canyon Dam area	1A	703.8	c	P.B. Holden C.B. Stalnaker	1967& 1970	GN,SN, EF,Ag	UCFRU	young & adult fish present	63
Glen Canyon Dam tailwaters	1A	703.8	5	J. Stone	Dec. 1963	GN			123
Glen Canyon Dam tailwaters	1A	703.8	9	J. Stone	Jan. 1964	GN			123
Glen Canyon Dam tailwaters	1A	703.8	4	J. Stone	May 1964	GN			123
Glen Canyon Dam tailwaters	1A	703.8	28	J. Stone	Jan. 1964	GN			123
Glen Canyon Dam tailwaters	1A	703.8	31	J. Stone	7/71-6/30/72	GN			124
100 yds below Glen Cyn Dam	1A	703.7	a	P.B. Holden	1970	GN			60
confluence of Paria & Colo.	1B	688.4		AGF	5/25/1976		ASU		15
confluence of Paria & Colo.	1B	688.4	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
confluence of Paria & Colo.	1B	688.4	7	R.R. Miller	5/24/1952				90

35. flannelmouth sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Grand Canyon	1B	687.7-412.3	c	P.B. Holden C.B. Stalnaker	1970-1972	GN,Sn, EF,Ag	UCFRU	young & adult fish present	63
Grand Canyon	1B	687.7-412.3	0	R.R. Miller	1944			expected; not seen	86
Marble Canyon	1B	684.2	c		1970-1972	GN,Sn, EF,Ag	UCFRU		63
mainstem	1B	647.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
mainstem	1B	644.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
mainstem	1B	638.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Little Colorado	1B	627.4	1	C.O. Minckley D.W. Blinn	7&8/1975	SN	NAU		93
Little Colorado	1B	627.4	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
mainstem	1B	622.8	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
mainstem	1B	617.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Pipe Creek	1B	604.9	2	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Clear Creek	1B	604.9	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Bright Angel Creek	1B	601.3	4	R.R. Miller	8/23/1960				90
Bright Angel Creek	1B	601.3	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
mainstem	1B	601.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Crystal Creek	1B	591.0	4	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Crystal Creek	1B	591.0	c	R. Suttkus et al.	1970-1976	SMMS	TU		126

35. flannelmouth sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Shinumo Creek	1B	580.7	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Shinumo Creek	1B	580.7	21	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
Shinumo Creek	1B	580.7	8	C.O. Minckley R.R. Miller	7/13/ 1975		ASU		15
Elves Chasm	1B	572.8	3	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
Royal Arch Creek	1B	572.8	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Tapeats Creek	1B	555.8	3	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
Deer Creek	1B	553.2	5	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
Deer Creek	1B	553.2	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Kanab Creek	1B	546.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Kanab Creek	1B	546.1		C.O. Minckley J.E. Bartuszek	8/17/ 1975		ASU		15
Kanab Creek	1B	546.1	17	C.O. Minckley D. W. Blinn	7&8/ 1975	Sm	NAU		93
Matkatamiba Creek	1B	541.8	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Havasu Creek	1B	532.95	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Havasu Creek	1B	532.95	6	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
National Canyon Creek	1B	523.3	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Parashont Creek	1B	491.5	13	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
mainstem	1B	484.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
mainstem	1B	478.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126

35. flannelmouth sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
mainstem	1B	476.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Diamond Creek	1B	464.4	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
mainstem	1B	463.6	1	J. Deacon J. Baker et al.	3/7&29/ 4/24/ 5/23		UNLV		34
100 yds above Spencer Creek	2	444.2		R.R. Miller	10/25/ 1955				90
Spencer Creek	2	444.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Surprise Canyon	2	441.7	2		3/7&29/ 4/24/ 5/23/		UNLV		34
upstream from Lake Mead	2	342.2-409.7			1973				97
Lake Mead	2	342.2-409.7	1	J. Watson	1938				103
Above Hoover Dam	2	342.2	c		1964				92
downstream from L. Mead	3A	342.2	less than 5						97
Lake Mohave	3A	276.0-342.2	1	A. Jonez	1/24/ 1954				68
Lake Mohave	3A	276.0-342.2	r	A. Jonez R. Sumner	7/50& 6/54	Ob GN			68
Eldorado Canyon	3A	316.0			1/12/ 1954			R.R. Miller identified	68
Mohave Wash	3B	231.9	1	R.R. Miller	10/25/55				90
Lower Colo. River	4C	133.8-49.2							99
Lower Colo. River	5A	49.2-43.2							99
Lower Colo. River	5B	43.2 22.1							99
Imperial Co.	[?]				1971		ASU		15
Near Gila Input	5B				1972		ASU		15

36. Gila mountain sucker - Gila sucker, desert sucker
Catostomus clarki

classification: native ; non-game fish
occurrence: recorded in the Paria River (Miller, 1974) and White River basin - little known of its overall ecology but scientifically documents the connection of the White River with the Colorado (Minckley, 1969)
rel. abundance: rare in mainstem (see references in table below)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Paria River 1 mi. above Lees Ferry	1B	688.4	5	R.R. Miller	10/8/ 1934				90

37. bluehead sucker - bluehead mountain sucker
Catostomus discobolus

classification: native , non-game fish
occurrence: Marble Canyon, Grand Canyon (Holden and Stalnaker, 1975); tributaries near Overton Arm, Lake Mead (ASU Museum Reg.)
rel. abundance: common in Marble and Grand Canyons (Holden and Stalnaker, 1975)
museum coll.: UU, TU, UCFRU, ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Aztec Canyon		757.2	8	G. Smith G. Musser D. McDonald	6/30- 8/8/ 1958	Rt	UU		119
West Canyon Creek		739.4		G. Smith G. Musser D. McDonald	6/30- 8/8/ 1958	Ob	UU	unknown number observed	119
Padre Creek		728.5	1	G. Smith G. Musser D. McDonald	6/30- 8/8/ 1958	HS	UU		119
Warm Creek		416.4	24	G. Smith G. Musser D. McDonald	6/30- 8/8/ 1958	HS	UU		119

37. bluehead sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
tailwaters of Glen Canyon Dam	1A	703.8		AGF	winter 1966		ASU		15
Paria River ¼ mi. above Lees Ferry	1B	688.4	1	R.R. Miller	6/8/ 1934				90
Paria River	1B	688.4	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
1 mi. from Lees Ferry	1B	687.6	1	R.R. Miller	8/6/ 1934				90
Grand Canyon	1B	687.7-412.3	c	P.B. Holden C.B. Stalnaker	1970-1972	GN,Sn, EF,Ag	UCFRU		63
Tatahatso Wash	1B	651.4	8	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
Old River Mile 41	1B	647.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Old River Mile 44	1B	644.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Old River Mile 50	1B	638.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Nanknuweap Creek	1B	636.4	6	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
Little Colo. River	1B	627.4	c	P.B. Holden	1970-1972	Sn EF	UCFRU		60
Little Colo. River	1B	627.4	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Carbon Creek	1B	624.3	4	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn	NAU		93
Lava Creek	1B	623.45	4	C.O. Minckley D.W. Blinn	7&8/ 1975	Sn	NAU		93
Old River Mile 71	1B	617.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
mainstem	1B	601.6	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
between Phantom Ranch & Bright Angel Creek	1B	ca 601.3	2	V. Veatch	7/1/ 1937		USNM		86

37. bluehead sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
between Phantom Ranch & Br. Angel Cr.	1B	ca 601.3	4	L.E. Womac	8/21/1949		ASU	larvae	15
between Phantom Ranch & Br. Angel Cr.	1B	ca 601.3	7	L.E. Womac	8/21/1949		ASU	R.R. Miller identified: young-juveniles	15
Br. Angel Cr.	1B	601.3	1	E. McKee	6/23/37		USNM		86
Br. Angel Cr.	1B	601.3		J. Rafden	1/17/44		ASU		15
Bright Angel Creek	1B	601.3		R.R. Miller et al.	8/23/1960		ASU		15
Bright Angel Creek	1B	601.3	c	R. Suttkus	1970-1976	SMMS	TU		126
Pipe Creek	1B	600.2	3	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Hermit Creek	1B	594.35	1	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Crystal Creek	1B	591.0	5	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Crystal Creek	1B	591.0	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Shinumo Creek	1B	580.7		C.O. Minckley R.R. Miller	1/13/1965		ASU		15
Shinumo Creek	1B	580.7	c	P.B. Holden	1970-1972	EF Sn			60
Shinumo Creek	1B	580.7	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Shinumo Creek	1B	580.7	27	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Old River Mile 112	1B	576.6	1	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Elves Chasm	1B	572.8	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Elves Chasm	1B	572.8	5	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Tapeats Creek	1B	555.8	1	R. Suttkus et al.	1970-1976	SMMS	TU		126

37. bluehead sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Deer Creek	1B	553.2	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Deer Creek	1B	553.2	5	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Kanab Creek	1B	546.1	c	P.B. Holden	1970-1972	Sn EF			60
Kanab Creek	1B	546.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Kanab Creek	1B	546.1		C.O. Minckley J.B. Bartuszek	7/17/1975		ASU		15
Havasu Creek	1B	523.95	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
National Canyon Creek	1B	523.3	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Parashont Wash	1B	505.7	37	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Grand Canyon Coconino Co.	1B	499.7		C.O. Minckley R.R. Miller	7/13/1975		ASU		15
Old River Mile 194.5	1B	484.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Diamond Creek	1B	464.4	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Spencer Creek	2	444.1	c	R. Suttkus et al.	1970-1976	SMMS	TU		126
Surprise Canyon	2	441.7	1	J. Deacon J. Baker	3/2&29, 4/24, 5/23/76	Sn	UNLV		34
Old River Mile 253	2	435.6	1	J. Deacon J. Baker	10/26, 4/24/ 3/29/76		UNLV		34
Lake Mead	2	342.2-412.3		J. Deacon	6/26/1963		ASU		15
Lake Mead bait box	2	[?]		A. Jonez	Feb. 1951			used as bait	88
Rogers Spring	2	368.0		J. Deacon C. Bradley Caldwell	12/23/1960		ASU		15

37. bluehead sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Rogers Spring	2	368.0			12/8/ 1963		ASU		15
Lake Mead boat dock	2	ca 350		O.L. Wallis	12/31/ 1938				88
Shorty's Boat Shop, Topock	3C	233.9		R.D. Beland	Dec. 1950				88
Murphy's Wind-Mill Camp	4C	ca 90		R.D. Beland	2/3/ 1951				88

38. mountain sucker - Bonneville mountain sucker
Catostomus platyrhynchus

classification: non-native, bait fish
occurrence: one specimen recorded from Lake Mead, other specimens from bait shops below Lake Mead
rel. abundance: not established
museum coll.: Lake Mead Recreation Museum

(Miller, 1952)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mead	2	[?]	1	J. Weston	9/8/38			bait	103
Havasu Spring Rsrt	3C	276.0	c	R.D. Beland	4/10/ 1951			bait	88
Murphy's Wind-mill Camp	4C	ca 90		R.D. Beland	2/3/ 1951			bait	88

39. Rio Grande sucker - Rio Grande mountain sucker
Catostomus plebius

classification: non-native, bait fish
occurrence: one specimen from Intake Store, California, lower Colorado River, below Lake Mead
rel. abundance: not established
date of intro.: 1950 as bait fish

(Miller, 1952)

39. Rio Grande sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Intake Store, Cal.	4C	121.4	1	W. Evans	7/5/ 1950			yearling, used as bait	88

40. dusky mountain sucker
Catostomus sp.

classification: non-native, bait fish
occurrence: was recorded from Lake Mohave (Jonez and Sumner, 1954); also recorded at bait-shops below Lake Mead (Miller, 1952)
rel. abundance: rare in Lake Mohave (Jonez and Sumner, 1954)
date of intro.: first recorded in 1950 as bait fish (Miller, 1952)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mohave	3A	324.0	10	A. Jonez R. Sumner	Spring 1951	GN		considered rare (NFG)	68
Murphy's Windmill Camp	4C	ca 90	1	R.D. Beland	2/3/ 1951			bait fish	88

41. humpback sucker - razorback sucker
Xyrauchen texanus

classification: native, non-game fish; proposed as threatened in Federal Register, April 24, 1978; on Arizona's Threatened and Unique Species list, California's "At the Crossroads" report, and Nevada's Classification of Wildlife list, October 21, 1978, January 1, 1972, and March 6, 1978, respectively
occurrence: this unique species once occurred throughout mainstem - range now greatly reduced, it occurs in Lakes Mohave, Mead, and upstream (Minckley, 1969)
rel. abundance: uncommon in Lake Mead; still common in Lake Mohave (Nevada Fish and Game, 1978); abundant before 1915 (Miller, 1955). One specimen collected from Paria River, June 1978 (pers. comm. Chuck Minckley)
museum coll.: UU
ASU
CAS
UAAD
SU
USNM

41. humpback sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Rocky Creek, Glen Canyon		444.2	1	G. Smith G. Musser D. McDonald			UU		119
Colo. River				C.C. Abbott	1860				1
Colo. River & tributaries				D.S. Jordan B.W. Evermann	1891				61
Colo. River & tributaries				D.S. Jordan B.W. Evermann	1896				61
Colo. River & tributaries					1944				35
Grand Canyon	1B	687.7-412.3			1965				79
Grand Canyon	1B	687.7-412.3		R.R. Miller	1944		USNM		86
Bright Angel Cr.	1B	601.3		R. Sawyer	5/17/1944		ASU		15
Lake Mead	2	412.3-342.2	a		1951			"appears to be doing well"	147
Lake Mead	2	412.3-342.2	a	NFG	7/51-6/54	GN,Ag, Tr,Sn,P		"primarily near river mouth"	68
Echo Bay, Overton Arm	2	368.0	1	Romero Groom Johanson	11/2/1973	Ob			134
South Cove	2	393.5	2	M. Johnson	5/15/70		ASU		15
South Cove	2	393.5	2	Romero Groom Johanson	11/1/1973	Ob			134
below Hoover Dam	3A	342.2			1942			collected or observed	103
below Hoover Dam	3A	342.2		H.G. Winn R.R. Miller	ca. 1954			larval razorbacks	60
1 mi. south Hoover Dam	3A	341.2	200	LCRBR lab	Mar. 1975	Ob TN		spawned near hot spring	54
Cottonwood Basin	3A	362.2	91	LCRBR lab	Apr. 1975	TN			54
Lake Mohave	3A	342.2-276.0			1951			"less than Lake Mead"	147

41. humpback sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mohave	3A	342.2-276.0	23	A. Jonez R. Sumner	9/14/50 2/12/54	Ob GN CC		considered common in Lake Mohave	68
Lake Mohave	3A	342.2-276.0	c		Sept. 1951				8
Lake Mohave	3A	342.2-276.0	large numbers		1974				61
2 mi. below Hoover Dam	3A	340.0	50	C. Allan	3/28/1974	Ob			73
Willow Beach	3A	330.4		G. Kobetich et al.	7/31/1974		ASU		15
Willow Beach	3A	330.4		G. Kobetich et al.	3/27/1974				15
6.8 miles below Willow Beach	3B	323.6	27		1949		UAAD	Archaeological remains of fish	89
east side of Cottonwood Landing	3A	298.3		W.L. Minckley et al.	Feb. 3-6/1977		ASU		15
Cottonwood Cove	3A	298.3	2	Razorback Recovery Team	3/26/1974			fish at WBNFH	73
Cottonwood Cove	3A	ca 298.3	38	Razorback Recovery Team	3/27/1974	Sn		fish at WBNFH	73
Cottonwood Basin	3A	298.3		W.L. Minckley	11/27/1975		ASU		15
sm. cove on perimeter of Ctnwd Basin-20 mi. no. of David Dam	3A	296.0	91	LCRBR lab	Apr. 1975	TN			54
L. Mohave 2.1-2.4 mi. no. of Davis Dam	3A	278.0		W.L. Minckley et al.	3/19/1966		ASU		15
base of Davis Dam	3A	276.0		R.R. Miller	7/31/1950				90
below Davis Dam	3B	276.0	c	A. Jonez R. Sumner	7/50-6/54		Ag	spawning observed	68

41. humpback sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Needles Boat Landing	3B	245.6	many	P.A. Douglas L. Rossier	Mar. 1950	GN,Ob, Sn		spawning observed	37
Topock, Az.	3C	233.9		J. Grinnell	1910	Sn	SU		52
Topock, Az.	3C	233.9			1968				97
Lake Havasu	3C	223.9-192.3	r		1950				19
Lake Havasu	3C	223.9-192.3	9	P.A. Douglas	Mar. 1950	GN Ob		spawning observed	37
Lake Havasu	3C	223.9-192.3	1	BR, FWS, AGFD, CFG	1972	GN			53
Headgate Rock Dam	4B	177.9	13	W.A. Dill	1942	GN			35
Blythe area	4B	136.5	1	Angler	1974				27
Senator Wash	4C	50.2	7	C. Marshall	11/73	Sn			90
Senator Wash	4C	50.2	2	C. Marshall	2/73	EF			90
Imperial Dam	5A	49.2	1	R.R. Miller	4/15/79				90
near Imperial Dam	5A	ca 49.2		AGF	Mar. 1973				15
Yuma to Laguna Dam	5B	43.2-31.0		Mohave Indian	prior 1909	Tr,long & dip nets			122
200 yds below Laguna Dam	5B	43.1	2	R.R. Miller	4/5/ 1950				90
½ mi. below Laguna Dam	5B	42.7		R.R. Miller	5/21/ 1952				90
Gila River Basin	5B	34.2			before the dams			staple food of Indian tribes	75
confluence of Colo. & Gila Rivers	5B	34.2		J.E. Curry	1880		CAS		45
confluence of Colo. & Gila Rivers	5B	34.2	not common	J.E. Curry	ca. 1881		CAS		78
Yuma	5B	31 - 28	c	C.H. Gilbert N.B. Scofield	1890		USNM		49

41. humpback sucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Yuma	5B	31 - 28		.G. Means	1892-1894	Ag	USNM		120
Yuma to Horseshoe	5B	28		C.H. Gilbert N.B. Scofield	1898				45

42. blue catfish
Ictalurus furcatus

classification: non-native, game fish
occurrence: introduced into Colorado mainstem (Minckley, 1973)
rel. abundance: uncertain
date of intro.: perhaps early 1960's (personal communication, Bill Silvey, Arizona Game and Fish Department)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Parker area	4A	192.3-177.9							99

43. white catfish
Ictalurus catus

classification: non-native, game fish
occurrence: introduced into Colorado mainstem
rel. abundance: uncertain
date of intro.: 1963

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Palo Verde Lagoon	4C	49.2		CFG	1963				151

44. black bullhead
Ictalurus melas

classification: non-native, non-game fish
occurrence: occurs sporadically throughout mainstem (Minckley, 1973)
rel. abundance: rare in Lake Mead, common in Overton Arm area (Nevada Fish and Game, 1978)
date of intro.: 1904 in Lake Mead (Arizona Game and Fish, 1977); also present in Yuma area in 1904 (Miller and Lowe, 1964)
museum coll.: UU, ASU, UNLV, UMMZ

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Aztec Canyon, Glen Canyon		757.2	6	G. Smith G. Musser D. McDonald	1958	Ob Rt	UU		119

44. black bullhead (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Warm Creek Glen Canyon		716.4	1	G. Smith G. Musser D. McDonald	1958	HS	UU		119
Lava Creek	1	673.4	1	C.O. Minckley D. W. Blinn	7&8/ 1975	Sn			93
Lake Mead	2	409.7-342.2	3	Anglers	1976-1977	CC Ag			77
Moapa River	2	368.0	several	A. Jonez R. Sumner	summer 1952	Sn		considered rare in Lake Mead	68
Moapa River	2	368.0	2	J. Deacon G. Bradley	1966-1967	Sn EF	UNLV		33
Moapa River	2	368.0		Vert. Zool. Lab	2/25/ 1967		ASU		15
Boulder Beach	2	361.0	1	R.E. Rees	8/2/ 1937		ASU		147
Lake Mohave	3A	342.0-276.0	2	A. Jonez R. Sumner	7/50-6/54	Sn	UMMZ	R.R. Miller identified	68
Lower Colo. River	3A	342.2-276.0							99
Lake Havasu	3C	223.9-192.3			1954				19
Bill Williams River	3C	192.8		G. Kobetich A. Yenah	1/30/ 1971		ASU		15
Headgate Rock Dam	4B	177.7	1	W.A. Dill	1942	GN			35
Parker	4B	175.5		R.R. Miller	5/20/42				90
Lower Colo. River	4C	133.8-49.2							99
Palo Verde L.	4C			W.A. Dill	1942	GN			35
Lower Colo. River	5B	43.2-22.1							99
Yuma area	5B	ca 30.8			1904			before introduction of channel catfish	72

45. yellow bullhead
Ictalurus natalis

classification: non-native, non-game fish
occurrence: various places along river (Minckley, 1973)
rel. abundance: appears to be limited, though it is the commonest bullhead in lower river (Miller and Lowe, 1964)
date of intro.: 1899 in Lake Havasu area (Beland, 1954)
museum coll.: ASU, SU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River	3A	342.2-276.0							99
Davis Dam	3B	276.0-244.4	"limited"						18
Lake Havasu	3C	223.9-192.3	"a few"		1950-1952			considered rare	19
Lower Colo. River	3B	276.0-223.9							99
Lower Colo. River	3C	223.9-192.3							99
Blankenship Berd	3C	223.0		Zool.414	2/21/1976		ASU		15
Mohave County	3C	193.6		Landye Kepner	12/21/1975		ASU		15
Moolvaya Lake	3C-4A	191.5-177.7	1	G. Kobetich	Mar. 1972			"one of the least abundant in this area"	98
Lower Colo. River	4A	192.3-177.9							99
Yuma County	4A	178.6		LCRBR lab	6/14/74		ASU		15
Deer Island Lake	4A	172.6-169.1	16	M.K. Saiki et al.	Jan. 1975	EF			110
Yuma County	4B	149.2		LCRBR lab	6/21/74		ASU		15
Lower Colo. River	4C	133.8-49.2							99
Yuma County	4C	119.3		LCRBR lab	6/19/74		ASU		15

45. yellow bullhead (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
A-7 Backwater	4C	118.7		M.A. Singer et al.	11/71-10/72	GN EF			115
A-10 Backwater	4C	113.8		M.A. Singer et al.	11/71-10/72	GN EF			115
Martinez Lake	4C	56.3		Zool. 414	2/14/76		ASU		15
Lower Colo. River	5A	49.2-43.2							99
Imperial Reservoir	5A	49.2	49	R.O. Weaver	1969-1970	Rt			148
Imperial Reservoir	5A	49.2	3	R.R. Miller	Mar. 1950				90
Lower Colo. River	5B	43.2-22.1							99
Haughtelen Lake	5B	40 - 30	3	W.A. Dill	1942				35
Yuma County	5B	34.2		LCRBR lab	8/11/74		ASU		15
Lower Colo. River	5C	22.1-0							99
E. Main Canal Yuma County	5C	15.2		LCRBR lab	8/16/1974		ASU		15
Hunters Hole	5C	2.4		LCRBR lab	8/21/1974		ASU		15
Hunters Hole	5C	2.4	23	W.L. Minckley	1974				101
1 mi. above Internat'l Boundary	5C	1.0		E. McClendon	10/20/1967		ASU		15

46. brown bullhead
Ictalurus nebulosus

classification: non-native, non-game fish
occurrence: occurs sporadically throughout the lower Colorado Basin (Minckley, 1964)
rel. abundance: limited, hard to find (Essbach, 1967)
date of intro.: recorded in 1910 in vicinity of Topock, Arizona (Miller and Lowe, 1964)

46. brown bullhead (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River	3A	342.2-276.0							99
Topock, Az.	3C	233.9		J. Grinnell	1910	Sn	SU		121

47. channel catfish
Ictalurus punctatus

classification: non-native, game fish
occurrence: throughout mainstem (see references below)
rel. abundance: abundant in Lakes Mead and Mohave (Nevada Fish and Game, 1978); rare in Grand Canyon (Holden and Stalnaker, 1975)
date of intro.: 1892-1893 into lower river (Miller and Alcorn, 1943)
museum coll.: ASU, UCFRU, TU, USNM, UU, UNLV

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
No Name Canyon, Glen Canyon		762.4	1	G. Smith G. Musser D. McDonald	1958	Rt	UU		119
Aztec Canyon, Glen Canyon		757.2	10	G. Smith G. Musser D. McDonald	1958	Rt Ob	UU		119
Warm Creek, Glen Canyon		716.4	1	G. Smith G. Musser D. McDonald	1958	HS	UU		119
Lower Colo. River					1890's				31
Glen Canyon - Lees Ferry	1A	703.8-688.6	3	AGF	12/63-6/64	GN CC			123
Glen Canyon - Lees Ferry	1A	703.8-688.6	12	AGF	Dec. 1963	Rt			123
tailwaters of Glen Cyn Dam	1A	703.7		AGF	7/1/72 6/30/73	GN			124
tailwaters of Glen Cyn Dam	1A	703.7		P.B. Holden	7/67& 8/70	GN	UCFRU		60
Grand Canyon Nat'l Park	1B	688.6-412.3			1942		Park collection		86

47. channel catfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Grand Canyon Nat'l Park	1B	688.6-412.3		P.B. Holden C.B. Stalnaker	summer 1972	Ag	UCFRU		63
Marble Canyon	1B	684.2	r	P.B. Holden C.B. Stalnaker	1967-1973	GN,Sn, EF,Ag	UCFRU		63
Shinumo Creek	1B	659.6		R. Suttkus et al.	1970-1976	SMMS	TU		126
Hance Creek	1B	610.4		G. Reed	1909	Ag			21
Bright Angel Creek	1B	601.3		E.D. McKee	6/22/1937		ASU		15
Bright Angel Creek	1B	601.3		A. Wolf J. Blaisdell	7/12/1963		ASU		15
Bright Angel Creek	1B	601.3		J. Blaisdell	2/18/1964		ASU		15
Hermit Rapids	1B	594.3		E. Ennis	1912	Ag			21
Kanab Creek	1B	546.1		R. Suttkus et al.	1970-1976	SMMS	TU		126
Kanab Creek	1B	546.1		R. Suttkus et al.	1970-1976	SMMS	TU		126
Spencer Creek	2	444.1		R. Suttkus et al.	1970-1976	SMMS	TU		126
Above Pierce Ferry	2	409.7	c		1951				147
Lake Mead	2	409.7-342.2	c	J. Moffett	1941-1942	Ob,Ag, GN,Sn			104
Lake Mead	2	409.7-342.2	a	A. Jonez R. Sumner	1951-1954	Sn,Ob, Ag,P,Tr			68
Lake Mead	2	409.7-342.2			1962				75
Lake Mead	2	409.7-342.2	479	AGF	1976-1977	CC			77
Pierce Ferry	2	409.7	4	R.R. Miller	[?]				90
Pierce Ferry	2	409.7		Anglers	1968	Ag			116
Overton Arm	2	368.0		USBR	1971-1972	Ob			131
Moapa River Overton Arm	2	368.0		Zool. 414	2/25/1967		ASU		15

47. channel catfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Moapa River Overton Arm	2	368.0		J. Deacon G. Bradley	1967	Sn EF	UNLV		33
Roger Springs Overton Arm	2	368.0		W.L. Minckley J. Deacon Zahuranec et al.	Dec. 7&8/ 1963		ASU		15
Lower Colo. River	3A	342.2-276.0							99
Lake Mohave	3A	342.2-276.0			1942				103
Lake Mohave	3A	342.2-276.0	c	A. Jonez R. Sumner	7/50-6/54	Ob,CC, GN			68
Lake Mohave	3A	342.2-276.0		AGF	summer 1961	GN			84
Willow Beach	3A	329.8	2	R.R. Miller	8/16/41				90
Cottonwood Landing	3A	298.3		W.L. Minckley et al.	2/3-6/ 1977		ASU		15
Lower Colo. River	3B	276.0-223.9							99
Lake Havasu area	3B-3C	276.0-192.3	c	R.D. Beland	1950-1952	Sn,GN, Rt,CC			19
Davis Dam to Needles, Cal.	3B	276.0-244.36	fairly abundant		1951				18
Lower Colo. River	3C	223.9-192.3							99
Mohave County	3C	205.9		J. Landye W. Kepner	10/18/ 1975		ASU		15
Mohave County	3C	193.4		J. Landye W. Kepner	10/21/ 1975		ASU		15
Lower Colo. River	4A	192.3-177.9							99
Parker Dam, Imperial Dam	4A-4C	192.3-119.2	264	G. McCammon	12/53-5/54	tagging experiment			81
Moolvaya Lake	4A	191.5-177.7		G. Kobetich	1972	GN			98
Mohave County	4A	190.3		J. Landye W. Kepner	10/20/ 1975		ASU		15

47. channel catfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River	4B	177.9-133.8							99
Deer Island	4B	172.0-169.1		M.K. Saiki	1975	EF		74% of catch	110
Lower Colo. River	4C	133.8-49.2							99
Yuma County	4C	127.9		LCRBR lab	3/8/75		ASU		15
Backwater A-7	4C	118.7	c	M.A. Singer et al.	11/71-10/72	GN EF			115
Backwater A-10	4C	113.8	c	M.A. Singer et al.	11/71-10/72	GN EF			115
Walkers Camp	4C	90.0-87.0	5	P.D. Ashley et al.	9/12-14/1973	GN			133
Martinez Lake	4C	54.6		Zool. 414	2/14/1976		ASU		15
Lower Colo. River	5A	49.2-43.2							99
Imperial Reservoir	5A	49.2		R.O. Weaver	8/3/69-10/31/70	Rt			148
Lower Colo. River	5B	43.2-22.1							99
Lower Colo. River	5C	22.1-0							99
Yuma Drainage Canal	5C	29.7		E. McClendon	11/28/1965		ASU		15
Morelos Dam	5C	22.1		E. McClendon E.O. Williams	3/19/1966		ASU		15
Hunters Hole	5C	2.4	few	W.L. Minckley R. McNatt	Apr. 1974	EF			101
Yuma County	5C	1.0		Emmitt E. McClendon	10/21/1967		ASU		15

48. flathead catfish
Pylodictis olivaris

classification: non-native, game fish
occurrence: has spread from Yuma to the Blythe area and has moved into the entire Imperial Valley system (Cal. Fish and Game, 1965)
rel. abundance: increasing very rapidly (Essbach, 1967; Minckley, 1973)
date of intro.: 1962 into Martinez Lake, the area north of Yuma (Essbach, Arizona Game and Fish, 1977)
museum coll.: ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River	4A	192.3-177.9							99
Lower Colo. River	4B	177.9-133.8							99
Lower Colo. River	4C	133.8-49.2							99
Backwater A-7	4C	118.7			11/71-10/72	GN EF			115
Backwater A-10	4C	113.8			11/71-10/72	GN EF			115
Walters Camp	4C	87 - 90	1	P.D. Ashley	9/12-14/1973	GN			133
Martinez Lake	4C	56.3		Anglers	1965-1966	CC		showing up in increasing no.s	41
Martinez Lake	4C	56.3		Anglers	1967	CC			42
Lower Colo. River	5A	49.2-43.2							99
Lower Colo. River	5B	43.2-22.1							99
Yuma area	5B	28.6-30.8			1965				26
Yuma area	5B	28.6-30.8		Anglers	1968	Ag			43
north of Yuma	5B	29			Mar. 1962			planted by AGF	92

48. flathead catfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Main Drain	5B	24.0		LCRBR lab	8/17/74		ASU		15
Lower Colo. River	5C	22.1-0							99
below Morelos Dam	5C	22.1		Emmit E. McClendon	5/26/ 1967		ASU		15
Colo. River	5C	15.4		LCRBR lab	8/17/74		ASU		15
Colo. River	5C	10.6		LCRBR lab	4/18/74		ASU		15
Hunters Hole	5C	2.4	2	W.L. Minckley	4/74				101
Hunters Hole	5C	2.4		W.L. Minckley R. McNatt Robertson Rassett	1974				15
1 mi. above Internat'l Boundary		1.0		Emmitt E. McClendon	10/20/ 1967		ASU		15

49. walking catfish - Clariid catfish
Clarias batrachus

classification: non-native, non-game
occurrence: one individual recorded for Yuma area (ASU Museum Reg.); two individuals from Rogers Spring near Overton Arm, Lake Mead (Nevada Fish and Game, 1978)
rel. abundance: incidental
date of intro.: one specimen collected in 1970 (ASU Museum Reg.)
museum coll.: ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Rogers Spring Overton Arm	2	368.0	2		1971				105
Imperial Co., Cal.-All Amer. Canal below Winterhaven	5A	ca 48.7	1	Anglers	4/10/ 1970	Ag	ASU		15
Lower Colo. River	5B	43.2-22.1							99

50. White River killifish
Crenichthys baileyi

classification: native to Pluvial White River, Nevada - a former tributary to the Colorado (Minckley, 1969); non-game fish; on Nevada's Classification of Wildlife list, March 6, 1978

occurrence: local populations in White River (Minckley, 1969); historic range inundated by Lake Mead (personal communication with W.L. Minckley, 1978)

rel. abundance: local populations abundant in the White River (Minckley, 1969)

51. desert pupfish
Cyprinodon macularius

classification: native to lower Colorado River basin; non-game fish; on Arizona's Threatened and Unique Species list, October 21, 1978

occurrence: past distribution throughout the lower Gila River and marshy habitats throughout the lower Colorado into the Salton Sea; presently extirpated from the Colorado and Gila Rivers (Minckley, 1969)

rel. abundance: historically was common (Miller and Lowe, 1964); has become extirpated from the Colorado mainstem (Minckley, 1969)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River				C.H. Gilbert	1893				85
Colorado River Basin				B.W. Evermann C. Rutter	1895				85
Colorado River Basin				S. Garman	1895				85
Colorado River				C.H. Gilbert N.B. Scofield	1898				85
Colorado Basin				S.E. Meek	1904				85
Colorado Basin				E. Blackwelder	1933				85
Lower Colo. River				R. Cowles	1934				85

51. desert pupfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Colo. River System				C.L. Hubbs R.R. Miller	1941				85
Lower Colo. & Gila Rivers				C.L. Hubbs R.R. Miller	1941				85
Lower Colo. River	5B	43.2-22.1							99
Lower Colo. River	5C	22.1-0							99

52. California killifish - Southern California killifish
Fundulus parvipinnis

classification: non-native, bait fish; (currently not legal bait fish in Arizona)
occurrence: found in bait shop in Yuma, Arizona on experimental basis to see if they could be successfully used for bait - ultimately attempts to use this fish as bait were abandoned
rel. abundance: not established
date of intro.: 1951 as a bait fish

(Miller, 1952)

53. Rio Grande killifish - southwestern plains killifish
Fundulus zebrinus

classification: non-native, bait fish; (currently not legal bait fish in Arizona)
occurrence: Grand Canyon area (C.O. Minckley and Blinn, 1975); used as bait fish along lower Colorado (Miller and Lowe, 1967)
rel. abundance: second most encountered non-native in Grand Canyon (Minckley and Blinn, 1975)
date of intro.: first recorded for bait use in 1950 (Miller, 1952)
museum coll.: UU
TU
UNLV

53. Rio Grande killifish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Warm Creek, Glen Canyon		716.4	5	G. Smith G. Musser D. McDonald	1958	HS	UU		81
Cardenas Creek	1B	633.2		R. Suttkus et al.	1970-1976	SMMS	TU		81
Little Colo. River	1B	627.4	2	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Little Colo. River	1B	627.4		R. Suttkus et al.	1970-1976	SMMS	TU		81
Pipe Creek	1B	600.2	3	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Crystal Creek	1B	591.0	5	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Crystal Creek	1B	591.0		R. Suttkus et al.	1970-1976	SMMS	TU		81
Elves Chasm	1B	572.8	1	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Stone Creek	1B	557.7	1	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Parashont Wash	1B	491.5	6	C.O. Minckley D. W. Blinn	7&8/1975	Sn	NAU		93
Spencer Creek	2	444.1		R. Suttkus et al.	8/8/1976	SMMS	TU		81
Spencer Creek	2	444.1		J. Deacon J. Baker	3/7&29/4/24/5/23/76	Sn	UNLV		34
Surprise Canyon	2	441.7		J. Deacon J. Baker	3/7&29/4/24/5/23/76	Sn	UNLV		34
Intake Store	4C	121.4		W.A. Evans	7/5/1950				88
Williams Bait Shop, Yuma	5B	ca 30		W.A. Evans P.A. Douglas	3/23/1950				88

54. mosquitofish - western mosquitofish, mosquito minnow
Gambusia affinis

classification: non-native, non-game bait fish
occurrence: throughout Colorado mainstem (Minckley, 1969)
rel. abundance: uncommon in Grand Canyon, common elsewhere (see references below)
date of intro.: planted in California in 1922 and eventually reached Colorado River (Dill, 1944)
museum coll.: UU, TU, UNLV, ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Warm Creek, Glen Canyon		716.4		G. Smith G. Musser D. McDonald	6/30-8/8/1958	Ob	UU		119
Emery Falls	2	415.0		R. Suttkus et al.	1970-1976	SMMS	TU		126
Emery Falls	2	415.0	15	J. Deacon J. Baker	3/7&29/4/24/5/23/76	Sn	UNLV		34
Lake Mead	2	409.7-342.2			ca. 1938				92
Lake Mead	2	409.7-342.2		J.W. Moffett	1941-1942	Ob,Ag, GN,Sn		occurs around lake	104
Lake Mead	2	409.7-342.2	c		1962			occurs along L. Mead shores	75
Lake Mead	2	409.7-342.2	r	A. Jonez R. Sumner	7/51-6/54	Ag,Sn, P,Tr,GN			68
Pierce Ferry	2	409.7		R. Suttkus et al.	1970-1976	SMMS	TU		126
Moapa River, Overton Arm	2	368.0		C.L. Hubbs	1938-1942	Ob			91
Lower Colo. River	3A								99
Davis Dam to Needles	3B	276.0-244.4	limited						18

54. mosquitofish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Havasu	3B-3C	257.5-192.3	small numbers		1950-1952				19
Lake Havasu	3B-3C	257.5-192.3	c		1954				19
Lower Colo. River	4A								99
Yuma County	4B	ca 177		LCRBR lab	4/14/74		ASU		15
Deer Island Lake	4B	172.0-169.1		LCRBR lab	10/73-8/75	EF, SN,GN			110
Yuma County	4B	157.6		W.L. Minckley	4/19/74		ASU		15
Yuma County	4B	154.0		W.L. Minckley	7/10/74		ASU		15
Yuma County	4B	148.7		LCRBR lab	6/21/74		ASU		15
Backwater A-7	4C	118.7		M.A. Singer et al.		GN EF			115
Imperial Reservoir	5A	49.2		R.O. Weaver	9/3/69 10/31/69	Rt			148
Yuma Drainage Canal	5B	29.7		E. McClendon	11/28/1965		ASU		15
Yuma Drainage Canal	5B	29.7		LCRBR lab	8/8/1974		ASU		15
Hunters Hole	5C	2.4	uncommon	W.L. Minckley R. McNatt	4/5-7/1974		ASU		101
Yuma County	5C	2.0		LCRBR lab	8/18/74		ASU		15

55. guppy
Lebistes reticulatus
(see narrative, no. 59)

56. sailfin molly
Poecilia latipinna
(see narrative, no. 59)

57. shortfin molly - Mexican molly
Poecilia mexicana
(see narrative, no. 59)

58. green swordtail
Xiphophorus helleri
(see narrative, no. 59)

59. southern platyfish
Xiphophorus maculatus

classification: non-native, non-game fishes
occurrence: local populations only, mostly in extreme southern portion of river (Minckley, 1969); introductions also made in tributaries near Overton Arm, Lake Mead (Deacon et al., 1964; ASU Museum Reg)
rel. abundance: uncertain
date of intro.: 1950's and 1960's (Deacon et al., 1964; Minckley and McNatt, 1974)
museum coll.: ASU

60. white bass
Morone chrysops

classification: non-native, game fish
occurrence: lower Colorado River near Yuma
rel. abundance: uncertain, populations greatly fluctuate
date of intro.: late 1960's
(Minckley, 1973)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River	4C								99
Lower Colo. River near Yuma	5B	ca. 30.8-28.6			1960			stocked	97

61. striped bass
Morone saxatilis

classification: non-native, game fish
occurrence: Lake Mead to Senator Wash Reservoir (see references below)
rel. abundance: common in Lake Mead (Nevada Fish and Game, 1978); appear to be reproducing and have established a major fishery in the lower Colorado (Minckley, 1969);

date of intro.: 1959 in lower Colorado River (St. Amant, 1959)
museum coll.: ASU, TU

61. striped bass (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mead	2	409.7-342.2	1	R. Suttkus et al.	1970-1976	SMMS	TU	one dead striped bass	126
Temple Bar	2	378.0						increased since 1963	70
Lower Colo. River	3A								99
Davis Dam	3B	276.0		Anglers	1968	Ag			43
Davis Dam	3B	276.0		G. Edwards	11/12/69		ASU		15
Davis Dam	3B	276.0		J. KIng	6/12/70		ASU		15
Lake Havasu	3C	223.9-192.3			1952				129
Lake Havasu	3C	223.9-192.3			1972	Ob			53
Lake Havasu	3C	223.9-192.3		Anglers	Feb. 1978	Ag			6
Lower Colo. River	3C	190.6		L. Kipner	12/18/1975		ASU		15
Lower Colo. River	3C	190.6			FY 1974			planted by AGF	17
Lower Colo. River	4A-4B								99
Blythe area	4C	121.3	938		4/15/1959			planted by CFG	113
Ehrenberg Bridge	4C	121.3		M.A. Singer et al.	11/71-10/72	GN EF			115
Senator Wash Reservoir	4C	50.2		D. Mossier	4/23/1968		ASU		15

62. green sunfish
Lepomis cyanellus

classification: non-native, forage and bait fish
occurrence: various places throughout mainstem (Minckley, 1973)
rel. abundance: common in the river from Lake Mead to Lake Havasu (Dill, 1944)
date of intro.: accomplished along with bluegill in the 1937-1942 era (Jonez and Sumner, 1954)
museum coll.: TU, GCNP, UNLV, ASU, UU

62. green sunfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Aztec Canyon, Glen Canyon		757.2	1	G. Smith G. Musser D. McDonald	6/30-8/8/1958	Ob	UU		119
Spencer Creek	2	444.1		R. Suttkus et al.	1970-1976	SMMS	TU		126
Surprise Canyon	2	441.7	2	J. Deacon J. Baker	3/7&29/, 4/24/, 5/23/1976	Sn	UNLV		34
Lake Mead	2	409.7-342.2	numerous		1951				147
Lake Mead	2	409.7-342.2	c	A. Jonez R. Sumner	7/51-6/54	GN,Ag, Tr,Sn,P			68
upper basin Lake Mead	2	401.4-375.0	numerous	USBR		Ob		5 observation sites	136
Overton Arm, Lake Mead	2	368.0	numerous	USBR	1972	Ob		4 observation sites	131
shore of L. Mead near Moapa River	2	368.0		G.L. Hubbs	7/28/1942	Ob			91
Lower Moapa River, Lake Mead	2	368.0	2	J. Deacon J. Bradley	1964	Sn	UNLV		33
Lower Moapa River, Lake Mead	2	368.0	4	J. Deacon J. Bradley	1966	EF SN	UNLV		33
Lower Moapa River, Lake Mead	2	368.0	1	J. Deacon J. Bradley	1967	EF SN	UNLV		33
Callville Bay	2	351.5	numerous	USBR	1972	Ob			130
Swallow Bay	2	349.0	numerous	USBR	1972	Ob			130
Lake Mohave	3A	342.2-276.0	a		7/50-6/54	Ob GN			68
Lake Havasu area	3B-3C	276.0-192.3	c	R.D. Beland	1954				19
Lake Havasu area	3B-3C	276.0-192.3	numerous	USBR USFWS	1972	EF,GN, Ob			53

62. green sunfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Havasu area	3B-3C	276.0-192.3	thriving		1973	EF,GN, Ob			109
14 mi. below Davis Dam	3B	262.0	c	A. Jonez R. Sumner	7/50-6/54	Ag			68
Havasu Boat Landing	3C	214.0	10	R.D. Beland	1951	Sn			19
1 mil no. of Colo. River Aqueduct, Lake Havasu	3C	195.0	71	R.D. Beland	1951	Rt			19
Colo. River Aqdt,L. Havasu	3C	194.3	147	R.D. Beland	1950	Rt			19
Colo. River Aqdt,L. Havasu	3C	194.3	21	LCRBR lab	6/9/1974		ASU		15
Deer Island Lake	4B	172.0-169.1	6	M.K. Saiki et al.	Jan. 1975	EF		18% of catch	110
Lower Colo. River	4B	163.0		LCRBR lab	6/14/1974		ASU		15
Lower Colo. River	4B	143.7		LCRBR lab	6/19/1974		ASU		15
Lower Colo. River	4B	133.6		LCRBR lab	6/12/1974		ASU		15
Backwater A-7	4C	118.7		M.A. Singer et al.	11/71-10/72	GN EF			115
10.5 km below Ehrenburg Bridge	4C	114.3		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Backwater A-10	4C	113.8		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Lower Colo. River	4C	112.3		LCRBR lab	3/8/1975		ASU		15
Martinez Lake	4C	56.3		Zool. 414	2/14/76		ASU		15
Imperial Reservoir	4C	ca 49.2	25	R.O. Weaver	9/3/69-10/31/70	Rt			148

62. green sunfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Laguna Dam	5A	43.2		R.R. Miller	6/13/48				90
Lower Colo. River	5B								99
Morelos Dam	5C	22.1		E. McClendon D. Williams	3/19/ 1966		ASU		15
below Morelos Dam	5C	ca 22.1		E. McClendon	1967		ASU		15

63. warmouth
Lepomis gulosus

classification: non-native, game fish
occurrence: lower Colorado as far up as Lake Mohave (Minckley, 1969)
rel. abundance: abundant along the mainstream, in backwaters and in some larger drains (Minckley, 1973)
date of intro.: uncertain, species gained access to Arizona by mistake, with a few individuals being mixed with a stock of other, more desired species such as bass or bluegill (Minckley, 1973)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River					1958				92
Lake Havasu area	3B-3C	276.0-192.3			1972				129
Lower Colo. River	4A								99
Palo Verde Divers. Dam	4C	133.8	1	S. Sasaki L. Redfern	1961	GN,Sn, Ag			76
Palo Verde Divers. Dam	4C	133.8	2		1963	GN,Sn, Ag			76
Palo Verde Divers. Dam	4C	133.8	3		1964	GN,Sn, Ag			76
Backwater A-7	4C	118.7		M.A. Singer et al.	9/71-10/72	GN(Nov-Mar) EF Mar-Oct			115

63. warmouth (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
10.5 km below Enrenberg Bridge	4C	114.3		M.A. Singer et al.	9/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Backwater A-10	4C	113.8		M.A. Singer et al.	9/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Above Imperial Dam	4C	49.2+		D. McClendon	5/12/1967		ASU		15
Above Imperial Dam	4C	49.2+	113	R.O. Weaver	9/3/69-10/31/70	Rt			148
Morelos Dam	5C	22.1		LCRBR lab	9/7/74		ASU		15

64. bluegill
Lepomis macrochirus

classification: non-native, game fish
occurrence: found throughout most of the mainstem (Minckley, 1973)
rel. abundance: abundant in Lake Mead and Lake Mohave (Nevada Fish and Game, 1979)
date of intro.: 1937 in Lake Mead (Wallis, 1951)
museum coll.: TU, ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Spencer Creek	2	444.1		R. Suttkus et al.	1970-1976	SMMS	TU		126
Lake Mead	2	409.7 342.2		J.W. Moffett	1941-1942	Ag,GN, Sn,Ob		second most common game fish	104
Lake Mead	2	409.7-342.2	c		1946				91
Lake Mead	2	409.7-342.2	a	D.C. Wallis	1950				59
Lake Mead	2	409.7-342.2	c	A. Jonez R. Sumner	7/51-6/54	GN,Ag, Tr,Sn,P			68
Lake Mead	2	409.7-342.2		Anglers	1978	Ag			70

64. bluegill (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Las Vegas Wash	2	347.5		J. Leonard	5/17/ 1962		ASU		15
Las Vegas Wash	2	347.5		D. Davenport	5/20/ 1962		ASU		15
Lake Mohave	3A	342.2-276.0			1950's				70
Lake Mohave	3A	342.2-276.0	a	A. Jonez R. Sumner	7/50-6/54	Ob,GN, CC			68
Lake Mohave	3A	342.2-276.0	not numerous		1951				8
Lake Havasu area	3B-3C	257.5-192.3	15	R.D. Beland	1950-1952	GN			19
Lake Havasu area	3B-3C	257.5-192.3	a	R.D. Beland	1954				19
Davis Dam to Needles, Cal.	3B	276.0-244.36	limited		1951				18
14 mi. below Davis Dam	3B	262.0	c	A. Jonez R. Sumner	7/70-6/74	Ag			68
½ mi. so. Cal/ Nev. stateline	3B	257.0		J. Deacon	3/11/ 1961		ASU		15
Needles Boat Landing	3B	ca 244.36	3	P.A. Douglas	1950	nets			37
Lake Havasu	3C	223.9-192.3	numerous	USBR, AGF, USFWS, CFG	1972	Ob,EF, GN			53
Lake Havasu	3C	223.9-192.3	thriving		1973				109
Blankenship Bend	3C	223.0		Zool. 414	2/21/ 1976				15
Havasu Boat Landing	3C	214.6	123	R.D. Beland	1951	Sn			19
Colo. River Aqdt,L. Havasu	3C	194.3	114	R.D. Beland	1950	Rt			19
Colo. River Aqdt,L. Havasu	3C	194.3	51	R.D. Beland	1951	Rt			19
Colo. River Aqdt,L. Havasu	3C	194.3	144	R.D. Beland	1954	Rt			19

64. bluegill (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River	4A								99
Lower Colo. River	4B	177.2		LCRBR lab	6/14/ 1974		ASU		15
Deer Island Lake	4B	172.0-169.1		M.K. Saiki	Jan. 1975	EF		97% of sample	110
Lower Colo. River	4B	157.9		LCRBR lab	6/19/ 1974		ASU		15
Lower Colo. River	4B	153.8		LCRBR lab	7/10/ 1974		ASU		15
Lower Colo. River	4B	148.7		LCRBR lab	6/21/ 1974		ASU		15
Lower Colo. River	4C	126.4		LCRBR lab	3/8/ 1975		ASU		15
Backwater A-7	4C	118.7		M.A. Singer et al.	11/71-10/72	Ob EF			115
10.5 km below Ehrenberg Bridge	4C	114.3		M.A. Singer et al.	11/71-10/72	Ob EF			115
Lower Colo. River	4C	56.7		Zool. 414	2/14/ 1976		ASU		15
Imperial Reservoir	4C	ca 49.2		E. McClendon	5/12/ 1967		ASU		15
Imperial Reservoir	4C	ca 49.2	507	R.O. Weaver Ziebell	9/3/69-10/31/70	Ob, Sampling			149
Lower Colo. River	5A								99
Lower Colo. River	5B	37.3		LCRBR lab	6/18/ 1975		ASU		15
Morelos Dam	5C	22.1		E. McClendon D. Williams	3/19/ 1966		ASU		15
below Morelos Dam	5C	ca 22.1		E. McClendon	1967		ASU		15

64. bluegill (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
East Main Canal	5C	15.0		LCRBR lab	9/3/ 1974		ASU		15
Lower Colo. River	5C	6.5		LCRBR lab	8/12/ 1974		ASU		15
Hunters Hole	5C	2.4	11	W.L. Minckley	4/74	nets	ASU		101
Lower Colo. River	5C	1.9		LCRBR lab	8/18/ 1974		ASU		15

65. redear sunfish
Lepomis microlophus

classification: non-native, game fish
occurrence: lower Colorado River as far up as Hoover Dam (see references below)
rel. abundance: abundant (Miller and Lowe, 1964)
date of intro.: first caught in the lower river in 1951 (Miller and Lowe, 1964)
museum coll.: ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
below Lake Mead	3A-5C	342.2-0	now abundant		4/27/ 1951				92
Lower Colo. River	3B								99
Lower Colo. River	3C								99
Moovalya Lake	4A	191.5-177.9	1	G. Kobetich	1972	GN			98
Deer Island Lake	4B	172.0-169.1		M.K. Saiki	Jan. 1975	EF		82% of catch	110
Lower Colo. River	4B	154.2		LCRBR lab	7/10/ 1974		ASU		15
Lower Colo. River	4B	148.2		LCRBR lab	6/12/ 1974		ASU		15
Lower Colo. River	4C	126.4		LCRBR lab	3/8/ 1975		ASU		15

65. redear sunfish (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Backwater A-7	4C	118.7	c	M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
10.5 km below Ehrenberg Bridge	4C	114.3	c	M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Backwater A-10	4C	113.8	c	M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Martinez Lake	4C	56.3		Zool. 414	2/14/1976		ASU		15
Imperial Reservoir	4C	49.2+		E. McClendon	5/12/1967		ASU		15
Lower Colo. River	5B	37.3		LCRBR lab	6/18/1975		ASU		15
above Morelos Dam	5B	ca 22.1		E. McClendon D. Williams	3/19/1966		ASU		15
below Morelos Dam	5C	ca 22.1		E. McClendon	1967		ASU		15
East Main Canal	5C	15.0		LCRBR lab	9/3/1974		ASU		15
Lower Colo. River	5C	6.5		LCRBR lab	8/12/1974		ASU		15
Hunters Hole	5C	2.4	11	W.L. Minckley	4/74	netted	ASU		101
Lower Colo. River	5C	1.9		LCRBR lab	8/18/1974		ASU		15

66. smallmouth bass
Micropterus dolomieui

classification: non-native, game fish
occurrence: lower Colorado River as far up as Lake Mead (see following references)
rel. abundance: rare in the lower river (Minckley, 1973)
date of intro.: first catch in mainstem recorded in 1953 (Miller and Lowe, 1964)
museum coll.: ASU

66. smallmouth bass (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
shore of Lake Mead	2	409.7-342.2		C.L. Hubbs	7/28/1942	Ob		fish seen in schools	91
below Davis Dam	3B	ca 276.0		G. Edwards	1/30/1970		ASU		15
Lake Havasu	3C	223.9-192.3		Anglers	Feb. 1978	Ag			6
Lower Colo. River	4A								99
Lower Colo. River	4B								99
Backwater A-7	4C	118.7		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Nov-Mar			115
10.5 km below Ehrenberg Bridge	4C	114.3		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Nov-Mar			115
Backwater A-10	4C	113.8		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Nov-Mar			115

67. largemouth bass - black bass, bucketmouth bass
Micropterus salmoides

classification: non-native, game fish
occurrence: throughout mainstem, except the Grand Canyon (see following references)
rel. abundance: common in Lake Mead, abundant in Lake Mohave (Nevada Fish and Game, 1978); abundant in lower portion of river (McCammon, 1956)
date of intro.: 1890 in Aztec Canyon, Utah (Smith et al., 1959); 1935 in Lake Mead by USFWS (Jonez and Sumner, 1954)
museum coll.: TU
UNLV
UU
ASU

67. largemouth bass (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Aztec Canyon, Glen Canyon		703.8-688.6	1		6/30-8/8/1958	Ob Rt	UU	more observed	119
Glen Cyn Dam to Lees Ferry	1A	703.8-688.6	2	AGF	1964	GN			123
Glen Cyn Dam to Lees Ferry	1A	703.8-688.6	40	AGF	1964	Rt			123
Spencer Creek	2	444.1		R. Suttkus et al.	1970-1976	SMMS	TU		126
Emery Falls	2	415.0		R. Suttkus et al.	1970-1976	SMMS	TU		126
Emery Falls	2	415.0	2	J. Deacon J. Baker	3/7&29/, 4/24/, 5/23/76		UNLV		34
Lake Mead	2	409.7-342.2	80,000		1939			fingerlings stocked	91
Lake Mead	2	409.7-342.2	c	J.W. Moffett	1941-1942	GN,Ag, Ob,Sn			104
Lake Mead	2	409.7-342.2		R.R. Miller T.R. Alcorn	1943				60
Lake Mead	2	409.7-342.2	c		1946				91
Lake Mead	2	409.7-342.2	a	A. Jonez R. Sumner	7/51-6/54	GN,Ag, Ob,P			68
Upper Basin Lake Mead	2	409.7-376.1	416	NFG for USBR	1972	Ob		fingerlings, adults,yearlings	136
Driftwood Cove	2	401.4	512	Romero Groom Johansen	11/2/1973	Ob			134
Temple Bar	2	378.0			1978				70
South Cove	2	393.5	103	Romero Groom Johansen	11/1/1973				134
Overton Arm	2	368.0		W.L. Minckley J. Deacon Kuehn	12/7/1963		ASU		15

67. largemouth bass (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Overton Arm	2	368.0	209	NFG for USBR	1972	Ob			131
Lower Moapa River, Overton Arm	2	368.0	4	J. Deacon J. Bradley	1966-1967	EF Sn	UNLV		33
Echo Bay, Overton Arm	2	368.0	57	Romero Groom Johansen	11/2/1973				134
Callville Bay	2	351.5	265	NFG for USBR	1972	Ob		fingerlings, adults,yearlings	130
Swallow Bay	2	349.0	157	NFG for USBR	1972	Ob			130
Swallow Bay	2	349.0	2009	NFG	1973	Ob		fingerlings	3
Swallow Bay	2	349.0	435	NFG	1973	Ob			2
Burrow Point	2	348.5	272	NFG	1973	Ob		fingerlings	3
Burrow Point	2	348.5	1020	NFG	1973	Ob			2
Lake Mohave	3A	342.2-276.0	a	A. Jonez R. Sumner	7/50-6/54	Ob GN			68
Lake Mohave	3A	342.2-276.0		AGF	1951			"sizeable population"	8
Lake Mohave	3A	342.2-276.0		AGF	June 1961	Ob			84
Cottonwood Landing	3A	298.3		W.L. Minckley et al.	2/3-6/1977		ASU		15
below Davis Dam	3B	276.0	c	A. Jonez R. Sumner	7/50-6/54	Ag			68
Lake Havasu	3B-3C	257.5-192.3	a		1944				68
Lake Havasu	3B-3C	257.5-192.3	c		1954				19
Lake Havasu area	3B-3C	276.0-192.3			1973			"well established"	109
Davis Dam to Needles, Cal.	3B	276.0-244.36			1951				18
Havasu Boat Landing	3C	214.0	65	R.D. Beland	1951	Sn			19
Lower Colo. River	3C	202.4		Landye W. Kepner	12/18/1975		ASU		15

67. largemouth bass (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Colo. River Aqueduct	3C	194.3	5		1951	Rt			19
Colo. River Aqueduct	3C	194.3	24	R.D. Beland	1952	Rt			19
Lower Colo. River	3C	192.9		Landye W. Kepner	12/12/ 1975		ASU		15
Parker to Imperial Dam	4A	192.3-49.2	a		1953				81
Moovalya Lake	4A	191.5-177.9	6	G. Kobetich	1972	GN			98
Lower Colo. River	4B	177.2		LCRBR lab	6/14/ 1974		ASU		15
Deer Island Lake	4B	172.0-169.1	415	M.K. Saiki et al.	Jan. 1975	EF		100% of catch	110
Lower Colo. River	4B	157.7		LCRBR lab	6/19/ 1974		ASU		15
Lower Colo. River	4B	148.7		LCRBR lab	6/21/ 1974		ASU		15
Lower Colo. River	4C	133.8		LCRBR lab	7/12/ 1974		ASU		15
Lower Colo. River	4C	126.4		LCRBR lab	3/8/ 1975		ASU		15
Backwater A-7	4C	118.7	a	M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
10.5 km below Ehrenberg Bridge	4C	115.6	a	M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Backwater A-10	4C	113.8	a	M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Walters Camp	4C	90.0	17	Ashley et al.	1973	GN			133
Walters Camp	4C	88.4	17	Ashley et al.	1973	GN			133
Lower Colo. River	4C	56.7		Zool. 414	2/14/ 1976		ASU		15
Imperial Reservoir	4C	49.2+	299	R.O. Weaver C.D. Ziebell	9/3/69-10/31/70	Rt Ob		others observed	148

67. largemouth bass (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
main outlet, Yuma desalting complex	5A	49.0			1973				132
Lower Colo. River	5B	37.3		LCRBR lab	6/18/ 1975		ASU		15
Morelos Dam	5C	22.1		E. McClendon D. Williams	3/19/ 1966		ASU		15
Lower Colo. River	5C	20.8		LCRBR lab	8/20/ 1974		ASU		15
Lower Colo. River	5C	15.1		LCRBR lab	8/13/ 1974		ASU		15
Hunters Hole	5C	2.4		Anglers	1974	Ag			101
Hunters Hole	5C	2.4		W.L. Minckley	1974		ASU		101
Hunters Hole	5C	2.4		LCRBR lab	9/21/74		ASU		15

68. white crappie - crappie, calico bass (Dill, 1944)
Pomoxis annularis

classification: non-native, game fish
occurrence: lower Colorado River as far up as Lake Mohave (see following references)
rel. abundance: limited, rare in collections (Minckley, 1973)
date of intro.: first record of white crappie in lower Colorado River in 1934 (Miller and Lowe, 1964)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mohave	3A	342.2-276.0	"limited"		1951				109
Lake Havasu area	3B-3C	257.5-172.3	r		1954				19
Topock Marsh	3C	244.3	14		1968				97
Headgate Rock Dam	4A	177.9	1	W.A. Dill	1942				35
Haughtelin Lake	5B	40 - 30			1934				92

68. white crappie (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Haughtelin Lake	5B	40 - 30	5	W.A. Dill					35
mouth of Gila River	5B	34	4	W.A. Dill	1942				35
Alamo Canal	5B	24	2	W.A. Dill	1942				35
9 mi. so. of Morelos Dam	5C	12.9	3		3/22/ 1950				90

69. black crappie - crappie, calico bass (Dill, 1944)
Pomoxis nigromaculatus

classification: non-native, game fish
occurrence: lower Colorado as far up as Lake Mead (see following references)
rel. abundance: abundant in Lakes Mead and Mohave (Nevada Fish and Game, 1978): according to Miller and Lowe (1964), it is more plentiful than bluegill
date of intro. 1935-1940 into Lake Mead by USFWS (Jonez and Sumner, 1954)
museum coll.: Boulder Dam National Recreation Area, ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mead	2	409.7-342.2			1941-1942	Ob,Ag, GN,Sn			104
Lake Mead	2	409.7-342.2			1951			important game fish	147
Lake Mead	2	409.7-342.2	a	A. Jonez R. Sumner	7/51-6/54	Ob,GN,P, Ag,Tr,Sn			68
Lake Mead	2	409.7-342.2		Anglers	1968	Ag		good fishing	116
Temple Bar	2	378.0	1	R.K. Grater	9/12/ 1940		LMNRA		91
Grebe Bay	2	372.7	1	NFG for USBR	1972	Ob			136
Callville Bay	2	351.5	3	NFG for USBR	1972	Ob		2 adults, 1 fingerling	130
Swallow Bay	2	349.0	4	NFG for USBR	1972	Ob			130
Lake Mohave	3A	342.2-276.0	c	A. Jonez R. Sumner	7/50-6/54	Ob,GN, CC			68

69. black crappie (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mohave	3A	342.2-276.0	limited	AGF	1951				8
below Hoover Dam	3A	342.2	r		1950				147
Lake Havasu area	3B-3C	257.5-192.3	1	W.A. Dill	1942				35
Lake Havasu area	3B-3C	257.5-192.3	c	R.D. Beland	1954				19
Lake Havasu area	3B-3C	276.0-192.3	few		1972				53
Lake Havasu	3B-3C	276.0-192.3	few		1972-1973				109
Lake Havasu	3B-3C	276.0-192.3	numerous	Anglers	May 1977	Ag			5
Davis Dam to Needles, Cal.	3B	276.0-244.36			1951				18
Lower Colo. River	4A								99
Deer Island Lake	4B	172.0-169.1	15	M.K. Saiki et al.	Jan. 1975			32% of catch	110
Lower Colo. River	4B	157.7		LCRBR lab	6/19/1974		ASU		15
Backwater A-7	4C	118.7		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
10.5 km below Ehrenberg Bridge	4C	115.6		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Backwater A-10	4C	113.8		M.A. Singer et al.	11/71-10/72	GN(Nov-Mar) EF Mar-Oct			115
Palo Verde	4C	101.0-100.0	1	W.A. Dill	1942				35
Martinez Lake	4C	56.3		Zool. 414	2/14/1976		ASU		15

69. black crappie (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Imperial Reservoir	4C	49.2+	10	R.O. Weaver	9/3/69-10/31/70	Rt			148
Imperial Dam	5A	49.2		Keeler	1941	Ob			92
Imperial Dam	5A	49.2	1	W.A. Dill	1942				35
Haughtelin Lake	5B	40 - 30		W.A. Dill	1942				35
9 mi. so. of Morelos Dam	5C	13.1	3	R.R. Miller	3/22/1950				90
Hunters Hole	5C	2.4	2	W.L. Minckley	1974	netting			101
Hunters Hole	5C	2.4		LCRBR lab	9/21/74		ASU		15
1 mi. above Internat'l Boundary	5C	1		E. McClendon	10/20/1967		ASU		15

70. yellow perch
Perca flavescens

classification: non-native, bait fish
occurrence: lower Colorado River bait tanks, Topock, Arizona
rel. abundance: not established
date of intro.: 1951 from bait tanks
(Miller, 1952)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Shorty's Bait Shop, Topock, Az.	3C	233.9		R.D. Beland					88
Lower Colo. River	4A								99

71. walleye
Stizostedion vitreum vitreum

classification: non-native, game fish
occurrence: Lake Mead and tailwaters of Glen Canyon Dam (Stone, 1971; Minckley, 1973)
rel. abundance: rare (Stone, 1971)
date of intro.: rare in Lake Mead (Nevada Fish and Game, 1978); only avenue of migration from upstream impoundments (Bill Silvey, Arizona Game and Fish, pers. comm., 1979)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
tailwaters of Glen Canyon Dam	1A	688.6-716.4	1	AGF	7/1/71-6/30/72	GN			124
Lake Mead	2	342.2-412.3			1971-1972				97

72. convict ciclid (see narrative, no. 73)
Cichlasoma nigrofasciatum

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lake Mead	2	409.7-342.2		J. Deacon et al.	1964		UNLV	originally from Rogers Spring, flowing into Overton Arm	32
Lake Mead	2	368.0		W.L. Minckley J. Deacon et al.	12/7&8/1963		ASU		15

73. banded cichlid
Cichlasoma severum

classification: non-native, non-game fishes
occurrence: tributaries near Overton Arm, Lake Mead
rel. abundance: uncertain - small, established populations
date of intro.: 1950's as aquarium releases (Deacon et al., 1964)
museum coll.: UNLV, ASU

73. banded cichlid (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Overton Arm, Lake Mead	2	368.0		W.L. Minckley J. Deacon Zahorance et al.	Dec. 7&8/ 1963		ASU		15

74. Mozambique mouthbrooder
Tilapia mossambica

classification: non-native, non-game fish
occurrence: lower Colorado River, below Imperial Reservoir and in the drains around Yuma to the south (Minckley, 1969)
rel. abundance: uncertain
date of intro.: early 1960's; spread throughout canals and backwaters (Minckley, 1973)
museum coll.: ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
main outlet, Yuma desalting complex	4C	49.0			1973				132
Lower Colo. River	5A								99
Lower Colo. River	5B	37.3		LCRBR lab	6/18/ 1975		ASU		15
irrigation drain by Yuma & Imperial Co.	5B	30.8-28.6			1963				26
3 mi. east of Yuma, Yuma Valley	5B	ca 24		R. Lanse	1963-1966				114
Morelos Dam	5C	22.1		LCRBR lab	9/8/74		ASU		15
Lower Colo. River	5C	20.8		LCRBR lab	8/20/ 1974		ASU		
Lower Colo. River	5C	17.7		LCRBR lab	8/18/ 1974		ASU		15
Lower Colo. River	5C	15.1		LCRBR lab	8/13/ 1974		ASU		15

74. Mozambique mouthbrooder (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River	5C	6.5		LCRBR lab	8/19/ 1974		ASU		15
Lower Colo. River	5C	6.5		LCRBR lab	8/18/ 1974		ASU		15
Hunters Hole	5C	2.4	5	W.L. Minckley	1974	nets	ASU	"rarely found"	101
Lower Colo. River	5C	1.9		LCRBR lab	8/18/ 1974		ASU		15
1 mi. above Internat'l Boundary	5C	1.0		E. McClendon	10/21/ 1967		ASU		15
main drain pump station, ¼ mi. no. of US/Mex. brdr		.25		LCRBR lab	8/17/ 1974		ASU		15
Jct. Rt. 95& Co. Road 13		.25		E. McClendon	12/26/ 1965		ASU		15
Jct. Rt. 95& Co. Road 13		.25		E. McClendon	11/28/ 1965		ASU		15

75. Zilli's tilapia
Tilapia zilli

classification: non-native, non-game fish
occurrence: southern Arizona
rel. abundance: uncertain
date of intro.: uncertain; experimental introduction by personnel from University of Arizona (Minckley, 1973)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Lower Colo. River	4B								99
Lower Colo. River	5C								99

76. striped mullet
Mugil cephalus

classification: native, game fish
occurrence: lower Colorado River with Imperial Dam as upper limit (Minckley, 1969)
rel. abundance: can be quite abundant in the mainstream and lateral canals in that region (Minckley, 1973)
museum coll.: ASU

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Colorado River				Mohave Indians	prior to dams			"taken regularly by Mohave Indians"	146
Lower Colo. River	4B								99
Imperial Dam to Internat'l Bound.	5A-5C	49.2-0	ca 300	W.A. Dill	1/2/ & 5/ 1942	GN			35
Imperial Dam to Internat'l Bound.	5A-5C	49.2-0	c		1964				92
below Imperial Dam	5A	49.2			1969				101
below Imperial Dam	5A	49.2	38	D.W. Johnson	11/67-12/68				66
All American Canal	5A	48.7			1961				58
Laguna Dam to Yuma, Az.	5B	43.2-28.6		Mohave Indians	prior 1909	long & dip nets, Tr			122
½ mi. below Laguna Dam	5B	42.7		R.R. Miller	3/21/ 1950				90
RR bridge at Yuma	5B	30.5		R.R. Miller	3/21/ 1950				90
below Morelos Dam	5C	22.1	31	D.W. Johnson E. McClendon	1966	Sn	ASU		67

76. striped mullet (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
below Morelos Dam	5C	22.1		D.W. Johnson E. McClendon	3/19/ 1966		ASU		15
below Morelos Dam	5C	22.1		R.R. Miller	3/22/ 1950				90
below Morelos Dam	5C	22.1		E. McClendon	5/26/ 1967				15
Hunters Hole	5C	2.4		W.L. Minckley	1974	net	ASU		101
Hunters Hole	5C	2.4			1974	EF			101
Hunters Hole	5C	2.4		LCRBR lab	9/21/74		ASU		15

77. spotted sleeper
Eleotris picta

classification: marine species, native to Gulf of California
occurrence: Winterhaven, California to Yuma, Arizona, and the canal spillways (Miller and Lowe, 1964)
rel. abundance: sporadic, increasing salinities of the lower river may allow invasion of marine species upstream (Minckley, 1973)
museum coll.: CAS

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
canal spillway, Winterhaven, Cal.	5B	ca 31	1	C. Fox	1952	Ag	CAS		64
Yuma canal, Winterhaven	5B	ca 30.8			4/16/ 1952	Ag			92

78. longjaw mudsucker
Gillichthys mirabilis

classification: non-native, bait fish
occurrence: sporadically used as bait fish along lower Colorado River (Miller, 1952)
rel. abundance: limited, since it cannot reproduce in fresh water (Minckley, 1969)
date of intro.: uncertain, probably in 1950 as bait fish (Miller, 1952)

78. longjaw mudsucker (continued)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Needles, Cal.	3B	244.36		W.L. Minckley	1968	Ob			97
Kinders Camp	3C	182.0		R.R. Miller et al.	4/7/ 1950				88

79. Mottled sculpin - Bonneville mottled sculpin
Cottus bairdi

classification: non-native, bait fish
occurrence: lower Colorado River bait tanks - Las Vegas Wash and Lake Mead Boat Dock (Miller, 1952); incidental reportings near Davis Dam (Minckley, 1973)
rel. abundance: limited
date of intro.: 1950's as a bait fish (Miller, 1952)

Occurrence	Region	New River Mile	Abundance	Collector	Date	Method	Museum Collection	Other Information	Source No.
Las Vegas Wash	2	347.5		O.L. Wallis	4/6/ 1949			bait tanks	88
Lower Colo. River	3A								99
below Davis Dam	3B	276.0	1	W.L. Minckley	1971	Ob			97
Needles Boat Landing	3B	244.4	1	P.A. Douglas	1951	Ob		bait fish	88

FISHES OF THE COLORADO RIVER: 1970-1979

The following is a list of those fish species recorded in the lower Colorado River from the year 1970 to the present. The purpose of this list is to provide a general guideline to the fishes currently found in the Colorado River. The information in this list was taken from the distribution and abundance charts and from knowledgeable individuals.

FISHES OF THE COLORADO RIVER: 1970-1979

Species	Region											
	1A	1B	2	3A	3B	3C	4A	4B	4C	5A	5B	5C
tenpounder												x
threadfin shad		x	x	x	x	x	x	x	x	x	x	x
coho salmon		x										
cutthroat trout			x	x								
rainbow trout	x	x	x		x	x	x	x				
brown trout	x			x								
brook trout	x	x		x								
goldfish			x		x	x	x	x	x		x	x
carp	x	x	x	x	x	x	x	x	x	x	x	x
humpback chub	x	x										
bonytail chub		x		x	x							
roundtail chub	x	x	x		x				x		x	x
Virgin River spinedace		x										
golden shiner		x	x	x								
red shiner		x	x	x	x	x	x	x	x	x	x	x
fathead minnow		x	x	x				x				
Colorado River squawfish		x										
Utah sucker				x								
flannelmouth sucker	x	x	x	x	x					x	x	
white sucker				x								
bluehead sucker	x	x	x									
razorback sucker			x	x	x					x		
black bullhead		x	x		x	x			x	x	x	
yellow bullhead			x		x	x	x	x	x	x	x	x
channel catfish	x	x	x	x	x	x	x	x	x	x	x	x
flathead catfish							x		x	x	x	x
walking catfish										x		
Rio Grande killifish		x	x									
mosquitofish		x	x		x	x	x	x	x	x	x	x
sailfin molly									x	x	x	x
Mexican molly											x	x
striped bass			x		x	x	x	x	x			
green sunfish		x	x	x	x	x	x	x	x	x	x	x
warmouth									x		x	x
bluegill		x	x	x	x	x	x	x	x	x	x	x
redear sunfish					x	x	x	x	x	x	x	x
smallmouth bass					x			x	x			
largemouth bass		x	x	x	x	x	x	x	x	x	x	x
black crappie			x	x	x	x	x	x	x	x	x	x
walleye	x		x									
Mozambique mouthbrooder										x	x	x
Zilli's tilapia												x
striped mullett											x	x

STOCKING RECORDS

The following provides a chronological account of federal and state stocking activities in the lower Colorado River mainstem from circa 1880 to the present. Copies of the stocking files maintained by Willow Beach National Fish Hatchery, California Department of Fish and Game, and the Nevada Department of Fish and Game were obtained and used as sources, as were various official reports put out by these agencies and the stocking files of the Arizona Game and Fish Department. A complete list of sources is provided at the end of the following table.

In this report, stocking is considered by the aforementioned numerical regions. The accompanying map (Fig. 5) indicates which portion of the river a given numerical region covers.

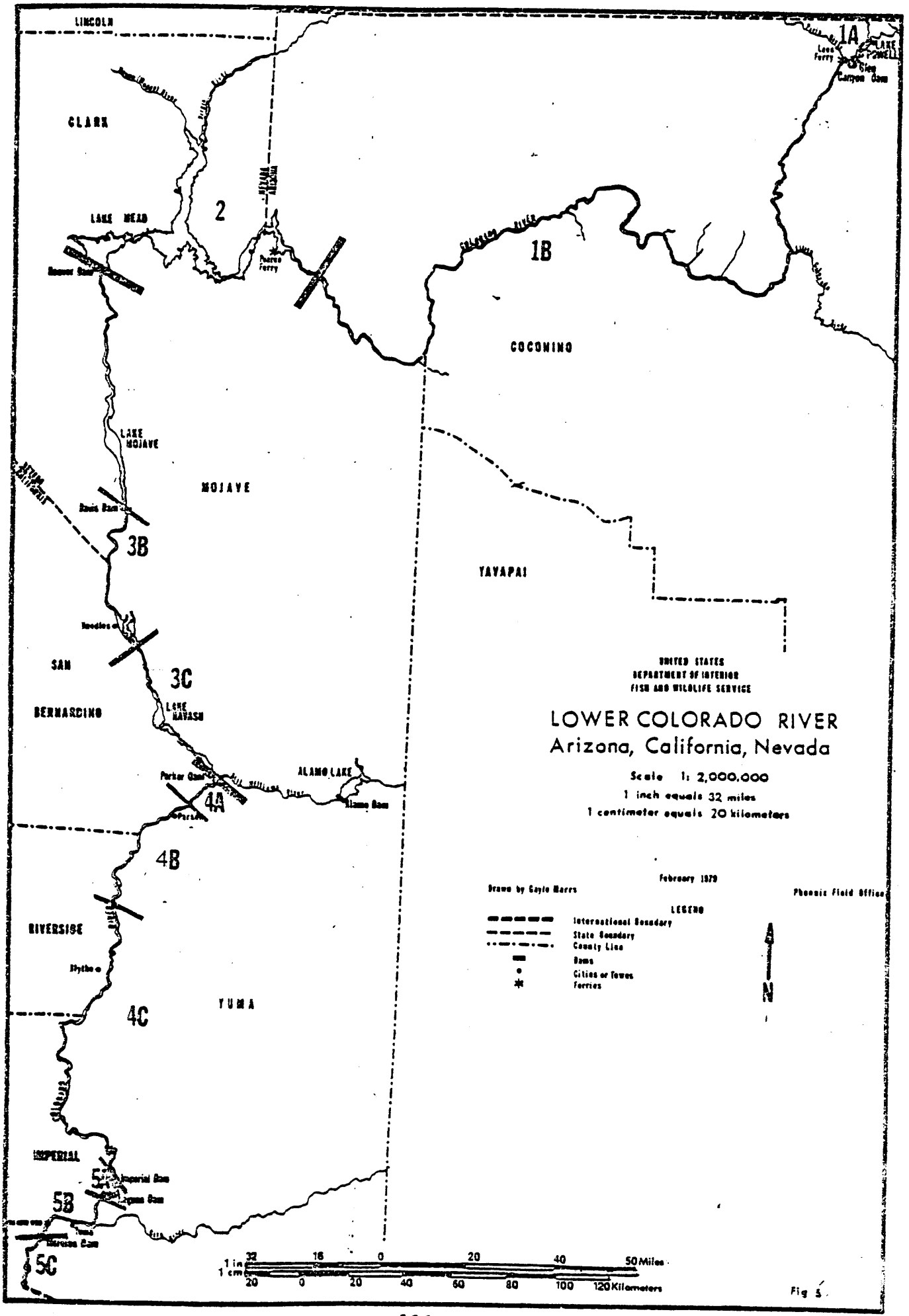

LINCOLN
CLARK
LAKE MEAD
2
1A
LAKE POWELL
1B
COCONINO
LAKE MOHAVE
MOJAVE
3B
YAVAPAI
SAN BERNARDINO
3C
LAKE HAVASU
ALAMO LAKE
4A
4B
RIVERSIDE
Blythe
YUMA
4C
IMPERIAL
5A
5B
5C
UNITED STATES
DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
LOWER COLORADO RIVER
Arizona, California, Nevada
Scale 1: 2,000,000
1 inch equals 32 miles
1 centimeter equals 20 kilometers
February 1979
Drawn by Gayle Morris
Phoenix Field Office
LEGEND
International Boundary
State Boundary
County Line
Dams
Cities or Towns
Ferries
N
1 in 32 16 0 20 40 50 Miles
1 cm 20 0 20 40 60 80 100 120 Kilometers

Fig 5

Year	Area	RT	Other Species	Agency	Source
ca. 1881-1891	2 ,3A 3B		Carp unknown number	USFC AFC	M & A
1884	3B		1,000,000 AS	USFC AFC	
1892-1893	3A		722 CC	AFC	BBS
1920	1B		5,000 BK	NPS	W & T
1922	1B	5,000(eggs)		USFS	W & T
1923	1B	20,000(fry)		NPS	W & T
1924	1B	6,000(fry)		NPS	W & T
1924	1B		50,000 BT (eggs)	NPS	W & T
1925	1B	50,000		NPS	W & T
1925	1B		CT	AGF	AGF files
1927	1B		10,000 BK (fry)	NPS	W & T
1927	1B		50,000 BK (eggs)	NPS	W & T
1930	1B	50,000(eggs)		NPS	W & T
1930	1B		100,000 BT (eggs)	NPS	W & T
1930	1B	50,000(eggs)		NPS	W & T
1930	1B		45,000 BT (eggs)	NPS	W & T
1931	1B		25,000 BK (eggs)	NPS	W & T
1931	1B	25,000(eggs)		NPS	W & T
1932	1B	25,000(eggs)		NPS	W & T
1935	2		14,625 LB	USFWS	J & S
1935	3A	50,000		USFWS	J & S
1936	5B (Yuma canals)		6,000 BG	AGF	AGFD files
1937	5B (Yuma canals)		13,500 BG	AGF	AGFD files
1937	5B (Yuma canals)		5,150 LB	AGF	AGFD files
1937	2		325,000 LB	USFWS	J & S
1937	2		25,000 BG	USFWS	J & S
1937	3A	50,000		USFWS	J & S
1938	3A	55,000		USFWS	J & S
1938	4C		500 CC	CFG	CFG files
1938	4C		20,000 BG	CFG	CFG files
1938	4C		24,000 LB	CFG	CFG files
1938	2		21,000 LB	USFWS	J & S

Year	Area	RT	Other Species	Agency	Source
1939	3C		4,500 BG	AGF	AGFD files
1939	3C		3,500 LB	AGF	AGFD files
1939	3B		5,000 LB	CFG	CFG files
1939	5B		12 LB	CFG	CFG files
1939	5B		12,000 BG	CFG	CFG files
1939	2		80,000-200,000 LB 1/	USFWS	J & S
1939	3A	25,000		USFWS	J & S
1940	3A	20,000		USFWS	J & S
1940	4A		30,000 LB	USFWS	J & S
1940	1B	50,000(fry)		AGF	AGFD files
1940	2		56,000 LB	USFWS	J & S
1940	2		18,000 BG	USFWS	J & S
1940	4A		100,000 GN	CFG	CFG files
1940	4A		7,000 CC	CFG	CFG files
1941	2		32,000 LB	USFWS	CFG files
1941	2		320,000 BG	USFWS	J & S
1941	3A	19,100		USFWS	Mo
1942	2		49,025 LB	USFWS	J & S
1942	2		12,145 BG	USFWS	J & S
1942	1B	30,000		AGFD	AGFD files
1942	3A	42,000		USFWS	J & S
1943	3A	20,000		USFWS	J & S
1944	3A	15,000		USFWS	J & S
1944	3A	35,000		NFG	J & S
(1944 Total	3A	= 50,0000			
1944	2	5,200		AGF	AGFD files
1945	3A	10,000-20,000		AGF	AGFD files J & S
1945	3A	100,000		NFG	J & S
1945	3A	20,000		USFWS	J & S
(1945 Total	3A	+ 130,000-140,000) 1/			
1945	5B		400 LB	AGF	AGFD files
1946	3A	10,000		AGF	AGFD files
1946	3A	0-106,144		NFG	J & S
1946	3A	20,000		USFWS	J & S
(1946 Total	3A	= 30,000-136,144)			
1947	3A	80,000		AGF	AGFD files
1947	3A	180,000		NFG	J & S
1947	3A	56,800		NFG	J & S
(1947 Total	3A	= 316,800)			

Year	Area	RT	Other Species	Agency	Source
1948	3C		68,634 LB	AGF	AGFD files
1948	4A		20,000 LB	AGF	AGFD files
1948	3A	105,000		AGF	AGFD files
1948	3A	100,000		NFG	J&S, NFG
1948	3A	185,100		USFWS	J & S
(1948 Total	3A	= 390,100)			
1948	1B	15,000		AGF	AGFD files
1948	3B	50,000		AGF	AGFD files
1949	3A	851,000		NFG	J&S, NFG
1949	3A	150,000		USFWS	J & S
(1949 Total	3A	= 1,000,000)			
1949	4A		20,000 LB	AGF	AGFD files
1949	4A		500 BG	AGF	AGFD files
1950	3A	253,000		USFWS	J & S
1950	3A	609,775-950,500		NFG	J&S, NFG
1950	3A	248,000		AGF	J&S, AGFD
(1950 Total	3A	= 1,110,775-1,451,500)[1/]			
1950	1B	50,400		AGF	AGFD files
1950	3B	88,000		AGF	AGFD files
1950	4C		8,000 GS	CFG	CFG files
1950	3B		8,000 GS	CFG	CFG files
1950	5B		26,400 RS	AGF	AGFD files
1950	4A		5,400 SB	CFG	CFG files
1951	3A	1,151,496		AGF	AGFD files
1951	3A	1,020,786		NFG	J&S, NFG
1951	3A	150,000		USFWS	J & S
(1951 Total	3A	= 2,322,282			
1951	4A		1,000 LB	CFG	CFG files
1951	3B		5,000 BG	CFG	CFG files
1952	3A	130,000		USFWS	J & S
1952	3A	774,478-894,420		NFG	NFG files
(1952 Total	3A	= 904,478-1,024,420)[1/]			J & S
1952	4C		43,200 SB	CFG	CFG files
1952	Colorado River	50,320		CFG	CFG files
1952	Colo. River	1,300,000		AGF	AGFD files
1953	3A	375,000-500,000		NGF	J&S, NFG
1953	3A	795,000		AGF	AGFD files
(1953 Total	3A	= 1,170,500-1,295,500[1/]			

Year	Area	RT	Other Species	Agency	Source
1953	3B	201,000		AGF	AGFD files
1953	3B	249,660		NFG	NFG files
(1953 Total	3B =	450,600)			
1953	4C		3,300 SB	CFG	CFG files
1954	2		274 TS	NFG	NFG files
1954	3A	21,624-23,418		NFG	NFG files, J & S
1954	3A	5,000		AGF	AGFD files
(1954 Total	3A =	26,624-28,418)[1/]			
1954	3B	52,895		NFG	NFG files
1954	3B	201,000		AGF	AGFD files
(1954 Total	3B =	253,895)			
1954	3B		274 TS	NFG	NFG files
1954	Colorado River	800,000		AGF	AGFD files
1955	2		11,376 TS	NFG	NFG files
1955	[redacted]		6,980 TS	NFG	NFG files
1955	[redacted]		2,000 PRS	NFG	NFG files
1955	3A	86,160-102,015[1/]		NFG	BBS, NFG files
1955	3A	2,000		AGF	AGFD files
(1955 Total	3A	88,160-104,015			
1955	3B	2,000		AGF	AGFD files
1955	3B		14,080 SB	CFG	CFG files
1955	3C		550 TS	CFG	CFG files
1955	4B		8,100 SB	CFG	CFG files
1955	4C		2,000 SB	CFG	CFG files
1956	[redacted]		15,000 PRS	NFG	NFG files
1956	3A	55,284-93,900		NFG	BBS, NFG files
1956	3A	168,103		AGF	AGFD files
(1956 Total	3A =	223,387-262,003[1/]			
1956	3B	494,668		NFG	NFG files
1956	3B	165,343		AGF	AGFD files
(1956 Total	3B =	660,011)			
1957	3A	12,406		AGF	AGFD files
1957	3A	23,404-84,277[1/]		NFG	BBS, NFG files
(1957 Total	3A =	35,810-96,683)			
1957	3B	34,204		NFG	NFG files
1957	3B	30,444		AGF	AGFD files
(1957 Total	3B =	64,648)			
1958	1B	51,000		AGF	AGFD files

Year	Area		RT	Other Species	Agency	Source
1958	3A		24,560		AGF	AGFD files
1958	3A		123,467-175,818		NFG	NFG files
(1958 Total	3A	=	148,027-200,387)[1/]			
1958	3B		61,984		NFG	NFG files
1958	3B		10,776		AGF	AGFD files
1958	3B		6,760		CFG	CFG files
(1958 Total	3B	=	79,520)			
1958	3C			350 FM	CFG	CFG files
1959	3A		33,615		AGF	AGFD files
1959	3A		180,837		NFG	NFG files
(1959 Total	3A	=	214,452-481,119)[1/]			
1959	3B		182,100		NFG	NFG files
1959	3B		12,140		CFG	CFG files
(1959 Total	3B	=	194,240)			
1959	3C		11,900		AGF	AGFD files
1959	4A		6,000		CFG	CFG files
1959	4C			1,590 ST	CFG	CFG files
1959	5B		2,000		AGF	AGFD files
1960	3A		59,000		AGF	AGFD files
1960	3A		64,655-164,160		NFG	NFG files
(1960 Total	3A	=	123,655-164,160)[1/]			
1960	3B		47,149		NFG	NFG files
1960	3B		133,490		AGF	AGFD files
(1960 Total	3B	=	180,639)			
1960	4A			100,800 BT	CFG	CFG files
1961	3A		54,970		AGF	AGFD files
1961	3A		14,330-34,022		NFG	BBS, NFG files
(1961 Total	3A	=	69,300-88,992)[1/]			
1961	3B		21,550		NFG	NFG files
1961	3B		14,100		CFG	CFG files
1961	3B		48,790		AGF	AGFD files
(1961 Total	3B	=	84,440)			
1961	4A		2,000		AGF	AGFD files
1961	4C			3,327 ST	CFG	CFG files
1962	3A			14,330 CT	NFG	BBS, NFG files
1962	3A		85,664-128,283		NFG	BBS, NFG files
1962	3A		26,100		AGF	AGFD files
(1962 Total	3A	=	111,764-128,283)[1/]			

Year	Area	RT	Other Species	Agency	Source
1962	3B	18,830		NFG	NFG files
1962	3B	12,555		CFG	CFG files
1962	3B	34,700		AGF	AGFD files
(1962 Total	3B =	66,085)			
1962	3B		40,025 ST	CFG	CFG files
1962	4B		3,700 CC		
1962	3A		100,000 KK	NFG	NFG files
1963	1B[2]	34,400		USFWS	WBNFH files
1963	3A	235,974		USFWS	WBNFH files
1963	3A	118,170		NFG	NFG files
(1963 Total	3A =	354,144-481,119)[1]			
1963	3B	4,970		NFG	NFG files
1963	3B	12,015		CFG	CFG files
1963	3B	90,800		USFWS	WBNFH files
(1963 Total	3B =	107,785)			
1963	3B		54,035 ST	USFWS	WBNFH files
1963	4C		7,441 ST	CFG	CFG files
1964	2		197,000 LB	NFG	NFG files
1964	3A	209,750-319,750 KK[1]		NFG	BBS, NFG files
1964	3A	74,571		NFG	NFG files
1964	3A	202,454		USFWS	WBNFH files
(1964 Total	3A	277,025-602,935)[1]			
1964	3B	91,950		USFWS	WBNFH files
1964	3B		311 ST	CFG	CFG files
1964	5A		17,125 BG	AGF	AGFD files
1964	3B, 3C, 4A or 4B	12,000[3]		CFG	CFG files
1965	1A	7,830		AGF	AGFD files
1965	2	2,550		USFWS	WBNFH files
1965	3A		99,000 KK	NFG	NFG files
1965	3A	38,890		NFG	NFG files
1965	3A	673,260		USFWS	WBNFH files
(1965 Total	3A =	712,150-1,353,130)[1]			BBS
1965	3B	195,260		USFWS	WBNFH files
1965	[redacted]		10,000 CC	AGF	AGFD files
1965	3B, 3C, 4A or 4B	14,000		CFG	CFG files
1966	1A	1,500		AGF	AGFD files
1966	3A		17,000 CT	NFG	NFG files
1966	3A	20,660		NFG	NFG files
1966	3A	418,229		USFWS	WBNFH files
(1966 Total	3A =	418,889-455,189)[1]			BBS

Year	Area	RT	Other Species	Agency	Source
1966	3B	187,479		USFWS	WBNFH files
1966	3B		10,000 CS	NFG	NFG files
1966	1	650		USFWS	WBNFH files
1966	5B	3,478		USFWS	WBNFH files
1966	3A & B	9,400		USFWS	WBNFH files
1966	4B & C	10,220		USFWS	WBNFH files
1966	3B, 3C, 4A or 4B	12,000		CFG	CFG files
1967	1	575		USFWS	WBNFH files
1967	3A	422,298		USFWS	WBNFH files
1967	3A	9,000		NFG	NFG files
(1967 Total	3A =	431,298)[1/]			
1967	3B	145,161		USFWS	WBNFH files
1967	3B	19,000		NFG	NFG files
(1967 Total	3B =	164,161)			
1967	3C		39 WT	CFG	CFG files
1967	5B	8,100		USFWS	WBNFH files
1967	4B & C	14,316		USFWS	WBNFH files
1967	3B, 3C, 4A or 4B	12,420		CFG	CFG files
1968	1A	2,493		USFWS	WBNFH files
1968	1A	8,300		AGFD	AGFD files
1968	[redacted]		30,074 CS	NFG	NFG files
1968	3A	49,678		NFG	NFG files
1968	3A	323,631		USFWS	BBS, WBNFH
(1968 Total	3A =	373,309-417,101)[1/]			BBS
1968	3B	113,181		USFWS	BBS
1968	3B		12,367 CC	AGF	AGFD files
1968	4A		36 WT	CFG	CFG files
1968	4C		5,670 CC	CFG	CFG files
1968	4C		32 WB	CFG	CFG files
1968	4B & C	18,320		CFG	CFG files
1969	1A	63,220		AGF	AGFD files
1969	2	39,997		AGF	AGFD files
1969	2	55,002		AGF	AGFD files
1969	2	41,650		NFG	NFG files
(1969 Total	2 =	80,117-158,219)[1/]			BBS
1969	3A	33,600		NFG	NFG files
1969	3A	418,202		USFWS	WBNFH files
(1969 Total	3A =	451,802)[1/]			BBS

Year	Area	RT	Other Species	Agency	Source
1969	2		10,000 ST	NFG	NFG files
1969	3B	139,480		USFWS	WBNFH files
1969	2		36,700 CS	AGF	AGFD files
1969	3A		15,000 CS	AGF	AGFD files
1969	4A		300 WB	CFG	CFG files
1969	4C		427 WB	CFG	CFG files
1969	4B & C	57,744		USFWS	WBNFH files
1969	3B, 3C, 4A or 4B	13,420[3/]		CFG	CFG files
1970	1A	24,375		AGF	AGFD files
1970	2		56,116 CS	NFG	NFG files
1970	2	154,000		NFG	NFG files
1970	3A	47,933		NFG	NFG files
1970	3A	277,762		USFWS	WBNFH files
(1970	Total 3A =	325,695-432,525)[1/]			BBS
1970	3A		34,320 CS	NFG	NFG files
1970	2		16,300 ST	NFG	NFG files
1970	3B	185,373		USFWS	WBNFH files
1970	4A		57 CC	CFG	CFG files
1970	4A		474 LB	CFG	CFG files
1970	4A		3 YB	CFG	CFG files
1970	4B & C	62,925		USFWS	WBNFH files
1970	3B, 3C, 4A or 4B	24,000[3/]		CFG	CFG files
1971	1A		20,000 CS	AGF	AGF files
1971	2		64,335 CS	AGF	AGFD files
1971	2		1,034 ST	NFG	NFG files
1971	2	13,643		NFG	NFG files
1971	2	54,535		AGF	AGFD files
(1971	Total 2 =	153,823-190,967)[1/]			BBS
1971	3A	322,743		USFWS	WBNFH files
1971	3A	29,407		NFG	NFG files
(1971	Total 3A =	360,000)			BBS
1971	3B	126,207		USFWS	WBNFH files
1971	4A		150 LB	CFG	CFG files
1971	4B & C	89,672		USFWS	WBNFH files
1971	3B, 3C, 4A or 4B	12,095[3/]		CFG	CFG files
1972	1A	4,585		AGF	AGFD files
1972	2		1,000 ST	AGF	AGFD files
1972	2		2,000 ST	NFG	BBS, NFG files
1972	2	(Total =	3,000 ST)	AGF	AGFD files
1972	2		169,000 CS	AGF	AGFD files
1972	2	146,392-180,486[1/]		NFG	BBS, NFG files

Year	Area	RT	Other Species	Agency	Source
1972	2		58,475 CT	NFG	NFG files
1972	3A	890,070		USFWS	WBNFH files
1972	3A	47,597		NFG	BBS, NFG files
(1972 Total 3A	=	180,486-937,667)[1/]			
1972	3B	68,786		USFWS	WBNFH files
1972	3B	20,400		CFG	CFG files
(1972 Total 3B	=	89,186)			
1972	3C		20,600 CC	CFG	CFG files
1972	4B & C	89,672		USFWS	WBNFH files
1972	4C		34,440 CC	CFG	CFG files
1972	5A		2,245 LB	AGF	AGFD files
1972	5B	6,000		USFWS	WBNFH files
1973	1A	3,675		AGF	AGFD files
1973	2	164,542-172,477[1/]		NFG	BBS, NFG files
1973	2	100,000 CS		AGF	AGF files
1973	3A	469,829-504,441[1/]		USFWS	WBNFH files
1973	3B	190,863		USFWS	WBNFH files
1973	3C		45,110 CC	CFG	CFG files

Year	Area	RT	CC	Other Species	Agency	Source
1973	4A		5,000		CFG	CFG files
1973	4B & C	28,000			USFWS	WBNFH files
1973	4C		96,805		CFG	CFG files
1973	5A		12,100		CFG	CFG files
1973	5B	7,500			USFWS	WBNFH files
1973	3B, 3C, 4A or 4B	47,700 [3]			CFG	CFG files
1974	2	249,857-254,240 [1]			NFG	BBS, NFG files
1974	3A	523,897-576,960 [1]			USFWS	WBNFH files
1974	3B		23,750		AGF	AGFD files
1974	3C		25,030		CFG	CFG files
1974	4A			3,410 RS	AGF	AGFD files
1974	4A			150 LB	CFG	CFG files
1974	4A		2,000		CFG	CFG files
1974	4C		56,510		CFG	CFG files
1974	5A			9,920 LB	AGF	AGFD files
1974	5A		3,803		CFG	CFG files
1974	5B		4,000		CFG	CFG files
1974	3B, 3C, 4A or 4B	29,960 [3]			CFG	CFG files
1975	2			28,908 BC	NFG	BBS, NFG files
1975	2	782,536-801,861 [1]			NFG	BBS, NFG files
1975	2			7,732 CT	NFG	NFG files
1975	3A	593,933-576,960 [1]			USFWS	WBNFH files
1975	3B		30,200		CFG	CFG files
1975	3C		96,500		CFG	CFG files
1975	4A		2,500		CFG	CFG files
1975	4A			2,000 RS	AGF	AGFD files
1975	4C			10,000 BR	AGF	AGFD files
1975	4C		187,200		CFG	CFG files
1975	5A		15,200		CFG	CFG files
1975	5B		8,000		CFG	CFG files
1975	3B, 3C, 4A or 4B	83,000 [3]				
1976	1A	100,000			AGF	AGFD files
1976	2	650,440			NFG	BBS, NFG files
1976	2			120,373 CT	NFG	NFG files
1976	3A	25,127			NFG	NFG files
1976	3A	576,960			USFWS	WBNFH files
(1976 Total 3A =		501,737-602,087 [1]				

Year	Area	RT	CC	Other Species	Agency	Source
1976	3A			10,138 CT	NFG	BBS, NFG files
1976	3B	100,100			AGF	AGF files
1976	3B		18,270		CFG	CFG files
1976	3C	37,450			CFG	CFG files
1976	4A		24,875		CFG	CFG files
1976	4C		200,246		CFG	CFG files
1976	5B		8,052		CFG	CFG files
1976	3B, 3C, 4A or 4B	78,250[3/]			CFG	CFG files
1977	1A	95,000			AGF	AGFD files
1977	1A			47,880 BK	AGF	AGFD files
1977	2			14,416-15,514[1/] CT	NFG	BBS, NFG files
1977	2			6,762-67,268[1/] BC	NFG	BBS, NFG files
1977	2	112,034-144,321			NFG	NFG files
1977	3A	516,960			USFWS	WBNFH files
1977	3A	153,927			NFG	BBS, NFG files
1977	(Total 3A =	730,887-896,651)[1/]				
1977	3A			10,135 CT	NFG	NFG files
1977	3B	150,000			AGF	AGFD files
1977	3C		20,580		CFG	CFG files
1977	3C			416 LB	CFG	CFG files
1977	4A		2,030		CFG	CFG files
1977	4A			200 LB	CFG	CFG files
1977	4C		58,040		CFG	CFG files
1977	4C			587 LB	CFG	CFG files
1977	5A		5,100		CFG	CFG files
1977	5A		51,910		AGF	AGFD files
1977	5B		5,400		CFG	CFG files
1977	Lower Colo. River		41,250		AGF	AGFD files
1977	3B, 3C, 4A or 4B	95,600[3/]			CFG	CFG files
1978	1B			60,000 CT	AGF	AGF files
1977	1B			BT	AGF	AGF files
1978	1B			100,000 BT	AGF	AGF files
1978	1A	50,000				
1978	3C			534 LB	CFG	CFG files
1978	3C		20,400			
1978	4A		900		CFG	CFG files
1978	4A			218 LB	CFG	CFG files
1978	4C		39,935		CFG	CFG files
1978	4C			201 LB	CFG	CFG files
19'8	3B, 3C, 4A or 4B	44,200[3/]			CFG	CFG files
?				5,000 BR	CFG	CFG files

KEY TO TABLE

Agency and Source Abbreviations

AFC — Arizona Fish Commission

AGF — Arizona Game and Fish Department

BBS — Baseline Biological Survey, Nevada Fish and Game Department (In press)

CFG — California Department of Fish and Game

J & S — Jonez and Sumner. 1953. Lakes Mead and Mohave Investigations. Nevada Department of Fish and Game. 186 pp.

M & A — Miller, R.R. and J.R. Alcorn. 1946. Amer. Fish. Soc. 73: 173-193.

Mo — Moffett, James W. 1942. Fisheries survey of the Colorado River below Boulder Dam. California Fish and Game. 28: 76-86.

NFG — Nevada Department of Fish and Game

NPS — National Park Service

USFC — U.S. Fish Commission

USFWS — U.S. Fish and Wildlife Service (including former Bureau of Sport Fisheries and Wildlife)

WBNFH — Willow Beach National Fish Hatchery

W & T — Williamson, R.R. and C.E. Tyler. 1924. Grand Canyon Nature Notes. 7(2): 11-15.

Species Abbreviations

AS	American shad	KK	Kokanee
BC	Bowcutt (rainbow x cutthroat)	LB	Largemouth bass
BG	Bluegill	PRS	Plains red shiner
BK	Brook trout	RS	Redear sunfish
BR	Black crappie	RT	Rainbow trout
BT	Brown trout	SB	Smallmouth bass
CC	Channel catfish	ST	Striped bass
CS	Coho salmon	TS	Threadfin shad
CT	Cutthroat trout	WB	White bass
FM	Fathead minnow	WT	White sturgeon
GN	Green sunfish	YB	Yellow bullhead
GS	Golden shiner		

Footnotes

1/ This total reflects discrepancies within the available information.

2/ The Grand Canyon was last stocked by the Arizona Game and Fish Department about this time. Since then, all Area 1 stocking has taken place in the vicinity of Lee's Ferry and Glen Canyon Dam.

3/ Locality given only to county in original data (San Bernardino County). These four areas are partially or wholly contained within San Bernardino County.

As the footnotes demonstrate, the stocking records and official reports used as sources were often contradictory and incomplete. For example, Jonez and Sumner state that Nevada planted 106,144 rainbow trout in Lake Mohave in 1946 while Nevada's stocking records list no such stocking.

Secondly, the Las Vegas and Springville National Fish Hatcheries, which stocked from the 1930's to the 1950's, were closed and their records have since been misplaced.

Lastly, as footnote 3 demonstrates, the records themselves frequently provide incomplete information. All too often a stocking location is given only to county or as "lower Colorado River." It is recommended that the Lower Colorado River Management Program Work Group develop a consistent method of recording stocking data and that a centralized office or agency maintain these stocking records.

ENDANGERED, THREATENED, AND UNIQUE SPECIES LISTS

The accompanying table lists those fishes that are currently under some form of federal or state concern. The various technical terms used to describe the status of the species, the levels of their protection, and management are defined below by agency. As of March 6, 1979, federal proposals to list Critical Habitat are withdrawn, pending supplemental information as required by the Endangered Species Act Amendments of 1978 (Federal Register, March 6, 1979 /44 FR 12382-12384/). Each proposed species must be provided with particular supplemental information by early November, after which time they will be withdrawn entirely and will require re-proposal.

Federal

Critical Habitat (taken from Federal Register, January 4, 1978 /43 FR 870-876/) "...means any air, land, or water area..., the loss of which would be appreciably decrease the likelihood of the survival and recovery of a listed species or a distinct segment of its population."

Endangered (taken from Endangered Species Act 1973; Sec. 3, No. 4): "The term 'endangered species' means any species which is in danger of extinction throughout all or a significant portion of its range."

Threatened (taken from Endangered Species Act, 1973; Sec. 3, No. 15): "The term 'threatened species' means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant part of its range."

California

According to At the Crossroads, California Fish and Game Department, 1976, a species is declared endangered if:

1. The species' mortality rate consistently exceeds its birthrate.
2. The species is incapable of adapting to environmental change.
3. The species' habitat is threatened by destruction or serious disturbance.
4. The species' survival is threatened by the unwanted introduction of other species through predation, competition, or disease.
5. Survival of the species is threatened by environmental pollution.

The same publication declared a species rare if:

1. The species is confined to a relatively small and specialized habitat and is incapable of adapting to different environmental conditions.

2. The species is nowhere abundant even if it is found in other parts of the world.

3. The species is so limited that any appreciable reduction in range members or habitat would cause it to become endangered.

4. The species would become endangered by any degree of diminished current management and protection programs.

Arizona (terms taken from Threatened and Unique Wildlife of Arizona, Arizona Game and Fish Comm., 1978)

Group I. Species or subspecies extirpated from Arizona that may possibly be re-established.

Group II. Species or subspecies in danger of being eliminated from Arizona.

Group III. Species or subspecies whose status in Arizona may be in jeopardy in the foreseeable future.

Group IV. Species or subspecies of special interest because of limited distribution in Arizona.

Nevada (terms taken from Classification of Wildlife, Nevada Fish and Game Commission, 1978)

Endangered - An endangered species or subspecies is one whose prospects of survival and reproduction are in immediate jeopardy. Its peril may result from one or many causes - loss of habitat or change in habitat, over-exploitation, predation, competition, disease. An endangered species must have help, or extinction will probably follow.

Rare - A rare species or subspecies is one that, although not presently threatened with extinction, is in such small numbers throughout its range that it may be endangered if its environment worsens. Close watch of its status is necessary.

TABLE 2. ENDANGERED, THREATENED, AND UNIQUE FISHES OF THE LOWER COLORADO RIVER

Species	Federal	Arizona	California	Nevada
Arizona trout *Salmo apache*	Threatened	Group III		
Humpback chub *Gila cypha*	Endangered	Group II		
Bonytail *Gila elegans*	Proposed endangered	Group II	Endangered	Rare
Roundtail chub *Gila robusta*	Proposed endangered (*Gila robusta seminuda*)	Group IV (*Gila robusta robusta*)		Endangered (*Gila robusta jordani*
Virgin River spinedace *Lepidomeda mollispini*		Group IV		Rare
White River spinedace *Lepidomeda albivallis*				Rare
Moapa dace *Moapa coriacea*				Rare
Woundfin *Plagopterus argentissimus*	Endangered	Group II		Rare
Colorado squawfish *Ptychocheilus lucius*	Endangered	Group II	Endangered	Endangered
Razorback sucker *Xyrauchen texanus*	Proposed threatened	Group III	Endangered	Rare
White River killifish *Crenichthys baileyi*				Rare
Desert pupfish *Cyprinodon macularius*		Group I		

MUSEUM COLLECTIONS OF COLORADO RIVER FISH

The institutions listed below have specimens of Colorado River fish in their reference collections. For each institution the mailing address and, if known, the approximate scope of its Colorado River holdings are noted. This list was compiled as an offshoot of the literature search on fish distribution and is intended as a preliminary directory.

1. Dr. W. L. Minckley
Curator of Ichthyology
Department of Zoology
Arizona State University
Tempe, Arizona 85281

An extensive collection of both introduced and endemic fishes. Maintains some of the Grand Canyon National Park's fish collection and specimens collected by the Arizona Game and Fish Department.

2. Curator of Ichthyology
California Academy of Sciences
Golden Gate Park
San Francisco, California 94118

Scattered holdings of specimens provided by the California Department of Fish and Game and various ichthyologists.

3. Fish Collection
Division of Interpretation
Grand Canyon National Park
Grand Canyon, Arizona 86023

Entire collection is on permanent loan to and is curated by various fish collections such as ASU, NAU, USNM, TU and UMMZ.

4. Dr. C. O. Minckley
Curator of Ichthyology
Museum of Northern Arizona
Flagstaff, Arizona 86001

Extensive holdings of endemic species collected by museum personnel on recent field surveys.

5. Curator of Ichthyology
Scripps Institution of Oceanography
La Jolla, California 92037

Contains specimens collected by the late Carl L. Hubbs.

6. Boulder National Recreation Area (Museum)
601 Nevada Highway
Boulder City, Nevada 89005

Contains specimens collected in the Lake Mead area.

7. U.S. National Fish and Wildlife Laboratory
Fort Collins, Colorado

8. Curator of Ichthyology
U. S. National Museum
Smithsonian Institution
Washington, D.C. 20560

Maintains specimens collected by earliest, nineteenth century, field ichthyological surveys.

9. Curator of Ichthyology
Department of Biological Sciences
Stanford University
Stanford, California 94305

Scattered holdings.

10. Dr. R.D. Suttkus, Director
Museum of Natural History
Tulane University
Belle Chasse, Louisiana 70037

Endemic and non-native species collected on recent field surveys.

11. Dr. R. R. Miller
Curator of Ichthyology
Museum of Zoology
University of Michigan
Ann Arbor, Michigan 48104

Extensive collection, especially endemic species, procured largely through R. R. Miller's field work.

12. Curator of Ichthyology
Department of Biological Sciences
University of Nevada, Las Vegas
4505 Maryland Parkway
Las Vegas, Nevada 89109

13. Curator of Ichthyology
Department of Biology
University of Utah
Salt Lake City, Utah 84112

14. Utah Cooperative Fishery Research Unit
Utah State University UMC 52
Logan, Utah 84322

15. University of Arizona Anthropology Department
Tucson, Arizona 85721

Some native fish remains collected at archaeological sites.

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