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Abstract:
Soon after coming to California in 1914, the senior author of this report began compiling the locality records of the freshwater fishes of the State with the ultimate object in view of preparing a distributional catalogue of the species that have been recorded from definite localities in California.

This work required a critical examination of all the literature pertaining to the freshwater fishes of the State, as species or kinds, in order that we might know not only what species are known to occur in California, but also the geographic distribution of each of those species within the State.

In the present publication we have given a Bibliography of all the papers of a faunistic character, that we have been able to consult dealing with the freshwater fishes of California. The titles in this Bibliography are arranged chronologically. Under each title is given a brief summary of what it contains relating to the subject in hand. Following the Bibliography is a Distributional List of all native species of freshwater fishes known to occur in California. This list is arranged systematically in accordance with the recently published Check-list of Fishes of North and Middle America by Jordan, Evermann & Clark.

Under each species are given all the definite localities from which it has been recorded, together with the authority for the record and the date of the record (which are usually in parenthesis), with the name under which recorded when that name is different from the present accepted name of the species.


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DIVISION OF FISH AND GAME OF CALIFORNIA
FISH BULLETIN No. 35
A Distributional List of the Species of Freshwater Fishes Known to Occur in California

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1. INTRODUCTION

Soon after coming to California in 1914, the senior author of this report began compiling the locality records of the freshwater fishes of the State with the ultimate object in view of preparing a distributional catalogue of the species that have been recorded from definite localities in California.

This work required a critical examination of all the literature pertaining to the freshwater fishes of the State, *as species or kinds*, in order that we might know not only what species are known to occur in California, but also the geographic distribution of each of those species within the State.

In the present publication we have given a Bibliography of all the papers of a faunistic character, that we have been able to consult dealing with the freshwater fishes of California. The titles in this Bibliography are arranged chronologically. Under each title is given a brief summary of what it contains relating to the subject in hand. Following the Bibliography is a Distributional List of all native species of freshwater fishes known to occur in California. This list is arranged systematically in accordance with the recently published Check-list of Fishes of North and Middle America by Jordan, Evermann & Clark.[1]

Under each species are given all the definite localities from which it has been recorded, together with the authority for the record and the date of the record (which are usually in parenthesis), with the name under which recorded when that name is different from the present accepted name of the species.

So far as we have been able to discover, the first reference to freshwater fishes in California is contained in a letter of Alzate y Ramyrez who wrote to the Royal Academy of Sciences at Paris in 1772, describing Cyprinodonts of California. The next reference that has come to our notice is in a book entitled "Oregon and California in 1848," by J. Quinn Thornton, published in 1849, in which there is said to be a reference to the fishes. We have not had access to these references, but as they evidently contain no recognizable descriptions of species, they may be said to belong to the prescientific period of history.

The scientific history of the study of freshwater fishes of California, if one makes time the measure, may be said to be brief. If it can be assigned a definite birthday, that would be May 18, 1854, when Dr. W. P. Gibbons read before a meeting of the *California Academy of Natural Sciences*, and had published in a newspaper, *The Daily Placer Times and Transcript*, a description of a remarkable fish, Hysterocarpus traski, the only freshwater member of the viviparous perch family, the locality being given as the lower Sacramento River.

From the beginning of the establishment of the *California Academy of Natural Sciences* (later the *California Academy of Sciences*), and the publishing of its Proceedings, beginning in September, 1854, and with the explorations of the Pacific Railway Survey, ichthyological investigation was very active. Most, if not all, of this pioneer work, by Ayres,

[1] Check-list of the Fishes and Fishlike Vertebrates of North and Middle America North of the Northern Boundary of Venezuela and Colombia; published February 8, 1930, in the Report of United States Commissioner of Fisheries for 1928, as Appendix, Part 2, Document No. 1055, pages 1–670, by David Starr Jordan, Barton Warren Evermann, and Howard Walton Clark.

Girard, Gibbons and others, consisted in descriptions of new species, both marine and freshwater. As might have been expected, the same species has often been described, either by different authors, or by the same author at different times under different names. To reduce these names to a common denominator, a task involving a careful comparison of descriptions, study of ascertained ranges, and all other available evidence, has been one of the principal aims of our studies which have resulted in this paper.

This pioneer work was based chiefly upon a study of specimens obtained in the San Francisco market, and did not involve much, if any, collecting in the streams and other waters of the State. Actual collecting in the field began with the various Pacific Railroad Exploring Expeditions in the early fifties, particularly the expeditions under Lieut. R. S. Williamson, Capt. J. W. Gunnison, and Lieut. A. W. Whipple. The collections made on these expeditions usually went to the United States Government or to the Academy of Natural Sciences of Philadelphia, and were studied and reported on chiefly by Dr. Charles Girard.

Not until the opening of Stanford University in 1891, and the coming to California of Dr. David Starr Jordan and Dr. Charles Henry Gilbert, did the fish fauna of the State receive any serious study. Following that date Doctors Jordan and Gilbert and many of their students in ichthyology were very active for more than twenty years studying the coastal waters and the streams and lakes of the State and collecting and studying the fishes found in them. In addition to Doctors Jordan and Gilbert among those who were especially active and who have contributed greatly to our knowledge of the freshwater fishes of California, special mention should be made of Cloudsley Rutter assisted by Fred M. Chamberlain, and Professors John O. Snyder and Edwin C. Starks.

2. BIBLIOGRAPHY

Following is a bibliography of all the papers of a faunal nature that we have been able to consult dealing with the systematics of the freshwater fishes of California. The titles are arranged in chronological order. When there are two or more papers in the same year by the same author, the second will have the letter a, the third one b, etc., added to the date.

Under each title we have given a brief summary of the contents of the paper, frequently giving a list of the species recorded therein, the water from which recorded, and the present identification of each species.

1854. Gibbons, W. P. Description of four new species of viviparous fish, read before the California Academy of Natural Sciences, Monday evening, May 15, 1854. Daily Placer Times and Transcript, May 18, 1854, p. 2, col. 3. : Describes the genus Hysterocarpus, with the species H. Traskii (= H. traski) with a variety A. of the same species, and three saltwater species.

1854a. Gibbons, W. P. Description of four new species of Viviparous Fishes from Sacramento River and the Bay of San Francisco. Proc. Acad. Nat. Sci. Phila., VII, 1854–55, pp. 105–106.: A republication, with slight changes, of the paper published in the Daily Placer Times and Tran-

described as new and what was in the first paper described as "Variety A" is here called "Var. B."

1854b. Gibbons, W. P. Description of New Species of Viviparous Marine and Freshwater Fishes from the Bay of San Francisco, and from the River and Lagoons of the Sacramento. Proc. Acad. Nat. Sci. Phila., VII, 1854–55, pp. 122–126.: Several new genera and species are described, among which is the genus Hysterocarpus, described previously (Gibbons 1854), Hysterocarpus traski is redescribed, the variation called "var. A" instead of "var. B," as on page 105.

1854. Girard, Charles. Descriptions of new Fishes collected by Dr. A. L. Heermann, Naturalist attached to the Survey of the Pacific Railroad Route, under Lieut. R. S. Williamson, U. S. A. Proc. Acad. Nat. Sci. Phila., VII, 1854–1855, pp. 129–140.: In this paper Girard lists 30 species, 29 of which are described as new. of the 30 species listed, 11 are freshwater forms.

1854a. Girard, Charles. Observations upon a collection of Fishes made on the Pacific coast of the United States, by Lieut. W. P. Trowbridge, U. S. A., for the Museum of the Smithsonian Institution. Proc. Acad. Nat. Sci. Phila., VII, 1854–1855 (August, 1854), pp. 142–156.: In his introduction to this paper, Dr. Girard says: "It is praiseworthy for officers of the government, whether military or civil, when detailed upon special duties, to devote their moments of leisure in serving the cause of science. Lieut. Trowbridge, while engaged under instructions from the U. S. Coast Survey, in making tidal observations for the use of that office, availed himself of such opportunities at his command to secure the fishes enumerated below, and we leave it to Naturalists to decide whether his labors were at all rewarded."

In this paper Girard lists 50 species, only one of which (Pogonichthys argyreiosus = Pogonichthys macrolepidotus), from the Presidio, on the Bay of San Francisco, is strictly freshwater, and another (Gasterosteus inopinatus, misprint for inornatus = Gasterosteus aculeatus), living in salt, brackish or fresh water, is reported from a freshwater lagoon near the Presidio.

1854. Ayres, W. O. New Fishes. Daily Placer Times and Transcript, May 30, 1854.: In this article, Dr. Ayres described as new five species of freshwater fishes, the descriptions being based on specimens obtained in the San Francisco market. The species are: Leuciscus gibbus (L. crassicauda), Leuciscus microlepidotus (Orthodon microlepidotus), Leuciscus gracilis (Ptychocheilus grandis), Leuciscus macrolepidotus (Pogonichthys macrolepidotus), and Catostomus occidentalis.

1854a. Ayres, W. O. New species of California Fishes. Proc. Boston Soc. Nat. Hist., V, 1854, pp. 94–103.: In this paper, Dr. Ayres described as new Centrarchus maculosus, now regarded as identical with the previously described Archoplites interruptus, the Sacramento Perch.

1854–1862. Ayres, Wm. O. Notes on California fishes with Descriptions of New Species. Proc. Calif. Acad. Nat. Sci., Vol. I, Part First, September 4, 1854–December 31, 1855, pp. 1–77 (1–83 of Reprint of December 31, 1873); Part 2d, Jan. 7, 1856—June 29, 1857, pp. 79–110 (84–125 of Reprint of December 31, 1873); continued in Vol. II, February 22, 1858–November 3, 1862, pp. i–xx+3–236.: Soon after the founding of the California Academy of Natural Sciences (April 4, 1853), regular weekly meetings began to be held, at which members presented papers or brief notes on various scientific subjects. Dr. William O. Ayres, one of the first, if not *the* first, to study systematically the fishes of California, at the regular weekly meetings of the Academy, presented numerous short papers describing species of fishes from California; some from salt water, some from fresh water. The earlier papers were first published in the *Daily Placer Times and Transcript* printed in San Francisco. Beginning with the meeting of September 4, 1854, publication was in the Proceedings of the California Academy of Natural Sciences, originally

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
129	Centrarchus *interruptus*	Archoplites interruptus	2345	Sacramento River
129	Cottopsis *gulosus*	Cottus gulosus	2996	San Joaquin River
133	Gasterosteus *williamsoni*	Gasterosteus aculeatus	1852	Williamson's Pass
133	Gasterosteus *microcephalus*	Gasterosteus aculeatus	1852	Tule Lake (San Joaquin Valley)
135	Gila *conocephala*	Mylopharodon conocephalus	798	Rio San Joaquin
136	Pogonichthys *inaequilobus*	Pogonichthys macrolepidotus	829	San Joaquin River
136	Pogonichthys *symmetricus*	Hesperoleucus symmetricus	863	Fort Miller, San Joaquin Valley
137	Lavinia *exilicauda*	Lavinia exilicauda	804	Sacramento River
137	Lavinia *crassicauda*	Siboma crassicauda	855	Rio San Joaquin
137	Lavinia *conformis*	Siboma conformis	856	Poso Creek, San Joaquin Basin
137	Leucosomus *occidentalis*	Lavinia exilicauda	804	Poso Creek and Four Creek

In the following table we have included all the freshwater species described or listed in Volumes I and II of the Proceedings.

In column 1 is given the date of the meeting at which the paper was presented; in column 2, the page (and plate if there is one) of the first edition of the Proceedings on which printed; in column 3, the page of the Reprint of November–December, 1873; in column 4, the species as recorded; in column 5, the present identification; in column 6, the number which the species bears in the Check-list of Fishes and Fishlike Vertebrates of North and Middle America north of the Northern Boundary of Venezuela and Colombia, by Jordan, Evermann & Clark, published February 8, 1930; and, finally in column 7, the locality from which the species was recorded. In all, 84 names are recorded of both salt and freshwater species, some of these names later reduced to synonyms. Twenty-three are fresh-water. New names are in *italics*.

1855. Gibbons, W. P. (in record of meeting). Proc. Calif. Acad. Nat. Sci., I, 1855, 35.: In an untitled record of the meeting of March 19, 1855, of the California Academy of Natural Sciences, Dr. Gibbons read a description of a new species of Trout, Salmo iridea (Salmo irideus) from San Leandro Creek.

1855. Agassiz, Louis. Synopsis of the ichthyological fauna of the Pacific slope of North America, chiefly from the collections made by the United States Exploring Expedition under the command of Capt. C. Wilkes, with recent additions and comparison with earlier types. Am. Jour. Sci. and Arts, 1855, pp. 71–99, and 215–231.: The author makes an extensive study of the genera of suckers and minnows. He notes only two of his species, Catostomus occidentalis and Ptychocheilus major, in the Sacramento-San Joaquin Basin, and both of these he described as new. Catostomus occidentalis, however, had but a few weeks previously been described under the same name by Ayres. Ptychocheilus major (p. 229) is the present P. grandis. Agassiz' specimens were collected by F. G. Cary, Jr.

1856. Girard, Charles. Researches upon the Cyprinoid Fishes inhabiting the fresh waters of the United States, West of the Mississippi Valley from specimens in the Museum of the Smithsonian Institution. Proc. Acad. Nat. Sci. Phila., VIII, 1856, pp. 165–213.: This paper by Dr. Girard was based upon collections obtained at different times and periods by several naturalists and surgeons attached to various surveys undertaken in 1851 to 1855 by the United States. These included the survey of routes for a railroad to the Pacific coast commenced in 1853, known as the Pacific Railroad Surveys. One of these parties, under Lt. R. S. Williamson, with Dr. A. L. Heermann as surgeon and naturalist, made a large collection of freshwater fishes in the valley of the San Joaquin River, and the Tulare Valley. Subsequently, the same officers explored the Sacramento Valley from San Francisco northward and on to Astoria, Ore. Dr. John S. Newberry was the naturalist and secured many interesting

Date of meeting	Original page, Vol. I	Reprint page, Part first	Species as recorded	Present indentification	J. E. & C. check-list No.	Locality
Sept. 18, 1854	7	38	Centrarchus *maculosus*	Archoplites interruptus	2345	Sacramento and San Joaquin rivers
Nov. 27, 1854	14	15	Acipenser *acutirostris*	Acipenser acutirostris	183	? "This vicinity"
Nov. 27, 1854	15	15	Acipenser *medirostris*	Acipenser acutirostris	183	"Our waters"
Nov. 27, 1854	16	15	Acipenser *brachyrhynchus*	Acipenser transmontanus	180	San Francisco Bay; San Pablo Bay; Suisun Bay; Lower Sacramento and San Joaquin rivers
Dec. 11, 1854	18	17	Catostomus *occidentalis*	Catostomus occidentalis	738	Sacramento and San Joaquin rivers
Dec. 11, 1854	17	17	Gila *grandis*	Ptychocheilus grandis	807	Not definite
Dec. 18, 1854	20	19	Lavinia *gibbosa*	Siboma crassicauda	855	Sacramento and San Joaquin rivers
Dec. 18, 1854	21	19	Lavinia *compressa*	Lavinia exilicauda	804	Sacramento and San Joaquin rivers
Dec. 25, 1854	21	20	Gila *microlepidota*	Orthodon microlepidotus	794	Sacramento and San Joaquin rivers
Feb. 5, 1855	28	27	Petromyzon *plumbeus*	Lampetra ayresii	18	Bay of San Francisco
Mar. 5, 1855	32	31	Catostomus *labiatus*	Catostomus occidentalis	738	Sacramento River at Stockton
Mar. 12, 1855	33	33	Mylopharodon *robustus*	Mylopharodon conocepnalus	798	San Joaquin River
April 16, 1855	43	42	Salmo *Rivularis*	Salmo irideus	357	Back of Martinez, toward the foot of Monte Diablo
April 16, 1855	44	43	Petromyzon *ciliatus*	Entosphenus ciliatus	17	Marshes of San Francisco Bay
April 30, 1855	47	46	Gasterosteus *serratus*	Gasterosteus aculeatus	1852	Marshes of the Bay of San Francisco
April 30, 1855	48	47	Gasterosteus williamsoni	Gasterosteus aculeatus	1852	Williamson's Pass
April 30, 1855	48	47	Gasterosteus microcephalus	Gasterosteus aculeatus	1852	Tulare Lake
April 30, 1855	48	47	Gasterosteus plebius	Gasterosteus aculeatus	1852	Marshes of San Francisco Bay
April 30, 1855	48	47	Gasterosteus inopinatus	Gasterosteus aculeatus	1852	Mountain Lake near San Francisco
	Vol. II					
Feb. 3, 1862	163	.....	Archoplites interruptus	Archoplites interruptus	2345	San Francisco Bay[1]
Feb. 3, 1862	163	.....	Catostomus occidentalis	Catostomus occidentalis	738	San Francisco Bay[1]
Feb. 3, 1862	163	.....	Catostomus labiatus	Catostomus occidentalis	738	San Francisco Bay[1]
Feb. 3, 1862	163	.....	Orthodon microlepidotus	Orthodon microlepidotus	794	San Francisco Bay[1]
Feb. 3, 1862	163	.....	Algansea formosa	Siphateles formosus	874	San Francisco Bay[1]
Feb. 3, 1862	163	.....	Lavinia compressa	Lavinia exilicauda	804	San Francisco Bay[1]
Feb. 3, 1862	163	.....	Ptychocheilus grandis	Ptychocheilus grandis	807	San Francisco Bay[1]
Feb. 3, 1862	163	.....	Mylopharodon robusta	Mylopharodon conocephalus	798	San Francisco Bay[1]

[1]All these 8 species of freshwater fishes common in San Francisco Bay in December and January 1861-2, following unusually heavy floods.

The following species of freshwater fishes were recorded in this paper by Dr. Girard from California localities:

Page	Plate	Species as recorded	Present identification	J. E. & C. check-list No.	Locality	Collector
169		Mylocheilus fratereulus	Mylocheilus fratereulus	797	Monterey	Lt. W. P. Trowbridge
169		Mylopharodon conocephalus	Mylopharodon conocephalus	798	San Joaquin River	Dr. Heermann
169		Mylopharodon robustus	Mylopharodon conocephalus	798	San Francisco	Dr. Newberry
174		Catostomus occidentalis	Catostomus occidentalis	738	San Francisco	Dr. Newberry
182		Orthodon microlepidotus	Orthodon microlepidotus	794	San Francisco	Dr. Newberry
183		Algansea formosa	Siphateles formosus	874	Mercede (Merced) River	Dr. A. L. Heermann
183		Algansea formosa	Siphateles mohavensis	877	Mohave River	Dr. A. L. Heermann
184		Lavinia exilicauda	Lavinia exilicauda	804	Sacramento River	Dr. A. L. Heermann
184		Lavinia harengus	Lavinia exilicauda	804	Monterey	A. S. Taylor
188		Pogonichthys inaequilobus	Pogonichthys macrolepidotus	829	San Joaquin River Petaluma	Dr. Heermann E. Samuels
188		Pogonichthys symmetricus	Hesperoleucus symmetricus	863	Fort Miller, San Joaquin Valley	Dr. Heermann
188		Pogonichthys argyreiosus	Pogonichthys macrolepidotus	829	Presidio near San Francisco	Lt. W. P. Trowbridge
206		Tigoma conformis	Siboma conformis	856	Poso Creek, San Joaquin Valley	Dr. A. L. Heermann
207		Tigoma crassa	Siboma crassicauda	855	Sacramento River near Fort Reading	Dr. John S. Newberry
208		Siboma crassicauda	Siboma crassicauda	855	San Joaquin, Mercede (Merced) and Mohave rivers	Dr. A. L. Heermann
209		Ptychocheilus grandis	Ptychocheilus grandis	807	San Francisco	Dr. Newberry
209		Ptychocheilus rapax	Ptychocheilus grandis	807	Monterey	Lt. W. P. Trowbridge

TABLE

1856a. Girard, Charles. Notice upon the genus Salmo, of authors, observed chiefly in Oregon and California. Proc. Acad. Nat. Sci. Phila., VIII, 1856, pp. 217–220.: of the 12 species mentioned, Dr. Girard records Salar iridea (Salmo irideus) from San Matteo (San Mateo) Creek and Petaluma, California.

Mention is made of receiving specimens obtained by Dr. Ayres, under the name Salmo rivularis, but the place of collection is not noted.

1857. Girard, Charles. Report upon Fishes collected on the Survey. Reports of Explorations and Surveys to ascertain the most practicable and economical Route for a Railroad from the Mississippi River to the Pacific Ocean, VI, 1857, no. 1 (of the zoological report—Explorations for a Railroad Route from the Sacramento Valley to the Columbia River by Lieut. R. S. Williamson), pp. 9–34, pls. 22a, 22b, 25a, 25b, 40a, 46, 62, 66, 68, 70, and 74.: In this report Girard records the following freshwater species from California:

Page	Plate	Species as recorded	Present identification	J. E. & C. check-list No.	Locality	Collector
9	II, figs. 1-4	Ambloplites interruptus	Archoplites interruptus	2315	Sacramento River	Dr. Newberry
10		Cottopsis gulosus	Cottus gulosus	2996	Upper Pit River	Dr. Newberry
11		Cottopsis parvus	Cottus gulosus	2996	Monterey; Presidio	Lt. Trowbridge
17		Gasterosteus inopinatus	Gasterosteus aculeatus	1852	Presidio	Lt. Trowbridge
26		Hysterocarpus traskii	Hysterocarpus traski	3252	Fort Reading	Dr. Newberry Dr. Hammond
27	XLVII	Mylopharodon robustus	Mylopharodon conocephalus	798	San Francisco	Dr. Newberry
28		Catostomus occidentalis	Catostomus occidentalis	738	San Francisco	Dr. Newberry
28	LIII, figs. 1-4	Orthodon microlepidotus	Orthodon microlepidotus	794	San Francisco	Dr. Newberry
29	LIV, figs. 1-4	Lavinia exilicauda	Lavinia exilicauda	804	San Joaquin River	Dr. Newberry
30	LXII	Tigoma crassa	Siboma crassicauda	855	Sacramento River	Dr. Newberry
31		Ptychocheilus grandis	Ptychocheilus grandis	807	San Francisco	Dr. Newberry
32	LXXI, figs. 1-4	Fario gairdneri	Salmo gairdneri	358	Klamath River	Dr. Newberry
33	LXXIV	Salar iridea	Salmo irideus	357	Chico Creek; San Francisco	Dr. Ayres
34		Acipenser acutirostris	Acipenser acutirostris	183	San Francisco	Dr. Newberry
34		Acipenser medirostris	Acipenser acutirostris	183	San Francisco	Dr. Newberry

TABLE

1858. Girard, Charles. General Report upon the Zoology of the Several Pacific Railroad Routes: Part IV, FISHES. Reports of Explorations and Surveys, to ascertain the most practicable and economical route for a Railroad from the Mississippi River to the Pacific Ocean, X, 1859, pp. 1–400, pls. 7, 8, 13, 14, 17, 18, 22, 26, 29, 30, 34, 37, 40, 41, 48, 53, 59, 61, 64, 65, 71.: In this General Report, Girard records the following

Page	Plate	Species as recorded	Present identification	J. E. & C. check-list No.	Locality	Collector
10	II, figs. 1-4	Ambloplites interruptus	Archoplites interruptus	2345	San Joaquin River	Dr. Heermann
					Sacramento River	Dr. Newberry
					San Francisco	Dr. Kennerly
54		Cottopsis parvus	Cottus gulosus	2996	Monterey	Lt. Trowbridge
					Presidio	Lt. Trowbridge
					Fort Reading	Dr. J. F. Hammond
					Petaluma	E. Samuels
86		Gasterosteus plebeius	Gasterosteus aculeatus	1852	San Francisco	Lt. Trowbridge
					San Francisco	Dr. Newberry
					San Jose	A. G. Grayson
					Petaluma	E. Samuels
90		Gasterosteus inopinatus	Gasterosteus aculeatus	1852	Presidio	Lt. Trowbridge
93		Gasterosteus williamsoni	Gasterosteus aculeatus	1852	Williamson's Pass	Dr. Heermann
190	XXVI, fig. 14	Hysterocarpus traskii	Hysterocarpus traski	3252	Fort Reading	Dr. Newberry
					Fort Reading	Dr. Hammond
216	XLVI, figs. 5-8	Mylopharodon conocephalus	Mylopharodon conocephalus	798	Rio San Joaquin	Dr. A. L. Heermann
216	XLVII	Mylopharodon robustus	Mylopharodon conocephalus	798	San Francisco	Dr. John S. Newberry
					San Francisco	Dr. W. O. Ayres
224		Catostomus occidentalis	Catostomus occidentalus	738	San Francisco	Dr. John S. Newberry
237	LIII, figs. 1-4	Orthodon microlepidotus	Orthodon microlepidotus	794	San Francisco	Dr. John S. Newberry
239		Algansea formosa	Siphateles formosus	874	Mercede (Merced) River	Dr. A. L. Heermann
					Mohave River	Dr. A. L. Heermann
241	LIV, figs. 1-4	Lavinia exilicauda	Lavinia exilicauda	804	Sacramento River	Dr. A. L. Heermann
					Poso Creek	Dr. A. L. Heermann
					San Joaquin River	Dr. John S. Newberry
242		Lavinia harengus	Lavinia exilicauda	804	Monterey Plains	A. S. Taylor, Esq.
245	LIV, figs. 1-4	Pogonichthys inaequilobus	Pogonichthys macrolepidotus	829	San Joaquin River	Dr. A. L. Heermann
					Petaluma	E. Samuels
					Sacramento River near Fort Reading	Dr. John S. Newberry
246		Pogonichthys symmetricus	Hesperoleucus symmetricus	863	Fort Miller, San Joaquin Valley	Dr. A. L. Heermann
246		Pogonichthys argyreiosus	Pogonichthys macrolepidotus	829	Presidio	Lt. W. P. Trowbridge
280		Luxilus occidentalis	Lavinia exilicauda	804	Poso, or O-co-ya Creek	Dr. A. L. Heermann
					Four Creeks, Tulare Valley	Dr. A. L. Heermann
289		Tigoma conformis	Siboma conformis	856	Poso or O-co-ya Creek, Tulare Valley	Dr. A. L. Heermann
293	LXII	Tigoma crassa	Siboma crassicauda	855	Sacramento River near Fort Reading	Dr. J. S. Newberry
296	LXIV, figs. 1-4	Siboma crassicauda	Siboma crassicauda	855	Rio San Joaquin	Dr. A. L. Heermann
299		Ptychocheilus grandis	Ptychocheilus grandis	807	San Francisco	Dr. John S. Newberry
					San Francisco	Dr. W. O. Ayres
300		Ptychocheilus rapax	Not in check-list=(Ptychocheilus grandis)	807	Monterey	Lt. Trowbridge
321	LXXIII, fig. 5	Salar iridea	Salmo irideus	357	Chico Creek	Dr. John S. Newberry
					San Francisco	Dr. W. O. Ayres
355	LXXIV	Acipenser acutirostris	Acipenser acutirostris	183	San Francisco	Dr. John S. Newberry
					San Francisco	Dr. W. O. Ayres
356		Acipenser medirostris	Acipenser acutirostris	183	San Francisco	Dr. John S. Newberry
377		Petromyzon tridentatus	Entosphenus tridentatus	16	Sacramento River	Dr. Hammond

1859. Girard, Charles. Report upon Fishes collected on the Survey. Reports of Explorations and Surveys to ascertain the most practicable and economical Route for a Railroad from the Mississippi River to the Pacific Ocean, X, 1859, no. 4 (of the Zoological Report—Explorations in California for Railroad Routes to Connect with the Routes near the 35th and 32d Parallels of North Latitude, by Lieut. R. S. Williamson), pp. 83–91, pls. 2, 12, 22, 27, 31, 38, 39, and 47.: In this report Girard lists 43 species, all but one (Pomoxis nitidus) from California localities; 14 of them are freshwater species:

Page	Plate	Species as recorded	Present identification	J. E. & C. check-list No.	Locality	Collector
83	II, figs. 1-4	Ambloplites interruptus	Archoplites interruptus	2345	San Joaquin River	Dr. A. L. Heermann
84		Cottopsis gulosus	Cottus gulosus	2996	San Joaquin River	Dr. A. L. Heermann
85		Gasterosteus microcephalus	Gasterosteus aculeatus	1852	Four Creeks, Tulare Valley	Dr. A. L. Heermann
86		Gasterosteus williamsoni	Gasterosteus aculeatus	1852	Williamson's Pass	Dr. A. L. Heermann
88		Mylopharodon robustus	Mylopharodon conocephalus	789	San Francisco	Dr. John S. Newberry
88	XLVI, fig. 508	Mylopharodon conocephalus	Mylopharodon conocephalus	789	San Joaquin River	Dr. A. L. Heermann
88		Algansea formosa	Siphateles formosus	874	Mercede (Merced) River	Dr. A. L. Heermann
89	LIV, figs. 1-4	Lavinia exilicauda	Lavinia exilicauda	804	Sacramento River	Dr. A. L. Heermann
					Poso Creek	Dr. A. L. Heermann
89	LVI, figs. 1-4	Pogonichthys inaequilobus	Pogonichthys macrolepidotus	829	San Joaquin River	Dr. A. L. Heermann
89		Pogonichthys symmetricus	Hesperoleucus symmetricus	863	Fort Miller, San Joaquin Valley	Dr. A. L. Heermann
89		Luxilus occidentalis	Lavinia exilicauda	804	Poso, or O-co-ya Creek	Dr. A. L. Heermann
					Four Creeks, Tulare Valley	Dr. A. L. Heermann
90		Tigoma conformis	Siboma conformis	856	Poso, or O-co-ya Creek	Dr. A. L. Heermann
90	LXII	Tigoma crassa	Siboma crassicauda	855	Sacramento River	Dr. John S. Newberry
90	LXIV, figs. 1-4	Siboma crassicauda	Siboma crassicauda	855	Rio San Joaquin	Dr. A. L. Heermann

TABLE

1859a. Girard, Charles. Report upon Fishes collected on the Survey. Reports of Explorations and Surveys, to ascertain the most practicable and economical Route for a Railroad from the Mississippi River to the Pacific Ocean, X, 1859, no. 4 (of the Zoological Report—Explorations near the 38th and 39th Parallels of North Latitude by Captain J. W. Gunnison), pp. 21–27, pls. 23, 49, 54, 56, 73, and 75.: In this paper Girard records 32 species of fishes, only five of which are freshwater species from California localities.

Page	Plate	Species as recorded	Present identification	J. E. & C. check-list No.	Locality	Collector
22		Algansea obesa	Siphateles obesus	872	Humboldt River	J. S. Bowman Mr. Kreuzfeld
23	LIV, figs. 1-4	Lavinia exilicauda	Lavinia exilicauda	804	Sacramento River	Dr. A. L. Heermann
23	LVI, figs. 1-4	Pogonichthys inaequilobus	Pogonichthys macrolepidotus	829	Sacramento River	Dr. A. L. Heermann
25		Tigoma humboldti	Chesmda humboldti	846	Humboldt River	J. S. Bowman
27	LXXIV	Salar iridea	Salmo irideus	357	Humboldt Bay	Lt. W. P. Trowbridge

TABLE

1859b. Girard, Charles. Report upon Fishes collected on the Survey. Reports of Explorations and Surveys, to ascertain the most practicable and economical Route for a Railroad from the Mississippi River to the Pacific Ocean, X, 1859, no. 5 (of the Zoological Report—Explorations near the 35th Parallel of North Latitude by Lieut. A. W. Whipple, assisted by Lieut. J. C. Ives), pp. 47–59, pls, 3, 4, 5, 6, 9, 10, 21, 24, 25, 35, 40, 52, 57, and 58.: In this paper Girard records 64 species of which only 13 are from California localities, and of these 13 only one is a fresh-water species, Ambloplites interruptus (Archoplites interruptus).

1859c. Girard, Charles. Ichthyological Notices. Proc. Acad. Nat. Sci. Phila., XI, 1859 (1860), pp. 157–161 (May 31).

Descriptions of fishes from various parts of the country, only one from California, Cyprinodon californiensis (C. macularius), from near San Diego, California.

1861. Agassiz, Alexander. Notes on the described species of Holconoti found on the western coast of North America. Proc. Boston Soc. Nat. Hist., VIII, 1861–62, pp. 122–133.: In this paper Hysterocarpus traski and Sargosomus fluviatilis (Hysterocarpus traski) are recorded from the Sacramento River.

1862. Gill, Theodore. Notes on some Genera of Fishes of Western North America. Proc. Acad. Nat. Sci. Phila., XIV, 1862, pp. 329–332.: This paper is merely a list of names without localities. An additional synonym of Entosphenus tridentatus (Entosphenus epihexodon) is given.

1868. Cooper, J. G. Some Recent Additions to the Fauna of California. Proc. Calif. Acad. Nat. Sci., IV, 1868, p. 3, and in The Natural Wealth of California by Titus Fey Cronise, p. 487, 1868.: In the first reference it is simply stated that the number of California species of fishes known is 196 in 1868, against 133 known in 1862. In the reference the bare names, without localities, of the 196 species are given, of which a considerable number of names has passed into synonymy; and there is a list with brief notes as to food value, mostly of marine species.

1870. Caton, John Dean. Trout Fishing in the Yosemite Valley. Am. Nat., III, 1870, pp. 519–522.: This paper records but one species, Salmo iridea Gibbons (Salmo henshawi) from the Merced River.

1873. Throckmorton, R. S. The first Shad (Alausa praestabilis = Alosa sapidissima) caught in California, and On the Introduction of exotic Food Fishes into the waters of California. Proc. Calif. Acad. Sci., V, pp. 85, and 86–88, May 5, 1873.: Records the first shad caught in the waters of California, which was presented to the Museum of the Academy, and gives the history of the introduction of 15,000 young fish transported from the Hudson, and placed in the Sacramento above Tehama, June 27, 1871. Whitefish were planted in Clear Lake, the date not given, but a large number had been brought across the continent, hatched, and about 25,000 planted. Apparently none survived.

1876. Gibbons, W. P. Description of a new species of Trout from Mendocino County. Proc. Calif. Acad. Sci., Ser. 1, VI, 1875 (1876), pp. 142–144.: In this paper Salmo mendocinensis (Salmo gairdneri) is described as new and recorded from streams of Mendocino County.

1878. Jordan, David S. and Henshaw, H. W. Report upon the Fishes collected during the years 1875, 1876, and 1877, in California and Nevada. Report of the Chief of Engineers, U. S. Army, for 1878, App. K. in App. NN., pp. 1609–1622, pls. I–IV.: In this report 34 species of fishes are

Page	Plate	Species as recorded	Present identification	J. E. & C. check-list No.	Locality	Collector
1609		Lampetra, sp. uncert.	Probably Entosphenus ciliatus	17	Goose Lake, Modoc County	H. W. Henshaw Sept., 1877
1610	I, III	Catostomus tahoensis	Catostomus tahoensis	751	Lake Tahoe; Eagle Lake	Dr. J. Cooper, H. W. Henshaw, 1876-1877
1610	III	Catostomus araeopus	Catostomus occidentalis	738	South Fork Kern River	H. W. Henshaw, 1877
1613		Apocope carringtoni	Apocope carringtoni	1053	Camp Bidwell, Modoc County; Spring near Smoke Creek, Lassen County	H. W. Henshaw, 1877
1613		Apocope vulnerata	Apocope carringtoni	1053	Horse Lake, Modoc County	Henshaw, July 9, 1877
1614		Apocope ventricosa	Apocope carringtoni	1053	Lake Tahoe; Shinn's Ranch, Modoc Co.	Henshaw, 1876-7
1614		Leucos obesus	Siphateles obesus	872	Lake Tahoe; Eagle Lake, Lassen County; Smoke Creek, Modoc County	Henshaw, 1876-7
1615		Leucos formosus	Siphateles formosus	874	Kern Lake	Henshaw
1615		Coregonus williamsoni	Prosopium williamsoni	420	Lake Tahoe; Truckee River; Trout Cr.	
1616		Salmo irideus	Salmo gilberti	357	Near Mount Whitney	H. W. Henshaw
1616		Salmo irideus	Salmo irideus	357	Ojai Creek, Ventura County	H. W. Henshaw
1618		Salmo tsuppitch	Salmo gibbsi	342	Tributary of Pit River, Modoc County; Lake Tahoe; Kern River	H. W. Henshaw 1875-1877
1619		Salmo *henshawi*	Salmo henshawi	343	Lake Tahoe	Henshaw
1619		Salmo *henshawi*	Salmo shasta	359	McCloud River	Livingston Stone
1620		Salmo pleuriticus	Salmo agua-bonita	364	South Fork of Kern River	Henshaw, 1875
1621		Ambloplites interruptus	Archoplites interruptus	2345	Kern Lake (probably an error)	Henshaw, 1875
1621		Uranidea gulosa	Cottus gulosus	2996	Jesse's Valley, Modoc County	Henshaw August 9, 1877

TABLE

1878. Jordan, David Starr. A synopsis of the Family Catostomidae. Bull. U. S. Nat. Mus., no. 12, pp. 97–237, 1878.: In this paper Dr. Jordan records the following species from California fresh waters:

Catostomus occidentalis from "Streams west of Rocky Mountains"; "brought to market in San Francisco and is said to be common in the Sacramento and San Joaquin rivers," and McCloud River; Catostomus araeopus Jordan, new species,

Kern River (Catostomus occidentalis); Pantosteus generosus, Mohave Desert, (Notolepidomyzon generosus); and Pantosteus plebeius, Basin of the Colorado River (Notolepidomyzon plebius).

1879. Lockington, W. N. Report upon the Food Fishes of San Francisco. Report Calif. Fish. Comm., 1878–79, pp. 17–58.: Discusses fishes of the markets, both salt and freshwater, from whatever locality derived. The following are the freshwater species mentioned:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
21	Archoplites interruptus (Sacramento River Perch)	Archoplites interruptus	2345	Sacramento River; Pajaro River; Clear Lake (on authority of Stone)
29	Hysterocarpus traskii	Hysterocarpus traski	3252	"Freshwaters of our State"
50	Gila grandis	Ptychocheilus grandis	807	Market, from freshwater
50	Pozoniehthys inaequilobus (Splittail)	Pozoniehthys macrolepidotus	829	Market in Spring, with other minnows or suckers
50	Catostomus occidentalis (Western Sucker)	Catostomus occidentalis	738	Market, from the Sacramento and its tributaries
50	Orthodon microlepidotus (Fan-tail)	Orthodon microlepidotus	794	Abundant, in markets
50	Siboma crassicauda (Thick-tail)	Siboma crassicauda	855	Occasional, in markets
50	Lavinia exilicauda	Lavinia exilicauda	804	Occasional, in markets
51	Acipenser brachyrhynchus (Sturgeon)	Acipenser transmontanus	180	Market, in abundance
51	Acipenser acutirostris (Long-nosed or Green Sturgeon)	Acipenser acutirostris	183	Abundant in the Bay and rivers and creeks flowing into it, not on the market, as fishermen regard it poisonous

TABLE

1880. Bean, Tarleton H. Check-list of duplicates of North American fishes distributed by the Smithsonian Institution in behalf of the United States National Museum, 1877–1880. Proc. U. S. Nat. Mus., III, 1880, pp. 75–116.: In this list Dr. Bean records specimens of three species of freshwater fishes from California, as follows:

Salmo irideus, Oncorhynchus quinnat (Oncorhynchus tschawytscha), and Salvelinus bairdii (Salvelinus malma spectabilis) from McCloud River.

1881. Jordan, David Starr and Gilbert, Chas. H. Notes on the Fishes of the Pacific Coast of the United States. Proc. U. S. Nat. Mus., IV, 1881, pp. 29–70.: This paper records the following species from California fresh waters:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
30	Ammocoetes plumbeus	Lampetra ayresi	18	San Francisco northward "doubtless ascends most of the coast streams in the spring"
30	Entosphenus tridentatus	Entosphenus tridentatus	16	Monterey Bay to Puget Sound, ascending the fresh waters to spawn
36	Acipenser transmontanus	Acipenser transmontanus	180	Sacramento River
38	Salvelinus malma	Salvelinus malma spectabilis	380	Lakes and streams of the Cascade Range from Mount Shasta northward to Alaska
38	Salmo irideus	Salmo irideus and Salmo shasta, each in part	357	From Mount Shasta to San Luis Rey River, in streams of the Coast Range and west slope of the Sierra Nevada, and McCloud River
38	Salmo gairdneri	Salmo gairdneri	358	Sacramento River
39	Oncorhynchus kisutch	Oncorhynchus kisutch	329	Sacramento River
39	Oncorhynchus chouicha	Oncorhynchus tschawytscha	331	Sacramento and Ventura rivers
40	Oncorhynchus keta	Oncorhynchus keta	328	All streams from San Francisco to Bering Straits
41	Oncorhynchus gorbuscha	Oncorhynchus gorbuscha	327	Sacramento River
51	Hysterocarpus traski	Hysterocarpus traski	3252	Sacramento and San Joaquin rivers, and streams southward to San Luis Obispo
69	Gasterosteus microcephalus	Gasterosteus aculeatus	1852	In rivers and brackish waters from Los Angeles River to Puget Sound
69	Gasterosteus aculeatus cataphractus	Gasterosteus aculeatus	1852	Rivers from San Francisco to Alaska

TABLE

1881a. Jordan, David Starr and Gilbert, Chas. H. Description of a new species of Ptychochilus (Ptychochilus harford), from Sacramento River. Proc. U. S. Nat. Mus., IV, 1881, pp. 72–73.: This paper records two species of freshwater fishes, as follows: Ptychochilus harfordi Jordan & Gilbert, new species, from the Sacramento River, and Ptychochilus oregonensis, also from the Sacramento River. (The present identification of these two nominal species is Ptychocheilus grandis.)

1881. Jordan, David Starr and Jouy, Piere L. Check-list of duplicates of fishes from the Pacific Coast of North America, distributed by the Smithsonian Institution in behalf of the United States National Museum. Proc. U. S. Nat. Mus., IV, pp. 1–18.: In this paper freshwater fishes are recorded from California localities as follows:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
5	Cottopsis gulosus	Cottus gulosus	2996	McCloud River
5	Cottopsis asper	Cottus asper	2997	Sacramento River
10	Hysterocarpus traski	Hysterocarpus traski	3252	Sacramento River
12	Archoplites interruptus	Archoplites interruptus	2345	Sacramento River
13	Cyprinodon californiensis	Cyprinodon macularius	1396	San Diego
14	Salmo purpuratus henshawi	Salmo henshawi	343	Lake Tahoe
14	Salmo irideus	Salmo irideus	357	San Luis Rey River; Sacramento River
14	Oncorhynchus kisutch	Oncorhynchus kisutch	329	Sacramento River
14	Oncorhynchus keta	Oncorhynchus keta	328	San Francisco
14	Oncorhynchus chouicha	Oncorhynchus tschawytscha	331	Sacramento River; Monterey
15	Orthodon microlepidotus	Orthodon microlepidotus	794	Sacramento River
15	Squalius gibbosus	Siboma crassicauda	855	Sacramento River
15	Ptychochilus oregonensis	Ptychocheilus grandis	807	Sacramento River
15	Ptychochilus harfordi	Ptychocheilus grandis	807	Sacramento River
16	Pogonichthys macrolepidotus	Pogonichthys macrolepidotus	829	Sacramento River
16	Mylopharodon conocephalus	Mylopharodon conocephalus	798	Sacramento River

TABLE

1882. Campbell, J. B. Notes on McCloud River, California, and some of its Fishes. Bull. U. S. Fish. Comm., I, 1881 (1882), pp. 44–46.: In this paper the following species are recorded: Riffle Pike, Whitefish (probably Ptychocheilus grandis), Dolly Varden or Swye-dar-deek-it (Salvelinus malma spectabilis), Sucker (Catostomus occidentalis), Red-sided Trout (Salmo shasta).

1883. Cope, Edward D. On the fishes of the Recent and Pliocene lakes of the Western part of the Great Basin, and of the Idaho Pliocene lake. Proc. Acad. Nat. Sci. Phila., XXXV, 1883, pp. 134–165.: In this paper the following species are recorded from California localities:

Species as recorded	Present identification	J. E. & C. check-list No.	Locality
Apocope ventricosa	Apocope carringtoni	1053	Small streams near Fort Bidwell
Apocope vulnerata	Apocope carringtoni	1053	Streams near Fort Bidwell
Leucus olivaceus	Siphateles olivaceus	871	Goose Lake

TABLE

1885. Jordan, David S. Identification of the Species of Cyprinidæ and Catostomidæ described by Dr. Charles Girard in the Proceedings of the Academy of Sciences of Philadelphia for 1856. Proc. U. S. Nat. Mus., VIII, 1885, 118–127.: A number of California species are included, but no localities given, the attempt being the discovery of the identities of the species in question by a comparison of types.

1888. Eigenmann, C. H. and R. S. Description of a new species of Cyprinodon. Proc. Calif. Acad. Sci., Ser. 2, I, 1888, p. 270.: Describes Cyprinodon nevadensis from a hot spring locally known as Saratoga Spring, in the south arm of Death Valley, Inyo County, California. Probably not different from Cyprinodon macularius.

1889. Eigenmann, C. H. and Eigenmann, R. S. Fishes of Aetna Springs, Napa County, California. West Am. Scientist, VI, 1889, p. 149.: The authors of this paper describe as a new species, Phoxinus clevelandi which is identical with Leuciscus egregius (Cheonda egregia). The specimens were collected by D. Cleveland. Associated with this they report Siphateles bicolor as Leucus bicolor. The locality is probably erroneous.

1889a. Eigenmann, C. H. and Eigenmann, R. S. Fishes of Allen Springs, Lake County, California. West Am. Scientist, VI, 1889, p. 149.: This paper records three species, viz: Ptychocheilus oregonensis (Ptychocheilus grandis), Salmo irideus, and Uranidea semiscabra centropleura, new species (Cottus gulosus).

1890. Eigenmann, Carl H. and Eigenmann, Rosa S. Additions to the Fauna of San Diego. Proc. Calif. Acad. Sci., 2d ser., III, 1890, pp. 1–24.: This paper describes as new, Phoxinus (Tigoma) orcuttii (Tigoma orcutti), from Temecula River, California.

1890. Eigenmann, Carl H. The Food Fishes of California fresh waters. Biennial Rept. Calif. Fish Comm. 1888–1890, pp. 53–65.: Gives a bare list of 47 species of freshwater fishes of California known at the time, including anadromous forms, a number of them now included in the synonymy of other names. The Klamath Lakes species are included also. The species for which localities are given are shown in the table below.

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
55	Acipenser transmontanus (White Sturgeon)	Acipenser transmontanus	180	Entering all large streams from the Sacramento to the Fraser River
55	Acipenser medirostris (Green Sturgeon)	Acipenser acutirostris	183	(San Francisco) markets
56	Catostomus areaopus (Kern River Sucker)	Catostomus occidentalis	738	Kern River (by implication)
56	Catostomus rex	Deltistes luxatus	764	Tule Lake; ascends Lost River, Oregon
56	Catostomus occidentalis	Catostomus occidentalis	738	Whole Sacramento Valley; Mare Island
56	Catostomus tahoensis (Tahoe Sucker; Redsided Sucker; Black Sucker)	Catostomus tahoensis	751	Truckee Basin; Rivers and rivulets tributary to lakes Tahoe and Donner in June
56	Chasmistes brevirostris	Chasmistes brevirostris	759	Klamath Lake
56	Chasmistes luxatus	Deltistes luxatus	764	Klamath Lake
57	Orthodon microlepidotus	Orthodon microlepidotus	794	Sacramento River
57	Lavinia exilicauda	Lavinia exilicauda	804	Sacramento River
57	Pogonichthys macrolepidotus	Pogonichthys macrolepidotus	829	No Locality; "one of the commonest of the minnows"
57	Mylopharodon conocephalus	Mylopharodon conocephalus	798	"San Francisco market, rare"
57	Ptychocheilus oregonensis	Ptychocheilus grandis	807	"Markets"
57	Ptychocheilus harfordi	Ptychocheilus grandis	807	"Markets"
58	Coregonus williamsoni	Prosopium williamsoni	420	Lake Tahoe
60	Oncorhynchus gorbuscha	Oncorhynchus gorbuscha	327	Sacramento River (only occasionally)
60	Oncorhynchus kisutch (Silver Salmon)	Oncorhynchus kisutch	329	Sacramento, in summer and fall
60	Oncorhynchus keta (Dog Salmon)	Oncorhynchus keta	328	"Said to be abundant in the fall, from Sacramento northward"
60	Oncorhynchus tschawytscha (Quinnat Salmon)	Oncorhynchus tschawytscha	331	Sacramento River. Young taken at Mare Island
61	Salmo gairdneri irideus (Brook Trout, Rainbow Trout)	Salmo irideus, in part; Salmo shasta, in part	357	All mountain streams west of the Sierra Nevada from Mount Shasta to Lower California
61	Salmo gairdneri (Steelhead)	Salmo gairdneri	358	From the Sacramento northward
63	Salmo purpuratus (Northern Trout)	Salmo irideus? (not mykiss)	357?	"From Mount Shasta northward." (Also from Sierra Madre, Mexico)
61–63	Salmo purpuratus henshawi (Lake Tahoe Trout)	Salmo henshawi	343	Lake Tahoe
64	Salvelinus malma	Salvelinus malma spectabilis	380	Northern California to Alaska
64	Archoplites interruptus (Sacramento Perch)	Archoplites interruptus	2345	Sacramento and San Joaquin Valleys
64	Hysterocarpus traski (Viviparous Perch)	Hysterocarpus traski	3252	Throughout the Sacramento Valley

1891. Eigenmann, C. H. and R. S. In Zoology [Notes]. Am. Nat., XXV, 1891, p. 1132.: Under the heading "Cottus beldingii," sp. nov., describes the species in question from Lake Tahoe, California, and records the following:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
1132	Cottus *beldingii*	Cottus beldingi	3004	Lake Tahoe
1132	Phoxinus montanus	Cheonda egregia?	812?	Lake Tahoe
1132	Agosia oscula	Apocope carringtoni?	1053?	Lake Tahoe
1132	Algansea obesa	Siphateles obesus	873	Lake Tahoe
1132	Coregonus williamsoni	Prosopium williamsoni	420	Lake Tahoe
1132	Catostomus tahoensis	Catostomus tahoensis	751	Lake Tahoe
1132	Salmo mykiss henshawi	Salmo henshawi	343	Lake Tahoe
1132	Algansea olivacea	Siphateles olivaceus	871	Donner Lake

TABLE

1892. Jordan, David Starr. A Description of the Golden Trout of the Kern River, California. Proc. U. S. Nat. Mus., XV, 1892, pp. 481–483.: In this paper Dr. Jordan described three small trout which he had received from Mr. W. H. Shockley of San Francisco to whom they had been sent by Mr. George T. Mills, State Fish Commissioner of Nevada, who had received them from Mr. A. C. Harvey of Lone Pine, Inyo County, California. The memorandum accompanying the specimens when they came into Dr. Jordan's hands, stated that they had been "taken by Mr. Harvey of Lone Pine, California, in a stream called by him 'Whitney Creek' (more correctly Volcano Creek), on the west side of the Sierras near Mount Whitney." Dr. Jordan regarded these specimens as representing a new and undescribed species which he named Salmo mykiss aguabonita.

It has since been learned that these specimens did not come from Whitney (or Volcano) Creek, but from Cottonwood Creek, a stream on the east side of the Sierras, and tributary to Owens Lake. Cottonwood Creek originally had no trout. It was first successfully stocked in 1876 (probably in July) by S. V. Stevens, A. C. Stevens, and Thomas George, with about 12 trout caught by them in a little stream, tributary to the South Fork of the Kern, in Mulky Meadow, about three and a half or four miles distant from the Tom Williams bridge, where the fish were liberated in Cottonwood Creek. The trout of Cottonwood Creek are therefore derived by transplanting from the South Fork of the Kern and are identical with the species found in that river rather than with that found in Volcano Creek, which is now recognized as a distinct species.[1]

1892. Eigenmann, C. H. and Ulrey, Albert B. A review of the Embiotocidæ. Bull. U. S. Fish Comm., XII, 1892, pp. 382–400.: This paper gives a complete synonymy of each species of the family and records Hysterocarpus traski from the Sacramento River.

1893. Gilbert, Charles H. Report on the Fishes of the Death Valley Expedition collected in southern California and Nevada in 1891, with Description of new Species. North American Fauna, no. 7, 1893 (May 31), pt. II, rpt. no. 3, pp. 229–234, pls. V–VI.: This paper records 13 species of fishes obtained by the Death Valley Expedition, two of them (Ameiurus nebulous and Cyprinus carpio) being introduced species, and only six

[1] For a full discussion of this subject see Evermann, the Golden Trout of the Southern High Sierras, in Bull. U. S. Bureau Fisheries, XXV, 1905 (May 19, 1906), pp. 23–38.

Page	Plate	Species as recorded	Present identification	J. E. & C. check-list No.	Locality	Collector
229		Ameiurus nebulous	Ameiurus nebulous	1164	Lone Pine on Owens River, introduced	
229		Catostomus araeopus	Catostomus occidentalis	738	Reese River, Nevada	Vernon Bailey
229	V, fig. 1	Rhinichthys (Apocope) velifer	Apocope velifera	1060	Hot Spring, Pahranagat Valley, Nevada	C. Hart Merriam and Vernon Bailey
230	VI, fig. 1	Rhinichthys (Apocope) nevadensis	Apocope nevadensis	1059	Warm Springs at Ash Meadow, Indian Creek and Vegas Creek, Nevada	
231		Rutilus symmetricus	Hesperoleucus symmetricus	863	Owens Lake	
231		Lepidomeda vittata	Lepidomeda vittata	1102	Pahranagat Valley, Nevada	
231		Cyprinus carpio	Cyprinus carpio		Owens River and Lake, Three Rivers, introduced	
231		Salmo irideus	Salmo whitei ?	365	Canon of Kings River	Dr. A. K. Fisher
232		Salmo mykiss agua-bonita	Salmo agua-bonita	364	Whitney Creek, South Fork of Kern River; Cottonwood Creek, introduced	
232		Cyprinodon macularius	Cyprinodon macularius	1396	Medbury Spring, Amargosa Desert, Nev., Saratoga Springs, Death Valley and Amargosa Creek	(May 25, 1891) C. Hart Merriam and Vernon Bailey
233		Cyprinodon macularius baileyi	Cyrpinodon baileyi	1398	Pahranagat Valley, Nevada	
234		Empetrichthys *merriami*	Empetrichthys merriami	1399	Ash Meadows, Amargosa Desert, on boundary between Cal. and Nev.; Ash Meadows and Pahrump Valley, Nev.	
234		Gasterosteus williamsoni	Gasterosteus aculeatus	1852	San Bernardino	Dr. A. K. Fisher and Miss Rosa Smith

1894. Jordan, David Starr. Description of a new subspecies of Trout from McCloud River, California. Proc. Acad. Nat. Sci. Phila., XLVI, 1894 (Jan. 30), p. 60.: A description of Salmo gairdneri stonei (Salmo stonei) allied to S. irideus, from McCloud River at Baird, California, known to the Indians as No-shee or Nissue.

1894a. Jordan, David Starr. Salmon and Trout of the Pacific Coast. Thirteenth Biennial Report, State Board of Fish Com. of Calif. for 1893, pp. 125–142, 8 figs.: In this paper Dr. Jordan discusses the salmon family as a whole, and gives localities only incidentally as follows: Oncorhynchus tschawytscha, Sacramento River; O. kisutch "sometimes taken in California" O. keta, "not often taken in California;" Salmo irideus; "every brook from the Mexican line northward to Mount Shasta;" S. gairdneri shasta (S. shasta), "the common trout of the upper Sacramento;" S. gairdneri stonei (S. stonei), McCloud and other tributaries of the upper Sacramento; S. gairdneri gilberti (S. gilberti), Kern River; S. gairdneri aguabonita (S. agua-bonita), upper tributaries of Kern River; S. gairdneri "common in the Sacramento, Klamath and Eel rivers and streams about Monterey;" S. mykiss (S. henshawi), Lake Tahoe and Feather River; Salvelinus malma (Salvelinus malma spectabilis) Upper Sacramento.

1894b. Jordan, David Starr. Descriptions of New Varieties of Trout. Thirteenth Biennial Report, State Board of Fish Com. of Calif. for 1893, pp. 142, 143, 3 figs.: Really a continuation and inseparable part of the preceding paper, but separated by a distinct title. Subspecies of which the distribution is given in that paper are described as new varieties here. These are the no-shee trout, called on p. 137 of the preceding article Salmo gairdneri stonei, here called Salmo irideus stonei, the Salmo stonei No. 360 of the Check-list, and there said to be perhaps a variant of Salmo shasta; the McCloud River trout or Shasta trout, Salma gairdneri shasta (S. shasta), and the Kern River trout, Salmo gairdneri gilberti (S. gilberti).

1894c. Jordan, David Starr. Notes on the Freshwater Fishes of San Luis Obispo County, California. Bull. U. S. Fish Comm., XIV, 1894, pp. 141–142.: On account of its isolated position very few species of fishes (only one freshwater species) have entered the streams of this county. In no other stream of the United States in which an equal amount of water flows, has so short a list been recorded. Three creeks, San Luis Creek, Corral de Piedra Creek and Arroyo Grande, are studied and described.

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
141 & 142	Agosia nubila	Apocope carringtoni	1053	San Luis Creek
141 & 142	Cottus gulosos	Cottus gulosus	2996	San Luis Creek
141 & 142	Eucyclogobius newberryi	Eucyclogobius newberryi	3573	San Luis Creek
141 & 142	Gasterosteus microcephalus	Gasterosteus aculeatus	1852	San Luis Creek
142	Salmo mykiss gairdneri	Salmo gairdneri	358	Lopez Creek
142	Salmo mykiss irideus	Salmo irideus	357	Lopez Creek
142	Oncorhynchus tschawytscha	Oncorhynchus tschawytscha	331	Lopez Creek

TABLE

1894. Jordan, David Starr and Gilbert, Chas. H. List of the fishes inhabiting Clear Lake, California. Bull. U. S. Fish Comm., XIV, 1894, pp. 139–140.: Specimens of the fishes described here were collected by the authors, and by Mr. Sanford Parrish, of Lakeport. The list is as follows:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
139	Entosphenus tridentatus	Entosphenus tridentatus	16	Clear Lake
139	Catostomus occidentalis	Catostomus occidentalis	738	Clear Lake
139	Lavinia exilicauda	Lavinia exilicauda	804	Clear Lake
139	Orthodon microlepidotus	Orthodon microlepidotus	794	Clear Lake
139	Leuciscus crassicauda	Siboma crassicauda	855	Clear Lake
139	Ptychocheilus oregonensis	Ptychocheilus grandis	807	Clear Lake and Kelsey Creek
139	Pogonichthys macrolepidotus	Pogonichthys macrolepidotus	829	Clear Lake
139	Salmo mykiss irideus	Salmo irideus	357	Clear Lake
140	Gasterosteus microcephalus	Gasterosteus aculeatus	1852	Clear Lake
140	Archoplites interruptus	Archoplites interruptus	2345	Clear Lake
140	Cottus gulosus	Cottus gulosus	2996	Clear Lake
140	Hysterocarpus traski	Hyste-ocarpus traski	3252	Clear Lake
140	Cyprinus carpio	Cyprinus carpio		Clear L., introduced
140	Ameiurus nebulosus	Ameiurus nebulosus	1164	Clear L., introduced
140	Ameiurus catus	Haustor catus	1156	Clear L., introduced
140	Micropterus dolomieu	Micropterus dolomieu	2315	Clear L., introduced

TABLE

1896. Jordan, David Starr. Notes on fishes, little known or new to Science. Proc. Calif. Acad. Sci., 2d ser., VI, 1896, pp. 201–244.: In this paper Dr. Jordan records but one species from California fresh waters: Cottus shasta Jordan & Starks, a new species from McCloud River at Baird, Shasta County.

1896–1900. Jordan, David Starr, and Evermann, Barton Warren. The Fishes of North and Middle America : A Descriptive Catalogue of the Species of Fish-like Vertebrates found in the waters of North America north of the Isthmus of Panama. U. S. Nat. Mus., Bull. 47; Part I, pp. I to LX+1 to 1240, Branchiostomidæ to Lobotidæ; published Oct. 3, 1896; Part II, pp. I to XXX+1241 to 2183; Lutianidæ to Cephalacanthidæ; published Oct. 3, 1898; Part III, pp. I to XXIV+2183a to 3136; Callionymidæ to Ogcocephalidæ and Addenda, published Nov. 26, 1898; Part IV, pp. I to CI+3137 to 3313, pls. I to CCCXCII; published June, 1900.: * * * * * * *

In this monumental work only a few freshwater species were recorded from definite California localities. They are listed in the following table:

Part	Page	Serial No. of species	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
I	12	11	Entosphenus tridentatus	Entosphenus tridentatus	16	Santa Ana River, Riverside
I	178	286	Catostomus occidentalis	Catostomus occidentalis	738	Sacramento and San Joaquin rivers
I	207	330	Orthodon microlepidotus	Orthodon microlepidotus	794	Sacramento and San Joaquin rivers
I	209	333	Lavinia exilicauda	Lavinia exilicauda	804	Clear Lake
I	219	351	Mylopharodon conocephalus	Mylopharodon conocephalus	798	Sacramento and San Joaquin rivers
I	223	356	Pogonichthys macrolepidotus	Pogonichthys macrolepidotus	829	Sacramento and San Joaquin rivers
I	224	357	Ptychocheilus oregonensis	Ptychocheilus grandis	806	Sacramento, San Joaquin and Salinas rivers
I	225	358	Ptychocheilus harfordi	Ptychocheilus grandis	807	Lower Sacramento River
I	231	363	Leuciscus crassicauda	Siloma crassicauda	855	Sacramento and San Joaquin rivers
I	231	364	Leuciscus conformis	Siboma conformis	856	Poso Creek, Tulare County
I	237	374	Leuciscus egregius	Cheonda egregia	842	Lake Tahoe and Truckee River
I	241	381	Leuciscus orcutti	Tigoma orcutti	854	Rio San Luis Rey, Rio San Jacinto, and Santa Ana rivers
I	245	387	Rutilus symmetricus	Hesperoleucus symmetricus	863	Tres Pinos Creek; San Joaquin and Merced rivers; Kern Lake and Salinas River
I	247	389	Luxilinus occidentalis	Lavinia exilicauda	804	San Joaquin Valley
I	318	526	Hybopsis cumingii	Oregonichthys cumingi	1032	"California"
I	478	773	Oncorhynchus gorbuscha	Oncorhynchus gorbuscha	327	Sacramento, occasionally
I	478	774	Oncorhynchus keta	Oncorhynchus keta	328	San Francisco (to Kamchatka)
I	479	775	Oncorhynchus tschawytscha	Oncorhynchus tschawytscha	331	Sacramento and Ventura rivers
I	480	776	Oncorhynchus kisutch	Oncorhynchus kisutch	329	San Francisco, northward to Kamchatka and Japan
I	493	779a	Salmo mykiss henshawi	Salmo henshawi	343	Tahoe, Donner and Independence lakes; Truckee and Feather rivers
I	500	787	Salmo irideus	Salmo gairdneri	357	Klamath and San Luis Rey rivers; Purisima Creek
I	502	781b	Salmo irideus shasta	Salmo shasta	359	McCloud River
I	502	781c	Salmo irideus gilberti	Salmo gilberti	362	South Fork of Kern River at Soda Springs below the falls
I	503	781d	Salmo irideus stonei	Salmo stonei	360	McCloud River, 8 miles above Baird
I	503	781e	Salmo irideus agua-bonita	Salmo agua-bonita	361	South Fork of Kern River; streams about Owens Lake; Volcano Creek (by error)
I	507	784	Salvelinus malma	Salvelinus malma spectabilis	380	Upper Sacramento River
I	667	980	Empetrichthys merriami	Empetrichthys merriami	1399	Amargosa Desert
I	674	988	Cyprinodon macularius	Cyprinodon macularius	1396	Springs in San Diego County; Saratoga Springs, Inyo County
	750	1101	Gasterosteus williamsoni	Gasterosteus aculeatus	1852	Santa Ana River at Colton; Williamson's Pass, San Bernardino
I	751	1101a	Gasterosteus williamsoni microcephalus	Gasterosteus aculeatus	1852	Four Creek (Kaweah River); San Gregorio Creek, Pilarcitos Creek, etc.
I	991	1386	Archoplites interruptus	Archoplites interruptus	2345	Sacramento and San Joaquin rivers and tributary lakes
II	1496	1879	Hysterocarpus traski	Hysterocarpus traski	3252	Rivers of Central California
II	1944	2315	Cottus gulosus	Cottus gulosus	2996	Streams of the Coast Range in California, south to Point Concepcion; San Francisquito Creek
II	1947	2318	Cottus shasta	Cottus shasta	3000	McCloud River at Baird
II	1958	2330	Cottus beldingii	Cottus beldingi	3004	Lake Tahoe; Donner Lake
III	2248	2580	Eucyclogobius newberryi	Eucyclogobius newberryi	3573	Streams of California; small clear brooks near the sea; San Luis Obispo Creek
III	2870	780d	Salmo clarkii tahoensis	Salmo tahoensis	344	Lake Tahoe

1903. Rutter, Cloudsley. Notes on Fishes from Streams and Lakes of Northeastern California not tributary to the Sacramento Basin. Bull. U. S. Fish Comm., XXII, for 1902 (March 31, 1903), pp. 143–148, with 2 text figs.: This short paper was based upon collections made in Grasshopper, Eagle and Honey lake basins in 1898, by Cloudsley Rutter and Fred M. Chamberlain, and in the Truckee River basin in 1899, by Rutter and W. S. Atkinson.

Grasshopper Lake was described by Rutter as an alkaline pond without outlet, at the southern end of Grasshopper plains in Lassen County, and containing no fish. One species of minnow was found to be abundant in a spring emptying into the pond.

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
146	Pantosteus *lahonton*	Pantosteus lahontan	735	Susan River, Little Truckee River and Prosser Creek
147	Catostomus tahoensis	Catostomus tahoensis	751	Willow Creek, Susan River, Little Truckee River and Prosser Creek
147	Chasmistes *chamberlaini*	Catostomus tahoensis	751	Eagle Lake (type locality)
147	Leuciscus egregius	Cheonda egregia	842	Willow Creek and Susan River
147	Rutilus olivaceus	Siphateles olivaceus	871	Eagle Lake and Willow Creek
148	Agosia *robusta*	Apocope robusta	1052	Prosser Creek (type locality), Spring Creek, Willow Creek, Susan and Little Truckee rivers
148	Coregonus williamsoni	Prosopium williamsoni	420	Truckee River—Probably this reported from Bigler (Tahoe) and Donner lakes
148	Salmo henshawi	Salmo henshawi	343	Little Truckee River, Sage Hen Creek and Prosser Creek
148	Salmo irideus	(Mis-identification; should have been S. *henshawi*)	343	Susan River and Prosser Creek. "Introduced into Truckee Basin; possibly Honey Lake Basin"
148	Salvelinus fontinalis	Salvelinus fontinalis	371	Prosser Creek; introduced
148	Cottus beldingii	Cottus beldingii	3004	Susan River, Little Truckee River, Sage Hen Creek and Prosser Creek

TABLE

Eagle Lake also is without outlet. Only two species of fishes were obtained from it.

Honey Lake also has no outlet, but has two tributary streams—Willow Creek which was fished about 15 miles north of Susanville, where it passes through an extensive meadow, and Susan River which was examined in its lower course. Four species were found in this basin.

In the Truckee Basin the following waters were examined: Little Truckee River which drains Webber and Independence lakes and which was fished a short distance below Independence Lake; Sage Hen Creek, a small tributary of the Little Truckee; and Prosser Creek, a tributary of the Truckee River, was fished near Prosser Bar. Eight species were recorded from these waters.

1905. Snyder, John Otterbein. Notes on the Fishes of the streams flowing into San Francisco Bay. Report, U. S. Bur. Fish. for 1904 (July 14, 1905), 327–338, with 1 map.:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
331	Entosphenus tridentatus	Entosphenus tridentatus	16	Coyote Creek
331	Catostomus occidentalis	Catostomus occidentalis	738	San Francisquito, Madera, San Antonio, Stevens, Campbell, Guadalupe, Coyote, Alameda, Arroyo Honda, Smith and Isabel creeks; disappears at time of drought and returns
331	Orthodon microlepidotus	Orthodon microlepidotus	794	Coyote Creek
331	Lavinia exilicauda	Lavinia exilicauda	804	Coyote and Alameda creeks
331	Pogoniehthys macrolepidotus	Pogoniehthys macrolepidotus	829	Coyote Creek
331	Ptychocheilus grandis	Ptychocheilus grandis	807	San Francisquito, Coyote and Alameda creeks
332	Leuciscus crassicauda	Siboma crassicauda	855	Coyote Creek
332	Rutilus symmetricus	Hesperoleucus symmetricus	863	San Francisquito, Madera, San Antonio, Campbell, Guadalupe, Coyote, Alameda, Arroyo Honda and Isabel creeks. Not in Stevens Creek; maintains itself in Madera Creek during periods of drought when nothing remains of the stream but a few small disconnected pools

TABLE

1906. Evermann, Barton Warren. The Golden Trout of the Southern High Sierras. Bull. U. S. Bur. Fish., XXV, 1905 (May 19, 1906), pp. 1–51, pls. I–XVII, 1 map, 39 text figs.: This paper is a report on an expedition, led by the author, into the Mount Whitney region of the Southern High Sierras in 1904, for the purpose of studying the fishes found there, particularly the Golden Trout of Volcano Creek. The investigation was ordered by President Roosevelt at the suggestion of Stewart Edward White.

The species recorded are as follows: (see table on p. 30).

1907. Juday, Chancey. Notes on Lake Tahoe, its Trout and Trout-fishing. Bull. U. S. Bur. Fish., XXVI, 1906 (May 11, 1907), Doc. no. 615, pp. 133–146.: Mentions only Salmo henshawi and Salmo tahoensis as native species and Cristivomer namaycush as an introduced species.

1907. Holway, Ruliff S. Physiographic Changes bearing on the Faunal Relationships of the Russian and Sacramento rivers, California. Science, N.S., XXVI, no. 664, Sept. 20, 1907, pp. 382–383.: Two connections between headwaters of Sacramento and Russian rivers are pointed out; the most important one was the shifting of Scott's Creek, by means of a prehistoric landslide from the Russian River drainage into the Sacramento *via*

Page	Plate	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
16	.....	Pantosteus araeopus	Catostomus occidentalis	738	South Fork of Kern River
16	.....	Catostomus occidentalis	Catostomus occidentalis	738	Middle Fork Kaweah near Three Rivers; North Fork Kaweah at Redstone Park, Kern Lake and Kern River.
16	.....	Mylopharodon conocephalus	Mylopharodon conocephalus	793	North, Middle and South forks of Kaweah; Three Rivers
17	.....	Ptychocheilus oregonensis	Ptychocheilus grandis	807	North Fork of Kaweah at Redstone Park, and Middle and South forks at Three Rivers
17	.....	Rutilus symmetricus	Hesperoleucus symmetricus	863	South Fork of Kaweah River above Three Rivers
18	XV	Salmo gilberti	Salmo gilberti	362	Kern Lake and Kern River above the lake
20	XVI	Salmo *whiteï*	Salmo whitei	365	Coyote Creek; South Fork of Kaweah River at South Fork Meadows; Soda Creek at Quinns Horse Camp; Little Kern River at Wet Meadow Creek
23	.....	Salmo agua-bonita	Salmo agua-bonita	3	South Fork of Kern River
26	I	Salmo *roosevelti*	Salmo roosevelti	366	Volcano Creek

TABLE

Clear Lake. This is regarded as the most important change and would make possible a transfer of Russian River species into the Sacramento. Snyder (1908) argues, however, that the transfer was in the other direction.

The second connection is that of Copeland Creek, which debouches over a fan spreading over the flat divide separating Russian River from the Bay, so that Copeland Creek in time of flood discharges both ways. This is regarded as unimportant, but since the common fishes are the up-stream species it would probably be the most important connection.

There is no mention of common species, or even any species of fish in the paper; the simple statement is that the faunas are similar, or have similar elements.

1907. Jordan, David Starr. The Trout and Salmon of the Pacific Coast. Rept. State Board Fish Comm. Cal., 1905–1906, pp. 77–92, with 11 text-figs.: This paper is a popular account of the Trout and Salmon of the Pacific Coast of America. It is not based upon any particular piece of fieldwork or collection of specimens; however, of the 15 species mentioned, six are associated with California waters as follows:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
78	Salmo clarkii	Salmo clarki	338	Eel River
79	Salmo henshawi	Salmo henshawi	343	Lake Tahoe, Truckee River, Donner, Webber and Independence lakes (introduced into: Feather, Stanislaus and Mokelumne rivers)
80	Salmo tahoensis	Salmo tahoensis	344	Lake Tahoe
81	Salmo rivularis	Salmo irideus (Steelhead)	357	Sacramento River
83	Salmo irideus	Salmo irideus	357	San Leandro Creek near Alameda, San Francisquito Creek and San Luis Rey River
85	Salmo gilberti	Salmo gilberti	362	Kern, Kings and Merced rivers and Kern Lake
87	Salvelinus malma	Salvelinus malma spectabilis	380	Upper Soda Springs on Sacramento River

TABLE

1908. Jordan, David Starr, and Grinnell, Joseph. Description of a new species of trout (Salmo evermanni) from the upper Santa Ana River, Mount San Gregorio, southern California. Proc. Biol. Soc. Wash., 1908 (January 23), XXI, pp. 31–32, pl. 1.: In this paper Salmo evermanni, new species, is described and recorded from the headwaters of the South Fork of the Santa Ana River, at 8200 feet altitude, four miles northwest of San Gorgonio Peak, the highest mountain in southern California.

1908. Snyder, J. O. The Fauna of Russian River, California, and its Relation to that of the Sacramento. Science, N.S., Vol. XXVII, no. 685, pp. 269–271, 1 map, Feb. 14, 1908.: This article follows, and is a commentary upon, an earlier paper in *Science* by Ruliff S. Holway on certain "Physiographic changes bearing on the Faunal Relationships of the Russian and Sacramento rivers, California.

A list of the indigenous fishes of Russian River is given, as shown in the following table:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
269	Entosphenus tridentatus	Entosphenus tridentatus	16	Russian River
269	Catostomus occidentalis	Catostomus occidentalis	738	Russian River
269	Mylopharodon conocephalus	Mylopharodon conocephalus	798	Russian River
269	Ptychocheilus grandis	Ptychocheilus grandis	807	Russian River
269	Rutilus symmetricus	Hesperoleucus symmetricus	863	Russian River
269	Oncorhynchus tschawytscha	Oncorhynchus tschawytscha	331	Russian River
269	Salmo irideus	Salmo irideus	357	Russian River
269	Gasterosteus cataphractus	Gasterosteus aculeatus	1852	Russian River
269	Cottus asper	Cottus asper	2997	Russian River
269	Cottus gulosus	Cottus gulosus	2996	Russian River
269	Cottus aleuticus	Cottus aleuticus	3016	Russian River
269	Hysterocarpus traski	Hysterocarpus traski	3252	Russian River

TABLE

of these, E. tridentatus, O. tschawytscha and S. irideus are anadromous forms, while G. cataphractus, C. asper, C. gulosus and C. aleuticus are able to withstand salt water. The others are strictly fluvial and are also found in the Sacramento; but the two river systems are completely isolated from each other, though the headwaters of their small tributaries rise in close proximity in the high mountains which divide their basins.

It is in this mountainous divide that Holway found evidence of a transfer of a part of a tributary from the Russian River to the Sacramento, and he assumes that the Sacramento derived its fish fauna from the Russian River.

This, however, seems highly improbable, since the Sacramento, a vastly larger and presumably older system, contains not only all the fluvial species known from the Russian River, but others not there represented.

Indications of a former connection between the two systems, necessary to explain the common members of their fauna, is furnished by Andrew C. Lawson, who in 1894 made a statement to the effect that at one time the Russian River, instead of turning abruptly westward to the ocean, continued its southward course through an uninterrupted valley to the region now occupied by San Pablo Bay.

However, there is among the Sacramento fishes, a considerable number of species not known to Russian River, of which the following may be mentioned:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
270	Orthodon microlepidotus	Orthodon microlepidotus	794	Lower Sacramento
270	Lavinia exilicauda	Lavinia exilicauda	804	Lower Sacramento
270	Pogonichthys macrolepidotus	Pogonichthys macrolepidotus	829	Lower Sacramento
270	Leuciscus crassicauda	Siboma crassicauda	855	Lower Sacramento

TABLE

The fact that these lower stream species are absent from the Russian River indicates that the transfer was by stream-robbing of the upper tributaries, like that described by Holway, but that it was in the opposite direction from which he supposed it to be, that is, from the Sacramento to Russian River.

1908. Rutter, Cloudsley. The Fishes of the Sacramento-San Joaquin Basin, with a Study of their Distribution and Variation. Bull. U. S. Bur. Fish., XXVII, 1907 (Sept. 28, 1908), pp. 103–152, pl. VI, text figs. 1–4.: The primary object of this investigation was to determine the distribution of the various species of fishes found in the Sacramento-San Joaquin Basin. The geography of the basin is discussed, and a synopsis of the streams is given with locations where collections were made, with descriptive notes concerning the character of the streams. In the biographical review a full bibliography giving all known records for the basin, including the list of species as reported and the identification accepted at the time of the publication under discussion. There is a key to the species, 36 in number. This is followed by an annotated list of the species, which includes descriptions and notes on range and variation. There is a topographical map showing the distribution of the Catostomidæ in the region under discussion. There is also a summary of the most noteworthy variations.

The following is the list of species noted:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
119	Entosphenus tridentatus	Entosphenus tridentatus	16	Goose Lake; Sullaway Creek at Sisson; and Stanislaus River at Parrot Ferry. Also reported (as *Lampetra cibaria*) from mouth of Feather River
120	Pantosteus lahontan	Pantosteus lahontan	735	Headwaters of North Fork of Feather River; Warner Creek at Johnson's; and North Fork of Feather River at Big Meadows
120	Catostomus *microps*	Catostomus microps	741	Rush Creek near Adin, Modoc County
121	Catostomus tahoensis	Catostomus tahoensis	751	Warner Creek at Johnson's Ranch; North Fork Feather River at Beckwith; Duck Lake; Miller Creek at Miller Pass
122	Catostomus occidentalis	Catostomus occidentalis	738	Goose Lake, North Fork of Pit River at mouth of Joseph Creek and near Alturas; South Fork of Pit River at South Fork Post Office, Pit River at Canby, Ash Creek at Adin, McCloud River at Baird, Sacramento River at Chico; Jacinto; Wilson's Farm, twenty miles below Grimes, and at Knights Landing; and Sacramento River at Redding; Clear Creek at Redding; Battle Creek at U. S. Hatchery; Sacramento River at Red Bluff; Thomas Creek at Tehama; Deer Creek at Vina; Feather River at Oroville; Indian Creek at Crescent Mills; Wolf Creek at Greenville; Clover Creek at Genesee; Squaw Queen Creek at Genesee; Middle Fork Feather River (Lahontan Basin) at Beckwith; and the same stream at Nelson Point; North Fork Yuba River at Bullards Bar; Rubicon River at Gerle (Lahontan Basin); South Fork American River at Placerville; Silver Creek near Orelli (Lahontan Basin); North Fork Cosumnes River; Pleasant Valley; Stanislaus River at Parrot Ferry; Tuolumne River at Bakers Ford; South Fork Tuolumne River near mouth; Merced River at Benton Mill and Livingston; Mariposa Creek at Mariposa; Chowchilla River and Fresno River at Raymond; San Joaquin River at Pollasky; Kings River at Centerville; Kaweah River at St. John Channel at Lemoncove; Tule River at Porterville, and Kern River at Bakersfield
125	Orthodon microlepidotus	Orthodon microlepidotus	794	Sacramento River at Butte City, and Colusa; Arcade Creek at Arcade; Sacramento River at Ryde, and Rio Vista; Suisun Bay at Black Diamond; China Slough and Kings River at Centerville
125	Lavinia exilicauda	Lavinia exilicauda	804	Battle Creek at U. S. Fish Hatchery; Sacramento River at Red Bluff, Chico Bridge, Jacinto, Wilson's Farm, twenty miles below Grimes; mouth of Feather River; Sacramento; Rio Vista, and Collinsville; Feather River at Marysville and Oroville; Antelope Creek at Grass Valley; American River at Folsom; Suisun Bay at Black Diamond; San Joaquin River at Antioch and Pollasky; Stanislaus River at Parrot Ferry; Merced River at Livingstone; Fresno River at Raymond; China Slough at Centerville; Kings River at Centerville; Kaweah River at St. John's Channel; and Tule River at Porterville
128	Mylopharodon conocephalus	Mylopharodon conocephalus	798	North Fork of Pit River at Alturas; Pit River at Canby, Bieber, and Pittville; Ash Creek at Adin; Sacramento River at Redding; at mouth of Clear Creek, at Red Bluff, six miles below Red Bluff; at Tehama, at Chico, at Jacinto, at Grimes, twenty miles below Grimes, at mouth of

				Feather River, at Sacramento; and at Collinsville; Battle Creek at U. S. Fish Hatchery; Thomas Creek at Tehama; Feather River at Oroville; Indian Creek at Crescent Mills; Squaw Queen Creek at Genesee; American River at Folsom; South Fork of American River at Placerville; Tuolumne River at Wards Ferry; South Fork of Tuolumne River near its mouth; Merced River at Livingston and Benton Mill; Fresno River at Raymond; San Joaquin River at Pollasky; China Slough and Kings River at Centerville; Kaweah River at St. John's Channel; Tule River at Porterville; and Kern River at Bakersfield
130	Pogonichthys macrolepidotus	Pogonichthys macrolepidotus	829	Sacramento River at Redding, Red Bluff, six miles below Red Bluff, Tehama, Chico Bridge, Jacinto, Grimes, Wilson's Farm, twenty miles below Grimes, Knights Landing, mouth of Feather River, Sacramento, Ryde, Rio Vista, and Collinsville; Battle Creek at U. S. Fish Hatchery; Feather River at Oroville; American River at Folsom; Carquinez Straits at Benicia; Suisun Bay at Black Diamond; San Joaquin River at Antioch and Pollasky; and Merced River at Livingston
131	Ptychocheilus grandis	Ptychocheilus grandis	807	Joseph Creek; North Fork of Pit River at Alturas; Pit River at Canby, Bieber, and Pittville; Ash Creek at Adin; Fall River at Fall River Mills; Sacramento River at Redding, Red Bluff, six miles below Red Bluff, Tehama, Vina, Chico Bridge, Jacinto, Grimes, Knights Landing, mouth of Feather River, Sacramento, Walnut Grove, and Rio Vista; Clear Creek at mouth; Battle Creek at U. S. Fish Hatchery; Thomas Creek at mouth; Feather River at Marysville and Oroville; Indian Creek at Crescent Mills; Wolf Creek at Greenville; Squaw Queen Creek at Genesee; North Fork of Yuba River at Bullards Bar; American River at Placerville; Carquinez Straits at Benicia; San Joaquin River at Antioch and Pollasky; Tuolumne River at Modesto; South Fork of Tuolumne River at mouth; Stanislaus River at Parrot Ferry; Merced River at Livingston and Benton Mill; Chowchilla River at Raymond; Fresno River at Raymond; China Slough and Kings River at Centerville; Kaweah River at St. John's Channel; Tule River at Porterville; and Kern River at Bakersfield
134	Leuciscus crassicauda	Siboma crassicauda	855	Mouth of Feather River; Kaweah River at St. John's Channel
134	Leuciscus conformis	Siboma conformias	856	Sacramento River twenty miles below Grimes and Kaweah River at St. John's Channel
135	Leuciscus egregius	Cheonda egregia	842	Warner Creek at Johnson's Ranch
135	Rutilus bicolor	Siphateles bicolor	873	Goose Lake, Calif.; South Fork of Pit River at South Fork Post Office; Pit River at Canby and Pittville; Ash Creek at Adin, Fall River at Dana; Hat Creek at Cassel; and Wolf Creek at Greenville, Indian Valley
137	Rutilus symmetricus	Hesperoleucus symmetricus	863	North Fork of Pit River at mouth of Joseph Creek and near Alturas; Sacramento River at Redding; Clear Creek at mouth, Battle Creek at U. S. Fish Hatchery; Thomas Creek at mouth; North Fork of Cosumnes River at Pleasant Valley; Tuolumne River at Bakers Ford; South Fork of Tuolumne River near mouth; Stanislaus River at Parrot Ferry; North Fork of Merced River at Bower Cave; Merced River at Benton Mill and Livingston; Mariposa Creek at Mariposa; Chowchilla River at Raymond; San Joaquin River at Pollasky and Fort Miller; Kings River at Centerville; Kaweah River at St. John's Channel; and Tule River at Porterville

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
139	Agosia robusta	Apocope robusta	1052	Goose Lake, Calif.; Davis Creek at Davis Creek Post Office; Joseph Creek; North Fork of Pit River at Alturas; South Fork of Pit River at South Fork Post Office; Pit River at Canby; Ash Creek at Adin; Fall River at Dana and Fall River Mills; Burney Creek at Burneyville; Sacramento River at Sims; Battle Creek at U. S. Fish Hatchery; Feather River at Oroville; Warner Creek at Johnson's; Duck Lake; North Fork of Feather River at Big Meadows; Spanish Creek at Quincy; Wolf Creek at Greenville; Clover Creek at Clover Valley; Middle Fork of Feather River at Beckwith; American River at Placerville; and Kings River at Centerville
139	Salmo irideus	Salmo shasta?	357	Gumboot Lake and other lakes in same vicinity; Sacramento River at Sisson, Sims, Jacinto, and Princeton; Sullaway Creek at Sisson, McCloud River at Bartle, Big Bend, and Lower Falls; Goose Lake, Calif.; Davis Creek at Davis Creek Post Office; North Fork of Pit River near source and near Alturas; South Fork of Pit River at South Fork Post Office; Rush Creek near Adin; Hat Creek at Cassel; Fall River at Dana and Fall River Mills; Bear Creek near Bartle; Burney Creek at Burneyville; Battle Creek at Battle Creek Meadows, Long's Ranch, and U. S. Fish Hatchery; Mill Creek at Morgan Springs; North Fork of Feather River near source; Warner Creek at Johnson's; Duck Lake at Big Meadows; Spanish Creek at Quincy; Wolf Creek at Greenville and Clover Creek at Genesee Valley and Clover Valley; Middle Fork of Feather River at Nelson Point; Gold Lake; Cole Creek at Sierraville; Three Salmon Lakes near Sierra City; Bassett Creek at Bassett Hotel; Rattlesnake Creek near Grass Valley; Rubicon River at Gerle; Big Silver Creek at Orelli; Little Silver Creek at Jones Ranch; North Fork of Cosumnes River at Pleasant Valley; Middle Fork of Mokelumne River at West Point; Licking Creek at Railroad Flat; South Fork of Mokelumne River; San Antonio Creek at Calaveras Grove; South Fork of Tuolumne River at mouth; and North Fork of Merced River at Bower Cave
143	Gasterosteus cataphractus	Gasterosteus aculeatus	1852	Battle Creek at U. S. Fish Hatchery, and Kings River at Centerville
143	Archoplites interruptus	Archoplites interruptus	2345	Battle Creek at U. S. Fish Hatchery; Sacramento River at Sacramento and Rio Vista; and Arcade Creek at Arcade
144	Hysterocarpus traski	Hysterocarpus traski	3252	Pit River at Pittville; Battle Creek at U. S. Fish Hatchery; Sacramento River at Red Bluff, Vina, Chico Bridge, Jacinto, and Wilson's Farm; Feather River at Marysville; San Joaquin River at Pollasky; and China Slough and Kings River at Centerville
144	Cottus *asperrima*	Cottus asperrimus	3003	Fall River at Dana (type locality); and Fall River at Fall River Mills
145	Cottus asper	Cottus asper	2997	Sacramento River at Redding, Red Bluff, Jacinto, and Chico Bridge; Feather River at Marysville; and Arcade Creek at Arcade
146	Cottus gulosus	Cottus gulosus	2996	Joseph Creek at mouth; South Fork of Pit River at South Fork Post Office; Pit River at Canby; Rush Creek near Adin; Fall River at Fall River Mills and Dana; Hat Creek at Cassel; Burney Creek at Burneyville; Sullaway Creek at Sisson; Sacramento River at Sisson and Sims; McCloud River at Baird; Battle Creek at U. S. Fish Hatchery; Feather River at Oroville; Warner Creek at Johnson's; American River at Placerville; and Stanislaus River at Parrot Ferry
146	Cottus *macrops*	Cottus macrops	3008	Fall River at Dana, type locality; Fall River Mills
147	Cottus beldingi	Cottus beldingi	3004	Cole Creek near Sierraville

1908a. Snyder, John Otterbein. The Fishes of the coastal streams of Oregon and Northern California. Bull. U. S. Bur. Fish., XXVII, 1907 (1908), 153–189. (Oct. 21, 1908.): Gives an account of the fish fauna of the smaller coastal streams of Oregon and northern California which have their origin west of the Sierra-Cascade Mountain System, and includes all of the streams reaching the ocean between the Columbia and Sacramento except the Klamath. The general conditions of the region are described. There are numerous tables of measurements of fishes and of their distribution, and a map showing the river systems involved. Half the area considered is in Oregon.

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
157	Entosphenus tridentatus	Entosphenus tridentatus	16, 17	Klamath River near mouth
158	Entosphenus tridentatus	Entosphenus tridentatus		South Fork Eel River near and at Garberville; South Fork Big River; Garcia River; Russian River, Healdsburg; Napa River, Calistoga
157	Acipenser medirostris	Acipenser acutirostris	183	Klamath River near mouth
157	Catostomus rimiculus	Catostomus rimiculus	*751b	Klamath River near mouth; Shasta River, Montague and Yreka
158	Catostomus occidentalis	Catostomus occidentalis	738	Russian River system: Roberts Creek; Russian River, Ukiah and Healdsburg; Warm Springs Creek; Dry Creek, Skaggs Springs; Dry Creek, Healdsburg; and Knights Valley Creek, also Napa River, Rutherford and Calistoga, and Conn Creek
157	Catostomus snyderi	Catostomus snyderi	740	Klamath River near mouth
158	Lavinia exilicauda	Lavinia exilicauda	804	Napa River, Rutherford
157	Leuciscus bicolor	Tigoma bicolor	852	Klamath River near mouth
158	Mylopharodon conocephalus	Mylopharodon conocephalus	798	Warm Springs Creek; Dry Creek, Skaggs Springs and Healdsburg; Russian River, Healdsburg, and Knights Valley Creek

* Omitted from the check-list. The number shows its proper place.

TABLE

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
158	Ptychocheilus grandis	Ptychocheilus grandis	807	Roberts Creek; Russian River, Ukiah and Healdsburg; Warm Springs Creek; Dry Creek, Healdsburg; Knights Valley Creek; Napa River, Calistoga; and Conn Creek
159	Rutilus bicolor	Siphateles bicolor	873	Klamath River near mouth; Shasta River, Montague and Yreka
160	Rutilus symmetricus	Hesperoleucus navarroensis	864	Navarro River near mouth, near Philo and near Boonville
160	Rutilus symmetricus	Hesperoleucus parvipinnis	865	Gualala River at North Fork, and Wheatfield Fork; Wheatfield Fork, Gualala
160	Rutilus symmetricus	Hesperoleucus venustus	866	Roberts Creek; Russian River, Ukiah and Healdsburg; Warm Springs Creek; Dry Creek, Skaggs Springs and Healdsburg; Knights Valley Creek; Napa River, Rutherford and Calistoga, and Conn Creek
159	Agosia klamathensis	Apocope klamathensis	1058	Klamath River near mouth; Shasta River, Montague and Yreka
159	Gasterosteus cataphractus	Gasterosteus aculeatus	1852	Klamath River near mouth; Redwood Creek, Orick; Mad River; Maple Creek; Elk River; Van Duzen Creek; South Fork Eel River near Garberville; Bear River, Capetown; Mattole River near mouth and at White Thorn; Usal Creek; Ten Mile River; Noyo River; Big River; South Fork Big River; Albion River; Navarro River near mouth, near Philo and near Boonville; Alder Creek; Garcia River near mouth, and 5 and 10 miles from mouth; Gualala River at North Fork, and Wheatfield Fork and Wheatfield Fork, Gualala; Roberts Creek; Russian River, Ukiah and Healdsburg; Dry Creek, Skaggs Springs and Healdsburg; Napa River, Rutherford and Calistoga; Conn Creek
160	Hysterocarpus traski	Hysterocarpus traski	3252	Russian River, Ukiah; Dry Creek, Healdsburg; Knights Valley Creek; Napa River, Calistoga; Conn Creek
159	Cottus asper	Cottus asper	2997	Klamath River near mouth; Redwood Creek, Orick; Mad River; Maple Creek; Little River; Elk River; Van Duzen Creek; South Fork Eel River near Garberville; Usal Creek; Ten Mile River; Noyo River; South Fork Big River; Albion River; Navarro River near mouth; Alder Creek; Garcia River near mouth, and 5 miles from mouth; Gualala River at North Fork and Wheatfield Fork; Dry Creek, Healdsburg
160	Cottus gulosus	Cottus gulosus	2996	Noyo River; South Fork Big River; Navarro River near Boonville; Warm Springs Creek; Knights Valley Creek; Napa River, Rutherford and Calistoga
159	Cottus klamathensis	Cottus klamathensis	3007	Shasta River, Montague and Yreka
160	Cottus aleuticus	Cottus aleuticus	3016	Maple Creek; Usal Creek; Albion River; Navarro River near mouth; Alder Creek; Garcia River near mouth and 5 miles from mouth; Gualala River at Wheatfield Fork

1910. Evermann, Barton Warren, and Latimer, Homer Baker. On a collection of Fishes from the Olympic Peninsula, together with notes on other West Coast Species. Proc. Biol. Soc. Wash., XXIII, 1910, pp. 131–140.: The following California records for freshwater species are given in this paper:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
132	Entosphenus tridentatus	Entosphenus tridentatus	16	San Pablo Bay
133	Ameiurus catus	Haustor catus	1156	Mare Island (introduced)
133	Pogonichthys macrolepidotum	Pogonichthys macrolepidotus	829	Mare Island
133	Ptychocheilus harfordi	Ptychocheilus grandis	807	Mare Island
133	Rutilus bicolor	Probably Hesperoleucus venustus	866	Walker Creek
133	Rutilus symmetricus	Probably Hesperoleucus venustus	866	Deep pond 1 mile from mouth of Olema Creek, but connected with it; Mouth of Papermill Creek; Bear Valley Creek, below flood gate
134	Alosa sapidissima	Alosa sapidissima	213	Mare Island (introduced)
134	Oncorhynchus tschawytscha	Oncorhynchus tschawytscha	331	Pond, Olema Creek and Bear Valley Creek
135	Salmo gairdneri	Salmo gairdneri	338	Junction Nicasio and Papermill creeks
135	Salmo irideus	Salmo irideus	357	Bear Valley Creek
136	Gasterosteus williamsoni	Gasterosteus aculeatus	1852	Papermill, Olema, and Bear Valley creeks
137	Archoplites interruptus	Archoplites interruptus	2345	Mare Island
138	Cottus asper	Cottus asper	2997	Bear Valley, Papermill and Walker creeks
138	Cottus gulosus	Cottus gulosus	2996	Junction Nicasio and Papermill creeks
138	Ilypnus gilberti	Ilypnus gilberti	3579	Tomales Bay; Papermill creek and Walker creek

TABLE

1912. Snyder, John Otterbein. A New Species of Trout from Lake Tahoe. Bull. U. S. Bur. Fish., XXXII, 1912, Doc. 768, pp. 25–28, December 31, 1912.: In this paper is described a supposed new species of trout, Salmo regalis, from Lake Tahoe. The type specimen, 323 millimeters long, was secured near Brockway, Lake Tahoe, August 23, 1912, by W. P. Lyon. It is deposited in the U. S. National Museum. Another specimen which Professor Snyder identifies as belonging to that species was taken by F. K. Pomeroy, a Stanford student, and a third was caught by

All three were taken near Brockway on the north side of Lake Tahoe. Still a fourth specimen taken near Tahoe City was sent by Charles A. Vogelsang to Stanford University.

1913. Snyder, John Otterbein. The Fishes of the Streams tributary to Monterey Bay, California. Bull. U. S. Bur. Fish., XXXII, 1912 (July 24, 1913), 49–72, pls. XIX–XXIV, figs. 1–3.:

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
56	Entosphenus tridentatus	Entosphenus tridentatus	16	San Lorenzo, Pajaro, and Salinas rivers
56	Catostomus *mniotiltus*	Catostomus mniotiltus	73a	Arroyo Seco Creek; Pajaro River, Watsonville
58	Orthodon microlepidotus	Orthodon microlepidotus	794	Salinas River at San Miguel; Pajaro River, Watsonville
58	Lavinia *ardesiaca*	Lavinia ardesiaca	804a	Salinas River at Salinas; Pajaro River, Watsonville
(59)	(Lavinia exilicauda)	(Lavinia exilicauda)	(804)	(Cache Creek and Putah Creek)
62	Ptychocheilus grandis	Ptychocheilus grandis	807	Monterey
64	*Hesperoleucas venustus*	Hesperoleucas venustus	866	Coyote Creek, Gilroy
(65)[1]	(*Hesperoleucas navarroensis*)	(Hesperoleucas navarroensis)	(864)	(Navarro River near Philo)
(66)[1]	(*Hesperoleucas parvipinnis*)	(Hesperoleucas parvipinnis)	(865)	(Gualala River, Sonoma County)
67	*Hesperoleucas subditus*	Hesperoleucas subditus	868	Uvas Creek, Salinas River, Arroyo Seco Creek; Pajaro River at Sargent; San Lorenzo River
70	Agosia carringtoni	Apocope carringtoni	1053	Pajaro River (Sacramento River)[2]
70	Salmo irideus	Salmo irideus	357	San Antonio and Nacimiento creeks[2]
70	Oncorhynchus tschawytscha	Oncorhynchus tschawytscha	331	San Lorenzo and Pajaro rivers
70	Oncorhynchus kisutch	Oncorhynchus kisutch	329	San Lorenzo River at Santa Cruz
71	Gasterosteus cataphractus	Gasterosteus aculeatus	1852	All streams tributary to Monterey Bay
71	Archoplites interruptus	Archoplites interruptus	2345	Pajaro River at Sargent (not in Coyote Creek)
71	Hysterocarpus traski	Hysterocarpus traski	3252	Pajaro and Salinas rivers
72	Cottus asper	Cottus asper	2997	Pajaro River
72	Cottus aleuticus	Cottus aleuticus	3016	"With C. asper"
72	Cottus gulosus	Cottus gulosus	2996	"Upper courses of the creeks"

[1] Species and localities in parentheses lie out of the region under discussion, but are introduced for comparison.
[2] Statement indefinite; species not certain.

TABLE

A list of both the anadromous and freshwater species is given, and the relationship of the species of the latter group is discussed. These are related to, and apparently derived from, the Sacramento fauna, through shifts in drainage basins in the past. The similarity of the freshwater fish faunas of the different streams, the mouths of which are now widely separated by barriers of salt water, is accounted for by the streams having a common lower course, now obliterated by subsidence of shore, but evidenced by drowned valleys or channels in the sea bottom. This is illustrated by a map.

1914. Grinnell, Joseph. An account of the Mammals and Birds of the lower Colorado Valley. Univ. Calif. Pub. Zool., Vol. 12, no. 4, pp. 51–294, pls. 3–13, 9 text-figs.: One species of freshwater fish taken in the backwater on the California side opposite Cibola is referred to by Dr. Grinnell in the following words: "A huge minnow, Ptychocheilus lucius, called locally Colorado Salmon, caught with hook and line in backwater," etc.

1915. Snyder, John Otterbein. Notes on a Collection of Fishes made by Dr. Edgar A. Mearns from Rivers tributary to the Gulf of California. Proc. U. S. Nat. Mus., XLIX, 1915, pp. 573–586, pls. 76–77.: In this paper Professor Snyder records two species of freshwater fishes from the larger streams of southern California : Notolepidomyzon santa-anœ Snyder, new species, and Richardsonius orcutti (Tigoma orcutti).

1916. Snyder, John Otterbein. The Fishes of the Streams tributary to Tomales Bay, California. Bull. U. S. Bur. Fish., XXXIV, 1914, Doc. 825, pp. 375–381, June 2, 1916.: Under the direction of the Bureau of Fisheries, Professor Snyder assisted by Lee R. Dice, visited the creeks tributary to Tomales Bay in the latter part of October, 1910, and, while searching for young salmon, made the collection of fishes upon which this report was based.

Professor Snyder states that "only two streams flow into Tomales Bay which are large enough to support fishes, Papermill Creek, with Olima and Bear Valley creeks as tributaries, which enters the southern end of the bay, and Walker Creek, which flows into the northern part. A recent examination of these streams shows that the fishes living there are specifically identical with those of near-by basins."

Following is a list of the species recorded :

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
378	Catostomus occidentalis	Catostomus occidentalis	738	Olima Creek. Papermill Creek, Sacramento River and Russian River
379	Hesperoleucus venustus	Hesperoleucus venustus	866	Olima, Bear Valley, Papermill, and Walker creeks and Russian River
380	Salmo irideus	Salmo irideus	357	Papermill, Olima, and Walker creeks
380	Gasterosteus cataphractus	Gasterosteus aculeatus	1852	Papermill, Olima, and Walker creeks
381	Cottus asper	Cottus asper	2997	Papermill, Olima, and Walker creeks
381	Cottus gulosus	Cottus gulosus	2996	Papermill Creek above Tocaloma

1916. Evermann, Barton Warren. Fishes of the Salton Sea. Copeia, no. 34, pp. 61–63, August 24, 1916.: This short paper is a brief report on observations made and species seen by the writer when on a visit to Salton Sea, May 7–14, 1916.

The species recorded are as follows: Carp (Cyprinus carpio); Bony-tail (Gila elegans); Humpback Sucker (Xyrauchen cypo = taxanus); Colorado River Trout (Salmo pleuriticus); Common Mullet (Mugil cephalus); Desert Minnow (Cyprinodon macularius). This last species was recorded in this paper also from Saratoga Springs, whence specimens were received through the kindness of Mr. Samuel Hubbard of Oakland. The Saratoga Springs species had been described as Cyprinodon nevadensis.

In 1924 numerous specimens of the Desert Minnow were obtained in the water flowing from an artesian well at Mecca, and others from Fish Springs on the west side of Salton Sea below Figtree John's Spring which was then dry. In 1926, Mr. Wallace Adams, while collecting fishes for the Steinhart Aquarium, found this fish in large numbers in the brackish waters of the Salton Sea.

1917. Snyder, John Otterbein. The Fishes of the Lahontan System of Nevada and Northeastern California. Bull. U. S. Bur. Fish., XXXV, 1915–16, Sept. 28, 1917, pp. 33–86, pls. III–V, text figs. 1–9.: One of a series of publications relating to the fishes of the Great Basin, which are of unusual interest, as they occupy basins which are without exterior drainage. Owens Valley, California, which has been discussed elsewhere, is of the same nature. Only a small portion of the Lahontan System, including such waters as Eagle Lake, Honey Lake, most of Lake Tahoe, and mere tips of certain rivers, as the Truckee, Carson, and branches of the Walker, extends into California. As the different drainage systems are isolated, only a few of the species mentioned in the publication belong to the California fauna. For purposes of comparison a num-

Page	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
42	Catostomus tahoensis	Catostomus tahoensis	751	Walker River, Truckee River and as *Chasmistes chamberlaini* Rutter, from Eagle Lake
47, fig. 1	Catostomus *arenarius*	Catostomus arenarius	751a (not in C-L.)	Fallen Leaf Creek near Lake Tahoe; and Lake Tahoe (spm. collected by Henshaw)
49	Pantosteus lahontan	Pantosteus lahontan	735	Pine Creek (Piney Creek?), Calif., (reported but not seen); Long Valley Creek
54	Richardsonius egregius	Cheonda egregia	842	"Almost universally distributed throughout the brooks, rivers and lakes of the region (Lahontan System) Humboldt River (U. S. Nat. Mus.) Fallen Leaf Creek; Truckee River near Pyramid Lake; Carson and Walker rivers; Lake Tahoe." Lake Tahoe is probably the only California locality; all other records from that state such as the Sacramento System, etc., being doubtful
58	Richardsonius *microdon*	Cheonda microdon	841	Lake Tahoe, near Tahoe City (type)
64	Leucidius *pectinifer*	Leucidius pectinifer	878	The Willows; Lake Tahoe, at Tahoe City (type locality)
67	Agosia robusta*	Apocope robusta	1052	Susan Creek; Fallen Leaf Creek
69	Coregonus williamsoni	Prosopium williamsoni	420	Lake Tahoe; Fallen Leaf Creek
70	Salmo henshawi	Salmo henshawi	343	Lake Tahoe; Truckee River
77	Salmo *aquilarum*	Salmo aquilarum	356	Eagle Lake (type locality)

* A California species, described first from Prosser Creek, California. According to Snyder *not* in the Sacramento Basin, but only in the Lahontan System, in tributaries of the Truckee and Susan rivers. In another paper he reports it from Owens River, California

Species in this paper not recorded for California, such as Salmo regalis, east side of Lake Tahoe, Salmo smaragdus, Cottus beldingi, Chasmistes cujus and the like, have been omitted.

In making comparisons of species, the following are listed from the Sacramento Basin : Catostomus microps; C. occidentalis, Siphateles formosus, Apocope carringtoni (as Agosia carringtoni) and Cottus gulosus and the following from the Klamath Basin : Catostomus rimiculus, C. snyderi, Siphateles bicolor, and Cottus gulosus.

Toward the end of the paper (p. 84) is a table giving in detail localities where specimens were collected, both in California and Nevada, and a list of introduced species, 10 in number, found in one state or the other.

1918. Snyder, John Otterbein. The Fishes of Mohave River, California. Proc. U. S. Nat. Mus., LIV, 1919, pp. 297–299 (March 15, 1918).: Description of Siphateles mohavensis, new species, Mohave River near Victor, California, Aug. 14, 1913. Clarence H. Kennedy, collector.

It had been previously recorded by Girard in 1856 as Algansea formosa. It is the only species found in the river, and is illustrated in an unnumbered text-figure (p. 299).

1919. Evermann, Barton Warren, and Bryant, Harold C. California Trout. California Fish and Game, Vol. 5, no. 3, pp. 105–135.: Following a general discussion, this paper gives a running list of both scientific and common names, key, descriptions, and a number of figures, some of them colored, of the trout of California, both native and introduced. There is a page of bibliography. Only the native species are recorded in the

Page	Figure	Species as recorded	Present identification	J. E. & C. check-list No.	Locality
108, 127	36	Salmo clarkii (Cutthroat Trout)	Salmo clarki	338	Pit River, Eel River and other streams in Humboldt and Del Norte counties
108, 127	37	Salmo henshawi (Tahoe Trout)	Salmo henshawi	343	Lake Tahoe, Donner, Webber, and Independence lakes and tributary streams
108, 129	----------	Salmo regalis (Royal Silver Trout)	Salmo regalis	337	Lake Tahoe
108, 129	----------	Salvelinus parkei (Dolly Varden)	Salvelinus malma spectabilis	380	McCloud River
108, 115	----------	Salmo shasta (Shasta Rainbow)	Salmo shasta	359	Upper Sacramento and McCloud rivers
108, 116	----------	Salmo stonei (Noshee or Stone Trout)	Salmo stonei	360	McCloud River
108, 118	----------	Salmo gilberti (Gilbert Rainbow, Kern River Trout)	Salmo gilberti	362	Kings and Kern rivers
108, 123	----------	Salmo agua-bonita (South Fork of Kern Golden Trout)	Salmo agua-bonita	364	South Fork of Kern River, Cottonwood Creek and Cottonwood lakes (introduced)
108, 124	Col. plate	Salmo roosevelti (Golden Trout; Roosevelt Trout)	Salmo roosevelti	366	Volcano Creek
108, 121	----------	Salmo whitei (Soda Creek or Little Kern Trout)	Salmo whitei	365	Little Kern and other western tributaries of Kern River
109	41	Salmo evermanni (San Gorgonio Trout)	Salmo evermanni	367	Streams about San Gorgonio Peak, Southern California
111, 112	Two col. plates, fig. 38	Salmo irideus (Rainbow Trout)	Salmo irideus	357	(Or Salmo gairdneri). Enters Coastwise streams from Ventura River northward to spawn, then returns to the sea
116	42	Salmo aquilarum (Eagle Lake Trout)	Salmo aquilarum	356	Eagle Lake and tributary streams

1919. Snyder, John Otterbein. An Account of Some Fishes from Owens River, California. Proc. U. S. Nat. Mus., LIV, 1919 (Dec. 13), pp. 201–205.: On account of its isolation, the fish fauna of Owens River is of unusual interest. The tributaries of this stream obtain their waters from the mountain slopes on each side, and the river flows into Owens Lake, which has no outlet, except through evaporation, and in consequence the waters of the lake are strongly impregnated by mineral salts. The river valley may be properly included within the Great Basin.

The report is based on a collection made by Mr. Clarence Kennedy, who collected in the vicinity of Laws. Four native species are represented, which possibly do not represent the entire fauna of the basin.

The fauna has been largely derived from the Lahontan System, two of its members possibly by stream capture, the other two being more difficult to account for. The following species were obtained : Catostomus arenarius, Siphateles obesus, Agosia robusta, and Cyprinodon macularius.

The Catostomus arenarius of Owens River has somewhat smaller scales and larger fins that those of the Lahontan system. The Agosia robusta has barbels *usually* present but sometimes absent on one or both sides, and lateral line complete or interrupted. Cyprinodon macularius is indicated as possibly an effective destroyer of mosquitoes.

Common names given : Catostomus arenarius = Sand-bar sucker; S. obesus = Lake Chub; A. robusta = Black Minnow; C. macularius = Spotted Pursy Minnow.

1924. Jordan, David Starr, and McGregor, Ernest Alexander. Description of a new species of Trout (Salmo rosei) from Lake Culver in the High Sierras of California. Proc. Acad. Nat. Sci. Phila., LXXVI, 1924, p. 19, pl. II.: This paper gives a description of Salmo rosei, an ally or derivation of the Kern River trout, Salmo gilberti, from Lake Culver and neighboring lakes of the high Sierra.

3. LIST OF SPECIES

Following is a systematic distributional list, so far as the writers have been able to determine, of all the species of fishes recorded from, or known to occur in, the fresh waters of California. Under each species are given in chronologic order, the various records of the occurrence of the species in California, and the particular waters from which recorded.

These records show a total of 77 species of freshwater fishes as known from California, belonging to families as follows:

Petromyzonidae, 2; Acipenseridae, 2; Salmonidae, 22; Catostomidae, 9; Cyprinidae, 27; Cyprinodontidae, 2; Empetrichthyidae, 1; Gasterosteidae, 1; Centrar-chidae, 1; Cottidae, 8; Embiotocidae, 1; Gobiidae, 1.

The sequence of species is that of the 1930 Check-list by Jordan, Evermann, and Clark. The numbers in parentheses are the serial numbers of the same species in that Check-list.

PETROMYZONIDAE

1. (16, 17). Entosphenus tridentatus (Gairdner). Three-toothed Lamprey; Western Lamprey.

San Francisco (Ayres 1854–1862, as Petromyzon ciliatus); Sacramento River (Girard 1858); Fort Redding, Calif., (Gill 1862, as Entosphenus epihexodon, no description and as of "Girard, not Richardson"); Clear Lake (Jordan & Gilbert 1894); Santa Ana River, Riverside (Jordan & Evermann 1896–1900). Klamath River near mouth; South Fork Eel River near and at Garberville; South Fork Big River; Garcia River; Russian River, Healdsburg; Napa River, Calistoga (Snyder 1908a). In the Museum of the California Academy of Sciences are 2 specimens of 4 obtained in Mokelumne River, just below the dam at Woodbridge, among rocks, July 6, 1928, Hibbard, Coll, and 2 from the mouth of San Lorenzo River, collected Mar. 29, 1929.

Pacific coast of America from southern California northward to Unalaska, ascending streams even as far as the headwaters of the Sacramento, Columbia and Fraser rivers for spawning purposes. After spawning once they die. The young descend to salt water, where they remain until mature.

2. (18). Lampetra ayresi Günther. Western Brook Lamprey.

San Francisco (Ayres 1854–1862, as Petromyzon plumbeus; the name preoccupied).

ACIPENSERIDAE

3. (180). Acipenser transmontanus Richardson. White Sturgeon; Oregon Sturgeon; Sacramento Sturgeon.

San Francisco Bay; San Pablo Bay; Suisun Bay; Lower Sacramento and San Joaquin rivers (Ayres 1854–1862, as A. brachyrhynchus); Sacramento River (Jordan & Gilbert 1881); entering all large streams from the Sacramento to the Fraser River (Eigenmann 1890).

4. (183). Acipenser acutirostris Ayres. Green Sturgeon.

San Francisco (Ayres 1854–1862, as A. acutirostris and A. medirostris); (Girard 1857 and 1858, as A. acutirostris and A. medirostris); (Eigenmann 1890); Pacific Coast, ascending the rivers from San Francisco northward (Jordan & Evermann 1896–1900); Klamath River, near mouth (Snyder 1908a); Collinsville, near Pittsburg, Sacramento River, 1926 (Calif. Acad. Sci. Collection).

SALMONIDAE

5. (327). Oncorhynchus gorbuscha (Walbaum). Humpback Salmon.

Sacramento River (Jordan & Gilbert 1881; Eigenmann 1890 "only occasionally"; Jordan & Evermann 1896–1900 "occasionally").

6. (328). Oncorhynchus keta (Walbaum). Dog Salmon; Hayko; Le Kai Salmon; Calico Salmon; Chum.

All streams from San Francisco to Bering Straits (Jordan & Gilbert 1881); San Francisco (Jordan & Jouy 1881); said to be abundant in the fall from the Sacramento northward (Eigenmann 1890); San Francisco to Kamchatka, ascending all streams in the fall and spawning at no great distance from the sea (Jordan & Evermann 1896–1900).

7. (329). Oncorhynchus kisutch (Walbaum). Silver Salmon; Kisutch; Skowitz; Hoopid Salmon; Coho Salmon; Bielaya Ryba; Quisutch; Tschaviche.

Sacramento River (Jordan & Gilbert 1881; Jordan & Jouy 1881); Sacramento in summer and fall (Eigenmann 1890); from San Francisco northward, ascending streams in the fall to no great distance (Jordan & Evermann 1896–1900); San Lorenzo River at Santa Cruz (Snyder 1913).

8. (331). Oncorhynchus tschawytscha (Walbaum). Chinook Salmon; Quinnat Salmon; Tchaviche; King Salmon; Columbia River Salmon; Spring Salmon; Sacramento Salmon, Tyee Salmon; Tschawytsche.

California (Bean 1880, as O. quinnat); Sacramento and Ventura rivers (Jordan & Gilbert 1881, as O. chouicha); Sacramento River and Monterey (Jordan & Jouy 1881, as O. chouicha); Sacramento River, young taken at Mare Island (Eigenmann 1890); Lopez Creek (Jordan 1894c); Alaska, Oregon and California, south to Ventura River, and to northern China, ascending all large streams; especially abundant in the Columbia and Sacramento rivers (Jordan & Evermann 1896–1900); Russian River (Snyder 1908); Pond, Olima Creek; Bear Valley Creek (Evermann & Latimer 1910); San Lorenzo and Pajaro rivers (Snyder 1913).

9. (337). Salmo regalis Snyder. Royal Silver Trout.

Lake Tahoe (Snyder 1912, type).

10. (338). Salmo clarki Richardson. Columbia River Trout; Cut-throat Trout. Eel River (Jordan 1907).

11. (343). Salmo henshawi Gill & Jordan. Lake Tahoe Trout; Silver Trout; Truckee Trout; Pyramid Lake Trout.

Lake Tahoe (Jordan & Henshaw 1878); (Jordan & Jouy 1881, as S. purpurata henshawi, type); Lake Tahoe (Eigenmann & Eigenmann 1891, as S. mykiss henshawi); Lake Tahoe and Feather River (Jordan 1894a, as S. mykiss); Tahoe, Donner, and Independence lakes; Truckee and Feather rivers (Jordan & Evermann 1896–1900, as S. mykiss henshawi); Truckee River, Tahoe, Donner, Webber and

Independence lakes, introduced into the Feather, Stanislaus and Mokelumne rivers (Jordan 1907); Lake Tahoe (Juday 1907); Lake Tahoe; Truckee River (Snyder 1917).

12. (344). Salmo tahoensis (Jordan & Evermann). Great Trout of Lake Tahoe.

Lake Tahoe (Jordan & Evermann 1896–1900 (1898) as Salmo clarkii tahoensis, type); (Jordan 1907; Juday 1907).

13. (348). Salmo pleuriticus Cope. Colorado River Trout.

Salton Sea (Evermann 1916).

14. (356). Salmo aquilarum Snyder. Eagle Lake Trout.

Eagle Lake near mouth of Pine Creek, Lassen Co. (Snyder 1917, type).

15. (357). Salmo irideus Gibbons. Rainbow Trout; Coast Range Trout.

Back of Martinez, toward the foot of Monte Diablo (Ayres 1854–1862, as Salmo Rivularis); San Leandro Creek (Gibbons 1855 as S. iridea, type); Humboldt Bay (Girard 1859a, as Salar irideus); San Mateo Creek; Petaluma (Girard 1856a); Chico Creek, San Francisco (Girard 1857); Chico Creek; San Francisco; Humboldt Bay; Head of San Mateo Creek; Petaluma Creek (Girard 1858, as Salar iridea); Merced River (Caton, J. D., 1870, as Salmo iridea); Ojai Creek, Ventura County (Jordan & Henshaw 1878); tributary of Pit River, Modoc County; Lake Tahoe; California (Bean 1880); San Luis Rey River and Sacramento River (Jordan & Jouy 1881); Allen Springs, Lake County (Eigenmann & Eigenmann 1889a); Clear Lake (Jordan & Gilbert 1894, S. mykiss irideus); Lopez Creek (Jordan 1894c, as S. mykiss irideus); Susan River; Prosser Creek (Rutter 1903); Sacramento River (Jordan 1970, as S. rivularis); San Leandro Creek; San Francisquito Creek; San Luis Rey River (Jordan 1907); Russian River (Snyder 1908); Bear Valley Creek (Evermann & Latimer 1910); San Antonio Creek (Snyder 1913); Papermill, Olima and Walker creeks (Snyder 1916).

16. (358). Salmo gairdneri Richardson. Brook Trout of Western Oregon to southern Alaska; Steelhead; Salmon Trout; Stit-tse.

Klamath River (Girard 1857, as Fario gairdneri); Sacramento River (Jordan & Gilbert 1881); Sacramento, Klamath, and Eel rivers, and streams near Monterey (Jordan 1894a); Lopez Creek (Jordan 1894c, as S. mykiss gairdneri); Klamath and San Luis Rey rivers; Purissima Creek (Jordan & Evermann 1896–1990, as Salmo irideus); Junction Nicasio and Papermill creeks (Evermann & Latimer 1910); entering practically all coastal streams of California from Ventura County on the South to the Oregon Line for spawning purposes, then returning to the sea (Evermann & Bryant 1919).

17. (359). Salmo shasta (Jordan). McCloud River Rainbow Trout; Shasta Trout. Rainbow Trout of fish culturists.

McCloud River (Jordan & Henshaw 1878, as S. henshawi); McCloud River (Campbell 1882, "Red-sided Trout"); Upper Sacramento (Jordan 1894a, as S. gairdneri shasta); McCloud River (Jordan & Evermann 1896–1900, as S. irideus shasta); Upper Sacramento and McCloud rivers (Evermann & Bryant 1919).

18. (360). Salmo stonei (Jordan). Nissuee Trout; No-shee Trout; Stone's Trout.

McCloud River (Jordan 1894, as S. gairdneri stonei); McCloud River and upper tributaries of the Sacramento (Jordan 1894a, as S. gairdneri stonei); McCloud River (Jordan & Evermann (1896–1900 as S. irideus stonei); McCloud River (Evermann & Bryant 1919).

19. (362). Salmo gilberti (Jordan). Gilbert Trout; Kern River Trout.

Kern River (Jordan 1894a, as S. gairdneri gilberti); South Fork of Kern River at Soda Springs (Jordan & Evermann 1896_1900, as S. irideus gilberti); Kern Lake and Kern River above the lake (Evermann 1906); Kern, Kings, and Merced rivers, Kern Lake (Jordan 1907); Kings and Kern rivers (Evermann & Bryant 1919).

20. (363). Salmo rosei Jordan & McGregor. Rose's Trout.

Lake Culver (type) and neighboring lakes of the High Sierras (Jordan & McGregor 1924).

21. (364). Salmo agua-bonita (Jordan). Golden Trout (of South Fork of Kern River).

South Fork of Kern River (Jordan & Henshaw 1878, as Salmo pleuriticus; not Cope); "Volcano or Whitney Creek, California" (by error, =Cottonwood lakes to which it had been transplanted from the south fork of the Kern (Jordan 1892, as S. mykiss agua-bonita); Whitney Creek, South Fork of Kern River, Cottonwood Creek, introduced (Gilbert 1893, as S. mykiss agua-bonita); Upper tributaries of Kern River (Jordan 1894a, as Salmo gairdneri agua-bonita); South Fork of Kern River; streams about Owens Lake (Jordan & Evermann 1896–1900, as Salmo irideus agua-bonita); South Fork of Kern River (Evermann 1906); South Fork of the Kern; Cottonwood Creek and Cottonwood Lakes (introduced) (Evermann & Bryant 1919).

22. (365). Salmo whitei Evermann. Stewart White Trout.

Cañon of Kings River (Gilbert 1893, as S. irideus); Coyote Creek, South Fork of Kaweah River; Soda Creek; Little Kern River (Evermann 1906, S. whitei); Native to Little Kern and other western tributaries of Kern River (Evermann & Bryant 1919).

23. (366). Salmo roosevelti Evermann. Roosevelt Trout; Volcano Creek Trout.

Volcano Creek (Evermann 1906, type); Native only to Volcano Creek (Evermann & Bryant 1919); Golden Trout Creek, Inyo County, July 31, 1923 (Calif. Acad. Sci. Coll.). Introduced from Volcano Creek into Rock Creek and other eastern tributaries of Kern River.

24. (367). Salmo evermanni Jordan & Grinnell. San Bernardino Trout; Evermann Trout.

Santa Ana River, headwaters above the falls (Jordan & Grinnell 1908, type); streams about San Gorgonio Peak, southern California (Evermann & Bryant 1919).

25. (380). Salvelinus malma spectabilis (Girard). Dolly Varden Trout; Oregon Charr; Bull Trout; Red-spotted Trout; Golet.

McCloud River (Bean 1880, as S. bairdi); lakes and streams of the Cascade Range from Mount Shasta northward to Alaska (Jordan & Gilbert 1881, as S. malma); McCloud River (Campbell 1882, as "Dolly Varden"); Upper Sacramento (Jordan 1894a, as S. malma); Upper Sacramento (Jordan & Evermann 1896–1900, as S. malma); Upper Soda Springs on Sacramento (Jordan 1907, as S. malma).

26. (420). Prosopium williamsoni (Girard). Rocky Mountain Whitefish.

Lake Tahoe; Truckee River; Trout Creek (Jordan & Henshaw 1878, as Coregonus williamsoni); Lake Tahoe (Eigenmann & Eigenmann 1891, as Coregonus williamsoni); Truckee River, Donner Lake (Rutter 1903, as Coregonus williamsoni). Lake Tahoe; Fallen Leaf Creek (Snyder 1917, as Coregonus williamsoni).

CATOSTOMIDAE

27. (728). Notolepidomyzon santa-anœ (Snyder). Santa Ana Sucker.

Larger streams of southern California (Snyder 1915, as Pantosteus santaanœ).

28. (735). Pantosteus lahontan Rutter.

Susan River (type); Little Truckee River; Prosser Creek (Rutter 1903); Warner Creek; North Fork Feather River and Warner Creek (Rutter 1908); Pine Creek; Carson and Humboldt rivers; Long Valley Creek (Snyder 1917).

29. (738). Catostomus occidentalis Ayres. Western Sucker.

San Francisco Markets (Ayres 1854); Sacramento and San Joaquin rivers and San Francisco Bay (Ayres 1854–1862); San Joaquin River at Stockton (Ayres 1854–1862, as C. labiatus); San Francisco Bay (Ayres 1854–1862, as C. labiatus); Sacramento-San Joaquin Basin (L. Agassiz 1855); San Francisco

(Girard 1856); Klamath Lake (Girard 1856, as C. labiatus); San Francisco (Girard 1857); San Francisco (Girard 1858); Klamath Lake (Girard 1858, as C. labiatus); South Fork Kern River (Jordan & Henshaw 1878, as C. arœopus); Sacramento, San Joaquin, McCloud River (Jordan 1878); Kern River (Jordan 1878, as C. arœopus); McCloud River (Campbell 1882, "Sucker"); Clear Lake (Jordan & Gilbert 1894); Sacramento and San Joaquin rivers (Jordan & Evermann 1896–1900); South Fork Kern River (Evermann 1906, as Pantosteus arœopus); North and Middle Fork Kaweah; Kern River and Kern Lake (Evermann 1906); San Francisquito, Madera, San Antonio, Stevens, Campbell, Guadalupe, Coyote, Alameda, Arroyo Honda, Smith and Isabel creeks, disappears at time of drouth and returns (Snyder 1905); Goose Lake; North Fork of Pit River at mouth of Joseph Creek and near Alturas; South Fork of Pit River at South Fork Post office; Pit River at Canby; Ash Creek at Adin; McCloud River at Baird; Sacramento River at Chico; Jacinto; Wilson's Farm, twenty miles below Grimes, and at Knights Landing; Stony Creek; Feather River at Oroville; Indian Creek at Crescent Mills; Wolf Creek at Greenville; Clover Creek and Squaw Queen Creek at Genesee; Middle Fork of Feather River at Beckwith and Nelson Point; North Fork of Yuba River at Bullard's Bar; Rubicon River at Gerle; South Fork of American River at Placerville; Silver Creek at Orelli; North Fork of Cosumnes River, Pleasant Valley; Stanislaus River at Parrot Ferry; Tuolumne River at Baker Ford; South Fork of Tuolumne River near mouth; Merced River at Benton Mill and Livingston; Mariposa Creek at Mariposa; Chowchilla and Fresno rivers at Raymond; San Joaquin River at Pollasky; Kings River at Centerville; St. John's Channel of Kaweah River at Lemoncove; Tule River at Porterville; and Kern River at Bakersfield (Rutter 1908); Russian River (Snyder 1908); Roberts Creek; Russian River at Ukiah and Healdsburg; Warm Springs Creek; Dry Creek, Skaggs Springs and Healdsburg; Knights Valley Creek; Napa River at Rutherford and Calistoga; Conn Creek (Snyder 1908a); Olema, Papermill Creek, Sacramento and Russian rivers (Snyder 1916); Sacramento River at Willows (Calif. Acad. Collection).

30. (738a). Catostomus mniotiltus Snyder. Pajaro Sucker.

Arroyo Seco Creek (type), Pajaro River, Watsonville (Snyder 1913).

31. (741). Catostomus microps Rutter.

Rush Creek, a tributary of Ash Creek, near Aden, Modoc Co., Calif. (type) (Rutter 1908).

32. (751). Catostomus tahoensis Gill & Jordan. Tahoe Sucker.

Lake Tahoe; Eagle Lake (Jordan & Henshaw 1873); Lake Tahoe (Eigenmann & Eigenmann 1891, tahoensis, C.); Willow Creek, Susan River, Little Truckee River, Prosser Creek (Rutter 1903); Eagle Lake (Rutter 1903, as Chasmistes chamberlaini); Warner Creek; North Fork Feather River; Duck Lake; Miller Creek at Miller Pass (Rutter 1908); Fallen Leaf Creek; Walker River; Truckee River; Star Creek; Deeth; and Eagle Lake (Snyder 1917).

33. (751a). Catostomus arenarius Snyder. Sand-bar Sucker.

Fallen Leaf Creek near Lake Tahoe; Lake Tahoe (Snyder 1917); Owens River (Snyder 1919).

34. (751b). Catostomus rimiculus Gilbert & Snyder.

Klamath River near mouth; Shasta River, Montague and Yreka (Snyder 1908a).

35. (765). Xyrauchen texanus (Abbott). Razor-back Sucker; Humpback Sucker.

Salton Sea (Evermann 1916, as Xyrauchen cypho).

CYPRINIDAE

36. (794). Orthodon microlepidotus (Ayres).

San Francisco Markets (Ayres 1854, as Leuciscus microlepidotus); Sacramento and San Joaquin rivers (Ayres 1854–1862, as Gila microlepidotus); San Francisco Bay (Ayres 1854–1862, as Gila microlepidotus); San Francisco (Girard 1856, 1857, 1858); Sacramento River (Jordan & Jouy 1881); Clear Lake (Jordan & Gilbert 1894); Sacramento, San Joaquin rivers (Jordan & Evermann 1896–1900); Coyote Creek (Snyder 1905); Sacramento River at Butte City, Colusa,

Ryde, and Rio Vista; Arcade Creek at Arcade; Suisun Bay at Black Diamond; and China Slough and Kings River at Centerville (Rutter 1908); Lower Sacramento (Snyder 1908); Salinas River; Pajaro River (Snyder 1913); Pajaro River, Watsonville (Calif. Acad. Collection).

37. (798). Mylopharodon conocephalus (Baird & Girard). Kaweah Chub.

San Joaquin River (Ayres 1854–1862, as M. robusta); San Francisco Bay (Ayres 1854–1862, as M. robusta); San Joaquin River (Girard 1854, Gila conocephala); San Joaquin River (Girard 1856); San Francisco (Girard 1856, as M. robusta); San Francisco (Girard 1857, as M. robustus); Rio San Joaquin (Girard 1858); San Francisco (Girard 1858, as M. robustus); San Francisco (Girard 1859, as M. robustus); San Joaquin River (Girard 1859, as M. conocephalus); Sacramento River (Jordan & Jouy 1881); Sacramento and San Joaquin rivers (Jordan & Evermann 1896–1900); North, Middle and South forks Kaweah River; Threerivers (Evermann 1906); North Fork of Pit River at Alturas; Pit River at Canby, Bieber and Pittville; Ash Creek at Adin; Sacramento River at Redding; at mouth of Clear Creek, at Red Bluff, six miles below Red Bluff, at Tehama, at Chico, at Jacinto, at Grimes, twenty miles below Grimes; at mouth of Feather River; at Sacramento; and at Collinsville; Battle Creek at U. S. Fish Hatchery; Thomas Creek at Tehama; Feather River at Oroville; Indian Creek at Crescent Mills; Squaw Queen Creek at Genesee; American River at Folsom; South Fork of American River at Placerville; Tuolumne River at Ward's Ferry; South Fork of Tuolumne River near its mouth; Merced River at Livingston and Benton Mill; Fresno River at Raymond; San Joaquin River at Pollasky; China Slough and Kings River at Centerville; Kaweah River at St. John's Channel; Tule River at Porterville, and Kern River at Bakersfield (Rutter 1908); Russian River (Snyder 1908); Warm Springs Creek; Dry Creek, Skaggs Springs and Healdsburg; Russian River, Healdsburg; Knights Valley Creek (Snyder 1908a).

38. (804). Lavinia exilicauda Baird & Girard. Hitch; Chigh.

Sacramento and San Joaquin rivers (Ayres 1854–1862, as Lavinia compressa); Sacramento River (Girard 1854); Poso Creek and Four Creeks (Girard 1854, as Leucosomus occidentalis); Sacramento River (Girard 1856); Monterey (Girard 1856, as Lavinia harengus); San Joaquin River (Girard 1857); Sacramento River; Poso Creek; San Joaquin River (Girard 1858); Monterey Plains (Girard 1858, as L. harengus); Poso, Four Creeks, Tulare Valley (Girard 1858, Luxilus occidentalis); Sacramento River (Girard 1859a); Clear Lake (Jordan & Evermann 1896–1900, as Luxilinus occidentalis); Clear Lake (Jordan & Evermann 1896–1900); Coyote and Alameda creeks (Snyder 1905); Battle Creek at U. S. Fish Hatchery; Sacramento River at Red Bluff; Chico Bridge; Jacinto; Wilson's Farm twenty miles below Grimes; mouth of Feather River; Sacramento River; Rio Vista and Collinsville; Feather River at Marysville and Oroville; Antelope Creek at Grass Valley; American River at Folsom; Suisun Bay at Black Diamond; San Joaquin River at Antioch and Pollasky; Stanislaus River at Parrot Ferry; Merced River at Livingston; Fresno River at Raymond; China Slough at Centerville; Kings River at Centerville; Kaweah River at St. John's Channel; and Tule River at Porterville (Rutter 1908); Lower Sacramento (Snyder 1908); Napa River, Rutherford (Snyder 1908a).

39. (804a). Lavinia ardesiaca Snyder. Silvery Minnow.

Pajaro River near Watsonville (type); Salinas River (Snyder 1913).

40. (807). Ptychocheilus grandis (Ayres). Sacramento Pike; Sacramento Squawfish.

San Francisco Market (Ayres 1854, as Leuciscus gracilis); "No definite locality" (Ayres 1854–1862, as Gila grandis); San Francisco Bay (Ayres 1854–1862); Sacramento-San Joaquin Basin (L. Agassiz 1855, P. major); San Francisco (Girard 1856); Monterey (Girard 1856, as P. rapax); San Francisco (Girard 1857, 1858); Monterey (Girard 1859, P. rapax); Sacramento River, (Jordan & Gilbert 1881a, as P. harfordi and P. oregonensis); Sacramento (Jordan & Jouy 1881, as P. harfordi and P. oregonesis); McCloud River (Campbell 1882, as "Whitefish"); Allen Springs, Lake County (Eigenmann & Eigenmann 1889a, as P. oregonensis); Clear Lake and Kelsey Creek (Jordan & Gilbert 1894, as P. oregonensis); Lower Sacramento River (Jordan & Evermann 1896–1900, as P. harfordi); Sacramento, San

Joaquin and Salinas rivers (Jordan & Evermann 1896–1900, as P. oregonensis); San Francisquito, Coyote, Alameda creeks (Snyder 1905); North, Middle and South forks of Kaweah River (Evermann 1906, P. oregonensis); Joseph Creek; North Fork of Pit River at Alturas; Pit River at Canby, Bieber, and Pittville; Ash Creek at Adin; Fall River at Fall River Mills; Sacramento River at Redding; Red Bluff; Six miles below Red Bluff; Tehama; Vina; Chico Bridge; Jacinto; Grimes; Knights Landing; Mouth of Feather River; Sacramento; Walnut Grove; Rio Vista; Clear Creek at mouth; Battle Creek at U. S. Fish Hatchery; Thomas Creek at mouth; Feather River at Marysville and Oroville; Indian Creek at Crescent Mills; Wolf Creek at Greenville; Squaw Queen Creek at Genesee; North Fork of Yuba River at Bullard's Bar; American River at Placerville; Carquinez Straits at Benicia; San Joaquin River at Antioch and Pollasky; Tuolumne River at Modesto; South Fork of Tuolumne River at mouth; Stanislaus River at Parrot Ferry; Merced River at Livingston and Benton Mill; Chowchilla River at Raymond; Fresno River at Raymond; China Slough and Kings River at Centerville; Kaweah River at St. John's Channel; Tule River at Porterville, and Kern River at Bakersfield (Rutter 1908); Russian River (Snyder 1908); Roberts Creek; Russian River, Ukiah and Healdsburg; Warm Spring Creek, Dry Creek, Healdsburg; Knights Valley Creek; Napa River, Calistoga; Conn Creek (Snyder 1908a); Mare Island (Evermann & Latimer 1910, as P. harfordi); Monterey (Snyder 1913).

41. (808). Ptychocheilus lucius Girard. White Salmon of the Colorado; Colorado River Squawfish.

Colorado River backwater, California side of the channel opposite Cibola (Grinnell 1914).

42. (810). Gila elegans Baird & Girard. Bony-tail; Gila Trout; Verde Trout. Salton Sea (Evermann 1916).

43. (829). Pogonichthys macrolepidotus (Ayres). Split-tail.

San Francisco markets (Ayres 1854, as Leuciscus macrolepidotus); San Joaquin River (Girard 1854, as P. inaequilobus); San Joaquin River and Petaluma (Girard 1856, as P. inaequilobus); Presidio, near San Francisco (Girard 1856, as P. argyreiosus); San Joaquin River; Petaluma; Sacramento near Fort Reading (Girard 1858, as P. inaequilobus); Presidio (Girard 1858, as P. argyreiosus); San Joaquin River (Girard 1859) and Sacramento River (Girard 1859a, as P. inaequilobus); Sacramento River (Jordan & Jouy 1881); Clear Lake (Jordan & Gilbert 1894); Sacramento and San Joaquin (Jordan & Evermann 1896–1900); Coyote Creek (Snyder 1905); Throughout the Sacramento River; Feather River; American River; San Joaquin River (Rutter 1908); Lower Sacramento (Snyder 1908); Mare Island (Evermann & Latimer 1910).

44. (841). Cheonda microdon (Snyder).

Lake Tahoe near Tahoe City (type) (Snyder 1917, as Richardsonius microdon.

45. (842). Cheonda egregia (Girard).

Aetna Springs, Napa County (locality probably erroneous) (Eigenmann & Eigenmann 1889, as Phoxinus clevelandi); Lake Tahoe (Eigenmann & Eigenmann 1891, as Phoxinus montanus); Lake Tahoe; Truckee River (Jordan & Evermann 1896–1900, as Leuciscus egregius); Willow Creek; Susan River (Rutter 1903, as Leuciscus egregius); Warner Creek (Rutter 1908, as Leuciscus egregius); "Almost universally distributed throughout the brooks, rivers and lakes of the region (Lahontan System), Humboldt River; Fallen Leaf Creek; Carson and Walker rivers; Lake Tahoe"; Lake Tahoe is probably the only California locality, all other records from that State, such as the Sacramento System, etc., being doubtful (Snyder 1917, as Richardsonius egregius).

46. (852). Tigoma bicolor Girard.

Klamath River, near mouth (Snyder 1908a, as Leuciscus bicolor).

47. (854). Tigoma orcutti (Eigenmann & Eigenmann).

Temecula River (Eigenmann & Eigenmann 1890, as Phoxinus orcutti); Rio San Luis Rey, Rio San Jacinto and Santa Ana River (Jordan & Evermann 1896–1900,

as Leuciscus orcutti); larger streams of southern California (Snyder 1915, as Richardsonius orcutti); Crystal Lake of San Gabriel River System July 25, 1930, Berry Campbell, collector, and small permanent stream, Coyote Pass Hills, Los Angeles County, February 2, 1831, Roland Case Ross, collector (Calif. Acad. Sci. Collection).

48. (855). Siboma crassicauda (Baird & Girard). Sacramento Chub.

San Francisco Market (Ayres 1854, as Leuciscus gibbus); Sacramento and San Joaquin Rivers (Ayres 1854–1862, as Lavinia gibbosa); Rio San Joaquin Girard 1854, as Lavina crassicauda); San Joaquin, Mercede [Merced], and Mohave rivers (Girard 1856); Sacramento near Fort Reading (Girard 1856, as Tigoma crassa); Sacramento (Girard 1857, as Tigoma crassa); Sacramento River (Girard 1857, as Tigoma crassa); Rio San Joaquin (Girard 1858); Sacramento River (Girard 1859, as Tigoma crassa); Rio San Joaquin (Girard 1859); Sacramento River (Jordan & Jouy 1881, as Squalius gibbosus); Clear Lake (Jordan & Gilbert 1894, as Leuciscus crassicauda); Sacramento and San Joaquin rivers (Jordan & Evermann 1896–1900, as Leuciscus crassicauda); Coyote Creek (Snyder 1905, as Leuciscus crassicauda); Mouth of Feather River; Kaweah River (Rutter 1908, as Leuciscus crassicauda); Lower Sacramento (Snyder 1908, as Leuciscus crassicauda).

49. (856). Siboma conformis (Baird & Girard).

Poso Creek; San Joaquin Basin (Girard 1854, as Lavinia conformis); Poso Creek, San Joaquin Valley (Girard 1856, as Tigoma conformis); Poso Creek (Girard 1859, as Tigoma conformis); Poso Creek, Tulare County (Jordan & Evermann 1896–1900, as Leuciscus conformis); Sacramento River; Kaweah River (Rutter 1908, as Leuciscus conformis).

50. (863). Hesperoleucus symmetricus (Baird & Girard). California Roach.

Fort Miller, San Joaquin Valley (Girard 1854, 1856, 1858, 1859, as Pogonichthys symmetricus); Owens Lake (Gilbert 1893, as Rutilus symmetricus); Rivers of California and probably generally distributed. Originally known from the San Joaquin and Merced rivers, and Kern Lake. Very common in streams of the Coast ranges from San Francisco to Salinas River, being in the brooks of the Santa Clara Valley the most abundant fish. Owens Lake; Mohave River, etc.; Tres Pinos Creek, San Benito County (Jordan & Evermann 1896–1900, as Rutilus symmetricus); San Francisquito, Madera, San Antonio, Campbell, Guadalupe, Coyote, Alameda, Arroyo Honda and Isabel creeks. Not known from Stevens Creek. Able to maintain itself in Madera Creek during periods of drouth when nothing remains of the stream except a few disconnected pools; generally distributed throughout the Sacramento Basin and subject to considerable variation (Snyder 1905, as Rutilus symmetricus); Russian River (Snyder 1908, as Rutilus symmetricus); Mouth of Joseph Creek; near Alturas; Redding; Mouth of Clear Creek; U. S. Fish Hatchery at Battle Creek; Mouth of Thomas Creek; Pleasant Valley on North Fork of Cosumnes River; Baker Ford, Tuolumne River; near mouth of South Fork of Tuolumne River; Parrot Ferry, Stanislaus River; Bower Cave, North Fork Merced River; Benton Mill, Merced River; Livingston, Merced River and Mariposa, Mariposa Creek; Raymond, Chowchilla River; Pollasky, San Joaquin River; Centerville, Kings River; St. John Channel, Kaweah River; Porterville, Tule River. One of the 12 species typical of and having wide distribution in the Sacramento-San Joaquin Basin (Rutter 1908, as Rutilus symmetricus).

51. (864). Hesperoleucus navarroensis Snyder. Navarro Roach.

Navarro River near Philo, California (Snyder 1907a, as Rutilus symmetricus, and Snyder 1913 under the above name).

52. (865). Hesperoleucus parvipinnis Snyder. Short-finned Roach.

Gualala River Basin (Snyder 1907a, as Rutilus symmetricus, and 1913, as Hesperoleucus parvipinnis).

53. (866). Hesperoleucus venustus Snyder. Venus Roach.

Roberts Creek; Russian River at Ukiah and Healdsburg; Warm Springs Creek; Dry Creek at Skaggs Springs and Healdsburg; Knights Valley Creek; Napa River at Rutherford and Calistoga; Conn Creek (Snyder 1908a, as Rutilus symmetricus); Walker Creek (Evermann & Latimer 1910, as Rutilus bicolor); Pond in

Olema Creek, Papermill Creek, Bear Valley Creek (Evermann & Latimer 1910, as Rutilus symmetricus); Coyote Creek at Gilroy (type) (Snyder 1913); Olema, Bear Valley, Walker, Papermill creeks; Russian River (Snyder 1916).

54. (868). Hesperoleucus subditus Snyder. Monterey Roach.

Salinas River; Arroyo Seco Creek, Pajaro River; San Lorenzo River; Uvas Creek, Pajaro River Basin (type) (Snyder 1913).

55. (872). Siphateles obesus (Girard).

Lake Tahoe; Eagle Lake, Lassen County; Smoke Creek, Modoc County (Jordan & Henshaw 1878, as Leucos obesus); Donner Lake (Eigenmann & Eigenmann 1891, as Algansea olivacea); Eagle Lake and Willow Creek (Rutter 1903, as Rutilus olivaceus); Owens River (Snyder 1919).

Snyder, who has compared the types, has decided that S. obesus and S. olivaceus are the same, and that S. oregonensis is probably not separable from them.

56. (873). Siphateles bicolor (Girard). Klamath Lake Roach.

Common to Pit River drainage and to the lakes and streams of southern Oregon; widely distributed in the Pit River region; exceedingly abundant in Wolf Creek, which enters the North Fork of Feather River through Indian Creek; Goose Lake; South Fork Pit River at South Fork Post office; Pit River near Canby and Pittville; Ash Creek near Adin; Fall River at Dana; Hat Creek at Cassel; Wolf Creek at Greenville; Indian Valley (Rutter 1908, as Rutilus bicolor); Klamath River near mouth; Shasta River, Montague and Yreka (Snyder 1908a, as Rutilus bicolor); Klamath River, Klamath Lakes and tributaries (Snyder 1917).

Eigenmann & Eigenmann 1889 reported this as Leucos bicolor from Aetna Springs, Napa County, California, but the locality is probably erroneous.

57. (874). Siphateles formosus (Girard).

Merced River (Girard 1856 and 1858, as Algansea formosa); San Francisco Bay due to freshening of water by floods (Ayres 1854–1862, as Algansea formosa); Kern Lake (Jordan & Henshaw 1878, as Leucos formosus).

58. (878). Leucidius pectinifer Snyder. Lake Minnow.

Eagle Lake, and Lake Tahoe at Tahoe City (type) (Snyder 1917).

59. (1033). Oregonichthys cumingi (Günther).

California, exact locality unknown (Günther 1868, as Ceratichthys cumingii); California (Jordan & Evermann 1896–1900, as Hybopsis cumingii).

60. (1052). Apocope robusta (Rutter). Black Minnow.

Prosser Creek (type); Spring Creek; Willow Creek; Susan River; Little Truckee River, and probably to be found in Eagle Lake (Rutter 1903, as Agosia robusta); Susan Creek; Carson River; Fallen Leaf Creek; Star Creek; Mary's Creek; Quinn River; restricted to the Lahontan System (Snyder 1917).

61. (1058). Apocope klamathensis (Evermann & Meek).

Klamath River near mouth, Shasta River, Montague and Yreka (Snyder 1908a, as Agosia klamathensis).

62. (1053). Apocope carringtoni Cope.

Camp Bidwell, Modoc County; Spring near Smoke Creek, Lassen County (Jordan & Henshaw 1878); Horse Lake, Modoc County (Jordan & Henshaw 1878, as A. vulnerata); Lake Tahoe, Shinn's Ranch, Modoc County (Jordan & Henshaw 1878, as A. ventricosa); Streams near Fort Bidwell (Cope 1883, as A. ventricosa and A. vulnerata); Lake Tahoe, Eigenmann, C. H. and R. S., 1891, as Agosia oscula); San Luis Creek (Jordan 1894c, as Agosia nubila); Pajaro River; Sacramento River (Snyder 1913, as Agosia carringtoni).

CYPRINODONTIDAE

63. (1396). Cyprinodon macularius Baird & Girard. Desert Minnow.

San Diego County, California, probably from salt springs in the desert (now Imperial County) (Girard 1859c, as Cyprinodon californiensis); San Diego (Jordan & Jouy 1881, as C. californiensis); Death Valley, Amargosa Creek (Gilbert 1893);

Springs in San Diego County; Saratoga Springs, Inyo County (Jordan & Evermann 1896–1900); Figtree John Spring, near Salton Sea (Evermann 1916); small stream from artesian well at Mecca and Fish Spring on west side of Salton Sea (Evermann collection 1924); Owens River (Snyder 1919); in San Felipe Creek near its mouth, and in dense schools along the shore of Salton Sea (Steinhart Aquarium collections 1926, etc.).

64. (1397). Cyprinodon nevadensis Eigenmann & Eigenmann.

Saratoga Springs, Death Valley, Inyo County, California (Eigenmann & Eigenmann 1888 and Evermann 1916, as Cyprinodon macularinus). (Samuel Hubbard collection.)

EMPETRICHTHYIDAE

65. (1399). Empetrichthys merriami Gilbert.

Amargosa Desert (Gilbert 1893) (type); Death Valley in southeastern California; springs of desert about Death Valley in eastern California (Jordan & Evermann 1896–1900).

GASTEROSTEIDAE

66. (1852). Gasterosteus aculeatus Linnacus. Common Stickleback.

Marshes of San Francisco Bay (Ayres 1854–1862, as G. serratus); Williamson's Pass (Ayres 1854–1862, as G. williamsoni); Tulare Lake (Ayres 1854–1862, as G. microcephalus); marshes of San Francisco Bay (Ayres 1854–1862, as G. plebius); Mountain Lake near San Francisco (Ayres 1854–1862, as G. inopinatus); Four Creeks, Tulare Valley (Girard 1854, 1859, as G. microcephalus); Williamson's Pass (Girard 1854, 1859, as G. williamsoni); Presidio (Girard 1857, as G. inopinatus); San Francisco, San Jose, Petaluma (Girard 1858, as G. plebius); Presidio (Girard 1858, as G. inopinatus); Williamson's Pass (Girard 1858, as G. williamsoni); in rivers and brackish waters from Los Angeles River to Puget Sound (Jordan & Gilbert 1881, as G. microcephalus); rivers from San Francisco to Alaska (Jordan & Gilbert 1881, as G. aculeatus cataphractus); San Bernardino (Gilbert 1893, as G. williamsoni); Clear Lake (Jordan & Gilbert 1894, as G. microcephalus); San Luis Creek (Jordan 1894c, as G. microcephalus); Four Creeks, San Gregorio Creek, Pilarcitos Creek, and other streams of the west slope of the Sierra Morena, on the San Francisco peninsula (Jordan & Evermann 1896–1900, as G. williamsoni microcephalus); Williamson's Pass; San Bernardino (Jordan & Evermann, 1896–1900, as G. williamsoni); Battle Creek; Kings River (Rutter 1908, as G. cataphractus); Russian River (Snyder 1908, as G. cataphractus); Papermill, Olema and Bear Valley creeks (Evermann & Latimer 1910, as G. williamsoni); all streams tributary to Monterey Bay (Snyder 1913, as G. cataphractus); Papermill, Olema and Walker creeks (Snyder 1916, as G. cataphractus); Klamath River near mouth; Redwood Creek, Orick; Mad River; Maple Creek; Elk River; Van Duzen Creek; South Fork Eel River near Garberville; Bear River, Capetown; Mattole River near mouth and at White Thorn; Usal Creek; Ten-mile River; Noyo River; Big River; South Fork Big River; Albion River; Navarro River near mouth, near Philo and near Boonville; Alder Creek; Garcia River near mouth and five and ten miles from mouth; Gualala River at North Fork and Wheatfield Fork; Wheatfield Fork, Gualala, Roberts Creek; Russian River at Ukiah and Healdsburg; Dry Creek at Skaggs Springs and Healdsburg; Napa River at Rutherford and Calistoga; Conn Creek (Snyder 1908a, as Gasterosteus cataphractus).

CENTRARCHIDAE

67. (2345). Archoplites interruptus (Girard). Sacramento Perch.

Sacramento River (Ayres 1854a, as Centrarchus maculosus); San Francisco Bay (Ayres 1854–1862); Sacramento River (Girard 1854, as Centrarchus interruptus); Sacramento River (Girard 1857, as Ambloplites interruptus); San Joaquin and Sacramento rivers; San Francisco (Girard 1858, as Ambloplites interruptus); San Joaquin River (Girard 1859, 1859b, as Ambloplites interruptus); Sacramento River (Jordan & Jouy 1881); Clear Lake (Jordan & Gilbert 1894); Sacramento, San Joaquin rivers and tributary lakes (Jordan & Evermann 1896–1900); U. S. Hatchery at Battle Creek; Arcade Creek at Arcade; and Sacramento River at Sacramento and Rio Vista (Rutter 1908).

COTTIDAE

68. (2996). Cottus gulosus (Girard).

San Joaquin River (Girard 1854, 1859, as Cottopsis gulosus); Upper Pit River (Girard 1857, Cottopsis gulosus); Presidio at Monterey (Girard 1857, as Cottopsis parvus); Monterey, Presidio, Fort Reading, Petaluma (Girard 1858, as Cottopsis parvus); Jesse's Valley, Modoc County (Jordan & Henshaw 1878, as Uranidea gulosus); McCloud River (Jordan & Jouy 1881, as Cottopsis gulosus); Allen Springs, Lake County (Eigenmann & Eigenmann 1889, as Uranidea semiscabra centropleura); Clear Lake (Jordan & Gilbert 1894); San Luis Creek (Jordan 1894c); streams of the Coast Range in California south to Point Concepcion (Jordan & Evermann 1896–1900); throughout the Sacramento-San Joaquin Basin; Stanislaus River at Parrot Ferry; American River, Placerville; Feather River, Oroville; Warner Creek, Johnsons; Battle Creek, U. S. Hatchery; McCloud River, Baird; Sacramento River, Sims and Sisson; Sullaway Creek, Sisson; Burney Creek at Burneyville; Joseph Creek at mouth; South Fork Pit River at South Fork Post office; Pit River at Canby; Rush Creek near Adin; Fall River, Fall River Mills and Dana (Rutter 1908); Russian River (Snyder 1908); Junction Nicasio and Papermill creeks (Evermann & Latimer 1910); "Upper courses of creeks" (Snyder 1913); Papermill Creek (Snyder 1916); Noyo River; South Fork Big River; Navarro River near Boonville; Warm Springs Creek; Knights Valley Creek; Napa River at Rutherford and Calistoga (Snyder 1908a).

69. (2997). Cottus asper Richardson. Prickly Bullhead.

Sacramento River (Jordan & Jouy 1881, as Cottopsis asper); Sacramento River, Reading, Red Bluff, Chico, and Jacinto; Feather River, Marysville, Arcade Creek, Arcade (Rutter 1908); Russian River (Snyder 1908); nearly every river basin between the Columbia and Sacramento, commonly found in the lower courses of the streams, often being abundant in brackish or even salt water, in deep quiet pools and over muddy bottom; Klamath River near mouth; Redwood Creek, Orick; Mad River; Maple Creek; Little River, Elk River, Van Duzen Creek; South Fork Eel River near Garberville; Usal Creek; Ten-mile River; Noyo River; South Fork Big River; Albion River; Navarro River near mouth; Alder Creek; Garcia River near mouth and five miles from mouth; Gualala River at North Fork and Wheatfield Fork; Dry Creek, Healdsburg (Snyder 1908a); Bear Valley, Papermill and Walker creeks (Evermann & Latimer 1910); Pajaro River (Snyder 1913); Papermill, Olema and Walker creeks (Snyder 1916).

70. (3000). Cottus shasta Jordan & Starks.

McCloud River, Baird, California (Jordan 1896, type); Upper Sacramento Basin about Mount Shasta (Jordan & Evermann 1896–1900).

71. (3003). Cottus asperrimus Rutter.

Fall River at Dana, California (Rutter 1898, type); Fall River at Fall River Mills (Rutter 1908, as Cottus asperrima).

72. (3004). Cottus beldingi Eigenmann & Eigenmann.

Lake Tahoe (Eigenmann & Eigenmann 1891, type); Lake Tahoe and Donner Lake (Jordan & Evermann 1896–1900); Susan River, Little Truckee River; Sage Hen Creek; Prosser Creek (Rutter 1903); Cole Creek (Rutter 1908).

73. (3007). Cottus klamathensis Gilbert.

Shasta River at Montague and Yreka (Snyder 1908a).

74. (3008) Cottus macrops Rutter.

Fall River at Dana (type) and at Fall River Mills (Rutter 1908).

75. (3016). Cottus aleuticus Gilbert.

Smith, Redwood, Mattole, Navarro, Alder, Garcia and Gualala rivers, in the lower courses near the sea (Snyder 1908a); Pajaro River (Snyder 1913).

Distribution in northern California is shown more in detail in the Snyder 1908a table.

EMBIOTOCIDAE

76. (3252). Hysterocarpus traski Gibbons.

Sacramento River (Gibbons 1854, 1854a and b, as Hysterocarpus Traskii); Fort Reading (Girard 1857 and 1858); Sacramento River (Alexander Agassiz 1861, as H. traski and Sargosoma fluviatilis); Sacramento and San Joaquin rivers, and streams southward to San Luis Obispo (Jordan & Gilbert 1881); Sacramento River (Jordan & Jouy 1881); Sacramento (Eigenmann & Ulrey 1892); Clear Lake (Jordan & Gilbert 1894); rivers of central California, chiefly in the Sacramento Valley, from Lake County to Santa Clara County, locally abundant (Jordan & Evermann 1896–1900); Pit River at Pittville; Sacramento River at Redding; U. S. Hatchery at Battle Creek; Sacramento River at Red Bluff; Vina, Chico Bridge; Jacinto, and Wilson Farm; Feather River at Marysville; San Joaquin River at Pollasky; China Slough and Kings River at Centerville (Rutter 1908); Russian River at Ukiah; Dry Creek at Healdsburg; Knights Valley Creek; Napa River, Calistoga; Conn Creek (Snyder 1908a); Pajaro and Salinas rivers (Snyder 1913).

GOBIIDAE

77. (3573). Eucyclogobius newberryi (Girard).

San Luis Obispo Creek (Jordan 1894c); streams of California, in small clear brooks near the sea; locally common in San Luis Obispo Creek; probably confined to fresh waters (Jordan & Evermann 1896–1900). It was however, described from Tomales Bay.

4. SPECIES OF FRESHWATER FISHES DESCRIBED AS NEW SPECIES FROM CALIFORNIA LOCALITIES

In the following table are given (1) as accurately as could be ascertained, the exact date of publication of the species listed; (2) a catalogue of the nominal species of freshwater fishes which have been described from California localities as new species, together with the authority for each; (3) the present identification of each; (4) the type locality, or particular water or place from which the type specimen was obtained; and (5) the name of the collector when known.

The names in the second column now regarded as synonyms are printed in italics.

In order to show the progress of ichthyological investigations of the freshwater fish fauna of California, the names have been arranged in chronological order.

From this list it will be seen that 90 nominal freshwater species have been described from California localities, and that 34 of these are now regarded as synonyms of species previously described, which leaves only 56 that are still regarded as good species.

Date published	Name as recorded	Present identification	Locality	Collector
1854, May 18	Hysterocarpus Traskii Gibbons, N.G.&N.S.	Hysterocarpus traski	Sacramento River	Mr. Morris
1854, May 18	Leuciscus *gibbosus* Ayres	Lavinia crassicauda	San Francisco market	
1854, May 18	Leuciscus microlepidotus Ayres	Orthodon microlepidotus	San Francisco market	
1854, May 18	Leuciscus macrolepidotus Ayres	Pogonichthys macrolepidotus	San Francisco market	
1854, May 18	Leuciscus *gracilis* Ayres	Ptychocheilus grandis	San Francisco market	
1854, May 18	Catostomus occidentalis Ayres	Catostomus occidentalis	San Francisco market	
1854, Sept. 18	Centrarchus *maculosus* Ayres	Archoplites interruptus	Market, from Sacramento and San Joaquin rivers	
1854, between May 20 and Oct. 20	Cottopsus *parrus* Girard	Cottus gulosus	Presidio, Monterey?	
	Gasterosteus *plebius* Girard	Gasterosteus aculeatus	Presidio (salt marshes)	
1854, Oct. 20	Hysterocarpus Traskii Gibbons	Hysterocarpus traski	Sacramento River	
1854, Oct. 20	Centrarchus interruptus Girard	Archoplites interruptus	Sacramento River	Dr. L. A. Heermann
1854, Oct. 20	Cottopsis gulosus Girard	Cottus gulosus	San Joaquin River	Dr. L. A. Heermann
1854, Oct. 20	Gasterosteus *williamsoni* Girard	Gasterosteus aculeatus	Williamson's Pass	Dr. L. A. Heermann
1854, Oct. 20	Gila conocephala Baird & Girard	Mylopharodon conocephalus	Rio San Joaquin	Dr. L. A. Heermann
1854, Oct. 20	Pogonichthys *inaequilobus* Baird & Girard	Pogonichthys macrolepidotus	San Joaquin River	Dr. L. A. Heermann
1854, Oct. 20	Pogonichthys symmetricus Baird & Girard	Hesperoleucus symmetricus	Fort Miller, San Joaquin Valley	Dr. L. A. Heermann
1854, Oct. 20	Lavinia exilicauda Baird & Girard	Lavinia exilicauda	Sacramento River	Dr. L. A. Heermann
1854, Oct. 20	Lavinia crassicauda Baird & Girard	Siboma crassicauda	San Francisco: Rio San Joaquin and tributaries	Dr. L. A. Heermann
1854, Oct. 20	Lavinia conformis Baird & Girard	Siboma conformis	Poso Creek, San Joaquin Basin	Dr. L. A. Heermann
1854, Oct. 20	Gasterosteus *inopinatus*, [inornatus]	Gasterosteus aculeatus	Presidio, fresh water (1 mile back of)	Lt. W. P. Trowbridge
1854, Oct. 20	Pogonichthys *argyreiosus* Girard	Pogonichthys macrolepidotus	Presidio	Lt. W. P. Trowbridge
1854, Nov. 27	Acipenser *medirostris* Ayres	Acipenser acutirostris	"Our waters" (San Francisco)	
1854, Nov. 27	Acipenser *brachyrhynchus* Ayres	Acipenser transmontanus	San Francisco Bay; San Pablo Bay; Suisun Bay; Lower Sacramento and San Joaquin rivers	
1854, Nov. 27	Acipenser acutirostris Ayres	Acipenser acutirostris	"This vicinity" (San Francisco), rare	
1854, Dec. 11	Catostomus occidentalis Ayres	Catostomus occidentalis	Sacramento and San Joaquin rivers	
1854, Dec. 11	Gila grandis Ayres	Ptychocheilus grandis	San Francisco market	
1854, Dec. 18	Lavinia *gibbosa* Ayres	Siboma crassicauda	San Francisco market, from Sacramento and San Joaquin rivers	
1854, Dec. 18	Lavinia *compressa* Ayres	Lavinia exilicauda	San Francisco market, from lower Sacramento and San Joaquin rivers	
1854, Dec. 25	Gila microlepidota Ayres	Orthodon microlepidotus	Lower waters of Sacramento and San Joaquin	
1855, Feb.	Centrarchus *maculosus* Ayres	Archoplites interruptus	San Francisco market, Sacramento and San Joaquin	
1855, Feb. 5	Petromyzon *plumbeus* Ayres	Lampetra ayresi	San Francisco	?
1855, Mar. 5	Catostomus *labiatus* Ayres	Catostomus occidentalis	San Francisco market, from San Joaquin River at Stockton	
1855, Mar. 12	Mylopharodon *robustus* Ayres	Mylopharodon concephalus	San Francisco market, from San Joaquin River	
1855, Mar. 19	Salmo iridea Gibbons	Salmo irideus	San Leandro Creek	Mr. Nevins
1855, April 16	Salmo *Rivularis* Ayres	Salmo irideus	Back of Martinez, toward foot of Mt. Diablo	Dr. Winslow
1855, April 16	Petromyzon *ciliatus* Ayres	Entosphenus tridentatus	San Francisco Bay	
1855, April 30	Gasterosteus *serratus* Ayres	Gasterosteus aculeatus	Marshes of Bay of San Francisco	
1855, May	Catostomus occidentalis Agassiz	Catostomus occidentalis	San Francisco	T. G. Carey
1855, May	Ptychocheilus *major* Agassiz	Ptychocheilus grandis	San Francisco	
1857, April 25	Mylocheilus fraterculus Girard	Mylocheilus fraterculus	Monterey, California?	Lt. W. P. Trowbridge
1857, April 25	Tigoma *crassa* Girard	Siboma crassicauda	Sacramento River near Fort Reading	Dr. John S. Newberry
1857, April 25	Algansea formosa Girard	Siphateles formosus	Merced River	Dr. A. L. Heermann
1857, April 25	Lavinia *harengus* Girard	Lavinia exilicauda	Monterey	A. S. Taylor

1857, April 25	Ptychocheilus *rapax* Girard	Ptychocheilus grandis	Monterey	Lt. W. P. Trowbridge
1860, Jan. 6	Cyprinodon *californiensis* Girard	Cyprinodon macularius	"San Diego County," probably in part that is now Imperial County	Dr. Thomas Webb
1861, Mar. 20	Sargosomus *fluviatilis* Agassiz	Hysterocarpus traski	Ms. name, no description nor locality	
1862, Oct. 28	Petromyzon *epihexodon* Gill	Entosphenus tridentatus	Fort Reading; based on discovery of Girard	
1867	Acipenser *carvi* Dumeril	Acipenser transmontanus	San Francisco	
1867, Oct. 28	Acipenser *ayresi* Dumeril	Acipenser transmontanus	San Francisco	
1867, Oct. 28	Acipenser *putnami* Dumeril	Acipenser transmontanus	San Francisco	
1867, Oct. 28	Acipenser (Antaceus) *alexandri* Dumeril	Acipenser acutirostris	San Francisco	
1867, Oct. 28	Acipenser (Antaceus) *oligopeltis* Dumeril	Acipenser acutirostris	San Francisco	
1876	Salmo *mendocinensis* Gibbons	Salmo gairdneri	Mendocino County	Joseph H. Clarke
1878	Salmo henshawi Gill & Jordan	Salmo henshawi	Lake Tahoe	Henshaw
1878	Catostomus *araeopus* Jordan	Catostomus occidentalis	South Fork Kern River	
1878, Dec.	Bdellostoma stoutii Lockington	Polistotrema stouti	Eel River	
1882?	Ptychocheilus *harfordi* Jordan & Gilbert	Ptychocheilus grandis	San Francisco market, from Sacramento River	
1889, Jan. 8	Cyprinodon nevadensis Eigenmann & Eigenmann	Cyprinodon nevadensis	Saratoga Springs, Death Valley, Inyo County	
1889	Phoxinus *clevelandi* Eigenmann & Eigenmann	Cheonda egregia	Aetna Springs, Napa County	
1889, Nov.	Uranidea *semiscabra centropleura* Eigenmann & Eigenmann	Cottus gulosus	Allen Springs, Lake County	
1891, Dec.	Cottus beldingii Eigenmann & Eigenmann	Cottus beldingi	Lake Tahoe	L. Belding
1893, May 31	Empetrichthys merriami Gilbert	Empetrichthys merriami	Death Valley in Southeast California	Merriam & Bailey?
1893	Salmo mykiss agua-bonita Jordan	Salmo agua-bonita	South Fork of Kern River (introduced into Cottonwood Lakes)	Mr. Harvey of Lone Pine
1893	Phoxinus (Tigoma) orcutti C.H.&R.S. Eigenmann	Tigoma orcutti	Temeculina River and tributaries	C. R. Orcutt
1894, June 5	Salmo gairdneri stonei Jordan	Salmo stonei	McCloud River at Baird	Livingstone Stone
1894, Sept.	Salmo gairdneri shasta Jordan	Salmo shasta	McCloud River at Baird	
1894, Sept.	Salmo gairdneri gilberti Jordan	Salmo gilberti	Kern River at Soda Springs	
1894, Sept.	Salmo irideus stonei Jordan	Salmo stonei	McCloud River at Baird	Livingstone Stone
1896, June 19	Cottus shasta Jordan & Starks	Cottus shasta	McCloud River at Baird	E. C. Starks
1897	Catostomus rimiculus Gilbert & Snyder	Catostomus tahoensis	Trinity River, Hoopa Valley, Humboldt County	Capt. W. E. Dougherty
1898	Salmo clarkii tahoensis Jordan & Evermann	Salmo tahoensis	Lake Tahoe, deep water	
1903, Mar. 31	Pantosteus lahonton Rutter	Pantosteus lahontan	Susan River, tributary Honey Lake	Rutter & Chamberlain
1903, Mar. 31	Chasmistes *chamberlaini* Rutter	Catostomus tahoensis	Eagle Lake	Rutter & Chamberlain
1903, Mar. 31	Agosia robusta Rutter	Apocope robusta	Prosser Creek	Rutter & Atkinson
1906, May 19	Salmo whitei Evermann	Salmo whitei	South Fork Kaweah River in South Fork Meadow	Evermann
1906, May 19	Salmo roosevelti Evermann	Salmo roosevelti	Volcano Creek	Evermann
1908, Jan. 23	Salmo evermanni Jordan & Grinnell	Salmo evermanni	Santa Ana River above Falls	Joseph Grinnell
1908, April 6	Pantosteus santa-anae Snyder	Notolepidomyzon santa-anae	Santa Ana River near Riverside	Edmund Heller
1908, Sept. 28	Catostomus microps Rutter	Catostomus microps	Ash Creek, near Adin, Modoc County	Rutter & Chamberlain
1908, Sept. 28	Cottus asperima Rutter	Cottus asperimus	Fall River at Dana	Rutter & Chamberlain
1908, Sept. 28	Cottus macrops Rutter	Cottus macrops	Fall River at Dana	Rutter & Chamberlain
1908, Oct. 21	Catostomus humboldtianus Snyder	Catostomus humboldtianus	Eel River, near Garberville, Humboldt County	
1909	Gasterosteus *santa-annae* Regan	Gasterosteus aculeatus	Santa Ana River	
1912, Dec. 13	Salmo regalis Snyder	Salmo regalis	Near Brockway, Lake Tahoe	W. P. Lyon
1913, July 24	Catostomus mniotiltus Snyder	Catostomus mniotiltus	Arroyo Seco Creek, Monterey County	
1913, July 24	Lavinia ardesiaca Snyder	Lavinia ardesiaca	Pajaro River, near Watsonville	
1913, July 24	Hesperoleucus venustus Snyder	Hesperoleucus venustus	Coyote Creek near Gilroy (Hot Springs)	
1913, July 24	Hesperoleucus navarroensis Snyder	Hesperoleucus navarroensis	Navarro River near Philo	
1913, July 24	Hesperoleucus parvipinnis Snyder	Hesperoleucus parvipinnis	Gualala River, Sonoma County	
1913, July 24	Hesperoleucus subditus Snyder	Hesperoleucus subditus	Uvas Creek, Pajaro River Basin, Santa Clara County	
1917, Sept. 24	Richardsonius microdon Snyder	Cheonda microdon	Lake Tahoe, near Tahoe City	Snyder?
1917, Sept. 28	Salmo aquilarum Snyder	Salmo aquilarum	Eagle Lake, near mouth of Pine Creek	
1918, Mar. 15	Siphateles mohavensis Snyder	Siphateles mohavensis	Mohave River, near Victor	C. H. Kennedy
1924, June 9	Salmo rosei Jordan & McGregor	Salmo rosei	Lake Culver, High Sierras	

CALIFORNIA FRESHWATER FISHES BY DRAINAGE BASINS

	Coastal streams	Klamath Lakes basin	Sacramento-San Joaquin drainage	Lake Lahontan basin	Colorado River drainage	Salton Sea
Polistotrema stouti	x					
Entosphenus tridentatus	x		x			
Lampetra ayresi			x?			
Acipenser transmontanus			x			
Acipenser acutirostris		x	x			
Oncorhynchus gorbuscha			x			
Oncorhynchus keta	x		x			
Oncorhynchus kisutch	x		x			
Oncorhynchus tschawytscha	x		x			
Salmo regalis				x		
Salmo clarki	x					
Salmo henshawi			x	x		
Salmo tahoensis				x		
Salmo pleuriticus					x	
Salmo aquilarum				x		
Salmo irideus	x					
Salmo gairdneri	x	x	x			
Salmo shasta			x			
Salmo stonei			x			
Salmo gilberti			x			
Salmo rosei			x			
Salmo agua-bonita			x			
Salmo whitei			x			
Salmo roosevelti			x			
Salmo evermanni	x					
Salvelinus malma spectabilis			x			
Prosopium williamsoni				x		
Notolepidomyzon santa-anae	x					
Pantosteus lahontan				x		

CALIFORNIA FRESHWATER FISHES BY DRAINAGE BASINS—Continued

	Coastal streams	Klamath Lakes basin	Sacramento-San Joaquin drainage	Lake Lahontan basin	Colorado River drainage	Salton Sea	Owens River drainage
Catostomus occidentalis	x	x	x				
Catostomus rniotiltus	x						
Catostomus microps			x				
Catostomus tahoensis			x	x			
Catostomus arenarius				x			x
Catostomus rimiculus		x					
Xyrauchen texanus					x	x	
Orthodon microlepidotus	x		x				
Mylopharodon concephalus	x		x				
Lavinia exilicauda	x		x				
Lavinia ardesiaca	x						
Ptychocheilus grandis	x		x				
Ptychocheilus lucius					x		
Gila elegans					x	x	
Pogonichthys macrolepidotus			x				
Cheonda microdon				x			
Cheonda egregia				x			
Tigoma bicolor		x					
Tigoma oreutti	x						
Siboma crassicauda			x				
Siboma conformis			x				
Hesperoleucus symmetricus	x		x				x
Hesperoleucus navarroensis	x						
Hesperoleucus parvipinnis	x						
Hesperoleucus venustus	x		x				
Hesperoleucus subditus	x						
Siphateles obesus				x			x
Siphateles bicolor		x	x				
Siphateles formosus			x				

CALIFORNIA FRESHWATER FISHES BY DRAINAGE BASINS

CALIFORNIA FRESHWATER FISHES BY DRAINAGE BASINS—Continued

	Coastal streams	Klamath Lakes basin	Sacramento-San Joaquin drainage	Lake Lahontan basin	Colorado River drainage	Salton Sea	Death Valley
Leucidius pectinifer		x					
Oregonichthys cumingi*							
Apocope robusta				x			
Apocope klamathensis		x					
Apocope carringtoni	x	x	x				
Cyprinodon macularius					x	x	
Cyprinodon nevadensis							x
Empetrichthys merriami							x
Gasterosteus aculeatus	x		x				
Archoplites interruptus			x				
Cottus gulosus	x		x				
Cottus asper	x	x	x				
Cottus shasta			x				
Cottus asperrimus			x				
Cottus beldingi				x			
Cottus klamathensis		x					
Cottus macrops			x				
Cottus aleuticus	x						
Hysterocarpus traski	x		x				
Eucyclogobius newberryi	x						

* No locality known.

CALIFORNIA FRESHWATER FISHES BY DRAINAGE BASINS

5. INTRODUCED SPECIES

Following is an annotated list of the species of freshwater fishes whose introduction into California has been attempted. Many of these attempts were unsuccessful; others, notably, those with the Shad and the Striped Bass, have proved eminently successful, and considerable success attended the efforts with the Largemouth Black Bass and the Small-mouth Black Bass.

1. (203). Chanos cyprinella Cuvier & Valenciennes, Milkfish; Awa.

One hundred introduced from Hawaii into a small stream at Bridgeport, Solano County, July, 1876. Apparently none survived. A food fish of some importance, ranging from the Hawaiian Islands to the Gulf of California, occasionally entering streams.

2. (213). Alosa sapidissima (Wilson). Potomac Shad.

About 10,000 planted in Sacramento River at Tehama, by Seth Green, June 27, 1871. A start was made from the east coast with 15,000, but a few were lost on the way, and some planted en route. The plant was phenomenally successful. The species has continued to increase until it is now one of the most common and important food fishes in our waters.

3. (333). Salmo salar Linnæus. Atlantic Salmon.

Three hundred five planted June 12, 1874, in the Sacramento River at Redding, and in May, 1891, 194,000, hatched at Fort Gaston, California, were placed in a pond until the last of July when, having attained considerable size, they were liberated in Trinity River. Some of the salmon planted in 1891 did well, and some having reached full size were said to have been taken by Indians. No other reports have been received.

4. (334). Salmo sebago Girard. Land-locked Salmon; Sebago Salmon.

During the period from 1878 to 1896 numerous plants of this species were made in various parts of California, young fry being planted. The early reports (State Report of the Commission for 1885–1886) announce that they increased and thrived and that many large ones had been captured within those years. They do not seem to have increased of late years, however. They thrived at the Sisson hatchery, but no attempt was made to propagate them.

5. Salmo trutta levenensis (Walker). Loch Leven Trout.

Eggs were brought from the Northville, Michigan, Station, February, 1894, and hatched in Sisson, and in July, 1895, 250 about three inches long were planted in

Webber Lake, Nevada County. The stock has been retained in the Sisson hatchery ever since its introduction. There they have been propagated successfully, and thousands of the fry are shipped each year for distribution in the public waters of the State. The Loch Leven and German brown trout are closely allied and appear to be but different forms of the same species. They are somewhat different in their habits, but do equally well in the clear, cold lakes and streams of the Sierras, as well as in the region about Mount Shasta. The two forms have been crossed at the Sisson hatchery, and have produced a strong gamy fish.

6. Salmo fario Linnæus. The European Brown Trout; German Trout; Von Behr Trout.

Several plantings of this species were made in the State beginning with 1893, in Humboldt County. In 1895, 135,000 Von Behr or German brown trout eggs (Salmo fario) were hatched at the Sisson hatchery. Several thousand fry were placed in the ponds to be raised for breeders, and the remainder were distributed in a number of the lakes and streams of the high Sierras. As remarked in connection with the preceding species, they do well in the clear cold lakes and streams of the Sierras as well as in the region around Mount Shasta.

7. (369). Cristivomer namaycush (Walbaum). Great Lake Trout; Mackinaw Trout.

In November, 1894, the U. S. Fish Commission sent 100,000 eggs of this species to the California Fish Commission. They hatched well, and in May, 1895, 65,000 fry were placed in Lake Tahoe, the remainder being retained at the Sisson hatchery. They were reported to be doing well and multiplying and are said to be occasionally taken by fishermen at the lake. A number of these fish are taken each season from the waters that have been stocked, where they have thrived to a considerable extent, but not so well as was expected (Shebley). In 1922 an unusual amount was caught in Donner Lake.

8. (371). Silvelinus fontinalis (Mitchill). Eastern Brook Trout.

Introduced as early as 1872 by the California Fish Commission and planted in the North Fork of the American River, in the headwaters of Alameda Creek, and in the San Andreas reservoir near San Francisco. Later plantings were made in many other waters thought suitable through the State. It did not prosper in the short coast streams but has become naturalized in many of the streams in the Lake Tahoe region, in branches of the Truckee River, in Webber Lake, and elsewhere. About 1892 it was hybridized with the Dolly Varden trout at the Sisson hatchery. The crosses are said to exhibit very beautiful colors. Each year the Commission distributes thousands of this species in nearly every county having suitable waters; they are now one of our most sought after fish.

9. (413). Coregonus clupeaformis (Mitchill). Whitefish.

Twenty-five thousand from Lake Superior planted in Clear Lake in 1872–1873; 20,000 from Lake Michigan hatched at Berkeley and placed in Tulare Lake on March 29, 1875; 75,000 fry planted in Donner Lake, 50,000 in Sereno Lake and other lakes in Placer County; and 175,000 in Lake Tahoe in 1877. Many other plants made later. The results, however, were extremely meager, if not altogether negative.

10. (429). Thymallus montanus Milner. Montana Grayling.

In 1904, and again in 1905, an attempt was made to introduce the Montana Grayling into California. The eggs, obtained from Bozeman, Montana, and placed in the Sisson hatchery, hatched well, and the young thrived for a year and a half, when most of them died. The few remaining ones were lost before reaching maturity. A recent report states that grayling have been taken in Merced River, Yosemite Valley, where they had been planted.

11. (517). Anguilla rostrata (Le Sueur). American Eel.

Numerous attempts were made to introduce the Atlantic Eel into California. A fruitless attempt, due to the wrecking of the Fish Commission car, was made in 1873; in 1874, June 12, twelve eels from the Hudson River were placed in a slough of the Sacramento River near Sacramento and about 1500 were placed in an inlet of San Francisco Bay, near Oakland. Other plantings were made later, some of

the fish from 12 to 24 inches in length being planted in Suisun Bay at the edge of the tules. There have been occasional reports of captures up to 1880. The attempted introduction, however, was a failure.

12. Cyprinus carpio Linnæus. German Carp.

Introduced in 1872 by Mr. J. A. Poppe, who brought five fish from Holstein, Germany, and put them in private waters in California. Introduced later also by the U. S. Fish Commission from Japan and Germany. Now common in many waters throughout the State, and more or less of a nuisance.

13. (814). Notemigonus crysoleucas (Mitchill). Golden Shiner.

Reported in small creeks near San Diego by Hubbs; probably introduced with fishes brought from the east.

14. (1152). Ictalurus punctatus (Rafinesque). Channel Cat; Fiddler.

Ten introduced into Chico Creek, in 1895, and plants of yearlings made in Lake Cuyamaca and Feather River, in 1891, each water receiving 250 fish. Apparently unsuccessful. The most highly prized of the catfishes, preferring a lively current to stagnant water.

15. (1156). Haustor catus (Linnœus). White Cat; Channel Cat of the Potomac.

Fifty-six examples from Raritan River, New Jersey, introduced by Livingston Stone, placed in the San Joaquin River near Stockton, June 12, 1874. Some were in the Steinhart Aquarium until recently, but apparently succumbed to Lernœa, a parasitic crustacean.

16. (1162). Ameiurus natalis (Le Sueur). Yellow Cat.

Two species of the common eastern catfishes, *natalis* and nebulosus, were probably introduced together in 1874, and they are more or less confused in the records, A. nebulosus, which became known as the "Sacramento Cat," entirely eclipsing the other.

17. (1164). Ameiurus nebulosus (Le Sueur). Common Bullhead; Horned Pout; Small Catfish; Schuylkill Cat; Sacramento Cat.

Seventy examples were brought by Livingston Stone from Lake Champlain, Vermont, and placed in ponds and sloughs near Sutterville, June 12, 1874. They later became abundant. One writer, in discussing both nebulosus, which he says is known in California as the yellow or mud cat, and the blue catfish (Ameiurus natalis) (an evident confusion of names), reports that "the introduction of catfish into California can be considered one of the great achievements of the California Fish and Game Commission and of more importance from an economic and commercial point of view, perhaps, than the introduction of the striped bass." In the year 1874, 144 were obtained from the Schuylkill River, Pennsylvania, and later others were received from the Missouri River. All of these were planted in the San Joaquin River near Lathrop. They increased to remarkable numbers. During 1900 the shipments of dressed catfish from Sacramento alone were enormous. Shipments were even made to the native home of the catfish, Missouri and Mississippi river points. They supplied the markets of Chicago, Salt Lake, Denver, Portland, and other middle and eastern points. By the year 1909, however, due to the fyke net and other methods of overfishing, the catfish was in danger of extermination in California.

18. (1320). Esox ohiensis Kirtland. Chautauqua Muskellunge.

In May, 1893, the New York Fish Commission furnished the California Fish Commission 100,000 fry of this species from Chautauqua Lake. 93,000 were placed in Lake Merced near San Francisco, in an attempt by the Spring Valley Water Company to clear the lake of Carp. This planting appears to have been a failure, as none of the fish was ever found.

19. (1325). Esox vermiculatus Le Sueur. Pickerel.

In December, 1891, a plant of 400 yearling pike from Quincy, Illinois, was made in Lake Cuyamaca near San Diego, and another 100 in Feather River in Butte County. In Lake Cuyamaca in 1926 it was reported that the fish had survived and thriven and were more numerous than any other of the eastern species,

black bass, yellow perch, catfish and crappie, which were planted in the lake at the same time. The species intended to be introduced was the pike, Esox estor, but a specimen secured was determined by Dr. Jordan as the pickerel. It is possible both species were included.

20. (1423). Gambusia patruelis (Baird & Girard). Top Minnow; Mosquito Fish.

Extensively introduced into ponds and streams in California. Abundant in creeks and irrigation ditches of the Imperial Valley and about the Salton Sea, where it assumes a rich turquoise-blue coloration and appears to be driving out the desert minnow, Cyprinodon macularius, which, according to Snyder, appears to be effective as a mosquito-exterminator in Owens Valley (Snyder 1917a).

21. (2180). Perca flavescens (Mitchill). Yellow Perch.

In December, 1891, 3000 yearling yellow perch were placed in the Feather River in Butte County, and 3980 in Lake Cuyamaca near San Diego. There are no records available concerning the Feather River plant, but that in Lake Cuyamaca is reported as highly successful.

22. (2181). Stizostedion vitreum (Mitchill). Wall-eye; Wall-eyed Pike; Pike Perch.

In 1874 Livingston Stone transported 16 full-grown wall-eyed pike from the Missisquoi River, Vermont, and planted them on June 12 in the Sacramento River opposite Sacramento. All that is known of them is that a single specimen was caught in a slough not long afterward.

23. (2314). Huro floridana (Le Sueur). Straw Bass; Large-mouth Black Bass.

This species, and the small-mouthed Black Bass, Micropterus dolomieu, were brought to California from Lake Champlain, Vermont, and St. Joseph River, Michigan, by Livingston Stone in 1874. Some were placed in Napa Creek, and others in Alameda Creek. In 1879, 22 were put in Crystal Spring Reservoir of the Spring Valley Water Company. A sporting club also placed some in Lake Temescal, near Oakland. The large-mouth especially has flourished, and attains a size rarely if ever attained in the east except in Florida.

24. (2315). Micropterus dolomieu Lacépède. Small-mouth Black Bass.

The small-mouth bass was introduced earlier and in larger numbers than the large-mouth. It appears to have been brought to California in 1874 by Livingston Stone. The original lot consisted of 75 full-grown spawning bass from Lake Champlain, Vermont, and 24 small fish from St. Joseph River, Michigan. Two of the large fish and 12 of the small ones were lost in transit. The adult fish were placed in Napa Creek, where they were soon exterminated by anglers, and the immature ones were placed in Alameda Creek. The two species of black bass are not always distinguished, and appear to be generally lumped together in records and reports as "black bass." In 1895, from the land-locked overflow ponds of the Russian River 25,000 fry were collected and distributed among the various counties. The large-mouth, however, seems to be much the more common.

25. (2317). Apomotis cyanellus (Rafinesque). Green Sunfish.

The green sunfish was probably introduced into the State with the bluegill, Helioperca incisor. The two closely resemble each other when young, and are often found in the same waters. The two are usually associated in the accounts of fishes being introduced under the general term sunfishes. A. cyanellus does not attain a sufficient size to be of importance either for food or sport, and those brought in were probably mistaken for bluegills. A few sunfish were accidentally introduced with other fish into Lake Cuyamaca near San Diego, and sunfish obtained from that body of water were identified by Dr. Jordan as A. cyanellus.

26. (2331). Helioperca incisor (Cuvier & Valenciennes). Bluegill.

The date of introduction and number of individuals of this species is uncertain as they, along with the green sunfish, were introduced merely as sunfishes, about 1890 and 1891. Bluegills are now common and of large size and in many waters of the State.

27. (2342). Chœnobryttus gulosus (Cuvier & Valenciennes). Warmouth Bass.

Four hundred yearling Warmouth bass from Quincy, Illinois, were placed in Lake Cuyamaca in 1921, and 100 yearlings were deposited in Feather River, in Butte County near Gridley. Nothing has been heard of them since. of 12 fish delivered to the California Fish Commission in June, 1895, six were alive in December of the same year, in a pond in Sisson. Later these are reported to have died.

28. (2343). Ambloplites rupestris (Rafinesque). Red-eye; Rock Bass; Goggle-eye.

A plant of four full-grown rock bass from Vermont was made in Napa Creek on June 12, 1874, by Livingston Stone. Nothing has been heard of them since.

29. (2351). Pomoxis annularis Rafinesque. Crappie; White Crappie.

30. (2352). Pomoxis sparoides (Lacépède). Black Crappie; Calico Bass.

It is reported that both of these species have been introduced. In 1891, 285 yearlings were planted in Lake Cuyamaca, near San Diego. The account from which this report is taken states that most of the fishes distributed were *annularis*, but that it is certain that the other species was included. The black Crappie is, however, the one that seems to have survived in largest numbers. It reaches an immense size, larger than usual in its native home. Both species are now well established in several places in the State.

31. (2366). Roccus saxatilis (Walbaum). Striped Bass.

First introduced into California waters in July, 1879, when Livingston Stone planted about 135 of this species, brought from Navesink River, New Jersey, in Carquinez Strait at Martinez.

The Striped Bass introduction was a remarkable success from the start. The second and only other plant was made in 1882, when Mr. J. G. Woodbury of the California Fish Commission carried about 300 fish five to nine inches long from Shrewsbury River, New Jersey, to Suisun Bay, where they were deposited at Army Point. "Considering the small number of fish introduced and their remarkable increase in a few years, the result obtained from the introduction of the striped bass into California is one of the greatest feats of acclimatization of new species of fish in the history of fish culture." "Unquestionably, next to trout, the striped bass is the most popular game fish of northern California." (Scofield & Bryant.)

32. (2367). Lepibema chrysops (Rafinesque). White Bass.

Twelve yearing fish were transported from Quincy, Illinois, to the California Fish Commission at Sisson in June, 1925, and five of these were alive in December, to be used for breeding purposes, but all died during the year.