

APPENDIX C: Fish Species in Study Area

Section	Page
C1. List of Fish Species by Watershed and Fishing Area	C-2
C2. Field Guide to Fish Species by Fishing Area	C-4

C1. Freshwater and Estuarine Fishes Reported from Coastal Watersheds of Ventura and Los Angeles Counties (with Selected Surfzone Species Anticipated at Mouth of Mugu Lagoon.

Class	Order	Family	Species	Common Name	VR	SCR	CC	MC	LAR	SGR	Distribution in Study Area	Source
CEPHALASPIDOMORPHI												
PETROMYZONTIFORMES												
		Petromyzontidae										
			<i>Lampetra tridentata</i>	Pacific lamprey	TS	TSMS	--	TS	TS	--	CoastalTerraceWatershed	Swift (1993, pers. comm 2008)
CHONDRICHTHYES												
CHARCHARHINIFORMES												
		Triakidae										
			<i>Mustelus californicus</i>	gray smoothhound	Z	Z	Z	Z	E	E	surfzone; Estuaries; SGR	
			<i>Triakis semifasciatus</i>	leopard shark	Z	Z	Z	Z	E	E	surfzone; Estuaries;	Carlisle et al. (1960)
RAJIFORMES												
		Rhinobatidae										
			<i>Rhinobatos productus</i>	shovelnose guitarfish	Z	Z	Z	Z	E	E	surfzone; Estuaries;	Carlisle et al. (1960)
MYLIOBATIFORMES												
		Urolophidae										
			<i>Urobatis halleri</i>	round stingray	--	--	--	--	E	E	Estuaries; SGR	present study
		Myliobatidae										
			<i>Myliobatis californica</i>	bat ray	Z	Z	Z	Z	E	E	Estuaries; SGR	Carlisle ea. (1960); estuaries, PS
ACTINOPTERYGII												
ANGUILLIFORMES												
		Anguillidae										
			<i>Anguilla australis</i>	shortfin eel*	--	--	--	--	TD	TL	Puddingstone L, Legg Lake, lower LAR	Swift (1993)
CLUPEIFORMES												
		Engraulidae										
			<i>Anchoa compressa</i>	deepbody anchovy	--	--	E	E	E	E	estuaries: Mugu L, Malibu L, LAR, SGR	Swift (1993)
			<i>Anchoa delicatissima</i>	slough anchovy	--	--	--	--	E	E	estuaries of LAR, SGR	Swift (1993)
		Clupeidae										
			<i>Dorosoma petenense</i>	threadfin shad	WL	WL	WL	WL	WL	EWL	Coastal Watershed -- All; SGRE; lakes, res.	Swift (1993), Moyle (2002)
CYPRINIFORMES												
		Cyprinidae										
			<i>Carassius auratus</i>	goldfish	WSL	WSL	WSL	WSL	WSL	WSL	Coastal Watershed -- All; reser., CoastTer strms	Swift (1993), Moyle (2002)
			<i>Cyprinella lutrensis</i>	red shiner	--	--	--	--	TS	TL	CoastTerWS-All; Puddingstone L; Tujunga Creek	Swift (1993), Moyle (2002)
			<i>Cyprinus carpio</i>	common carp	WSL	WSL	WSL	WSL	WSLE	WSL	Coastal Watershed: All L,R;CTS; E in LAR	Swift (1993), Moyle (2002)
			<i>Gila orcuttii</i>	arroyo chub	WS	WS	WS	WS	WS	WS	Coastal Watersheds	Swift (1993),Moyle (2002), Lin and Ambrose (2005)
			<i>Lavinia exilicauda</i>	hitch	--	MSL	--	--	--	--	Sta Clara River; Pyramid Lake	Swift (1993)
			<i>Notemigonus crysoleucas</i>	golden shiner	WSL	WSL	WSL	WSL	WSL	WSL	Coastal Watershed -- All	Moyle (2002)
			<i>Orthodon microlepidotus</i>	Sacramento blackfish	--	MSL	--	--	TL	--	Reservoirs; Pyramid Lake; Echo Park Lake	Swift (1993),Moyle (2002)
			<i>Pimephales promelas</i>	fathead minnow	TSL	TSL	TSL	TSL	TSL	TSL	Coastal Terrace Watershed -- All	Moyle (2002)
			<i>Ptychocheilus grandis</i>	Sacramento pikeminnow	--	ML	--	--	--	--	Pyramid Lake	Swift (1993)
			<i>Rhinichthys osculus</i>	speckled dace	--	MS	--	--	MS	MS	Sta Clara, LA, San Gabriel R mountain streams	Swift (1993),Moyle (2002)
		Catostomidae										
			<i>Catostomus fumeiventris</i>	Owens sucker	--	MS	--	--	--	--	Sta Clara River (incl. Sespe C., Piru C.)	Swift (1993),Moyle (2002)
			<i>Catostomus santaanae</i>	Santa Ana sucker	--	MS	--	--	MS	MS	Sta Clara, LA, San Gabriel R - U CoastTer./Mts	Swift (1993),Moyle (2002)
SILURIFORMES												
		Ictaluridae										
			<i>Ameiurus catus</i>	white catfish	--	ML	--	--	--	--	Coastal Watershed: Pyramid and Castaic Lakes	Moyle (2002)
			<i>Ameiurus melas</i>	black bullhead	WSL	WSL	WSL	WSL	WSL	WSL	Coastal Watershed -- All; streams, rocky reser.	Moyle (2002)
			<i>Ameiurus natalis</i>	yellow bullhead	--	--	--	--	--	--	Coastal Terrace Watershed (Santa Ana R only)	Swift (1993),Moyle (2002)
			<i>Ameiurus nebulosus</i>	brown bullhead	--	--	--	--	--	--	Coastal Terrace Watershed (Sta Inez/StaAnaR)	Swift (1993),Moyle (2002)
			<i>Ictalurus furcatus</i>	blue catfish	WL	WL	WL	WL	WL	WL	Coastal Watershed: reservoirs, some UrbLakes	Swift (1993),Moyle (2002)
			<i>Ictalurus punctatus</i>	channel catfish	WSL	WSL	WSL	WSL	WSLE	WSL	Coastal Watershed -- All	Moyle (2002); E present
SALMONIFORMES												
		Salmonidae										
			<i>Oncorhynchus mykiss</i>	rainbow trout (steelhead)	WSL	WSL	WSL	WSL	WSL	WSL	Coastal Watershed -- All	Swift (1993),Moyle (2002)
			<i>Oncorhynchus tshawytscha</i>	chinook salmon	--	--	--	--	--	ED	Estuary-river mouth -- San Gabriel River	CDFG, pers. com. 2004
			<i>Salmo trutta</i>	brown trout	--	MS	--	--	MS	MS	U SCR, Piru Ck, Arroyo Seco-Bear Ck; U SGR	Swift (1993),Moyle (2002)
MUGILIFORMES												
		Mugilidae										
			<i>Mugil cephalus</i>	striped mullet	E	E	E	E	E	E	estuaries -- all;	Swift (1993),Moyle (2002)
ATHERINIFORMES												
		Atherinopsidae										
			<i>Atherinops affinis</i>	topsmelt	ZE	ZE	ZE	ZE	ZE	ZE	surfzone; estuaries -- all	Moyle (2002);Carlisle ea(1960)
			<i>Atherinopsis californiensis</i>	jacksmelt	Z	Z	Z	Z	E	E	surfzone; estuaries	Carlisle et al. (1960)
			<i>Mendia audens</i> (= <i>beryllina</i> , in part)	Mississippi silverside (= inland silverside, in part)	--	ML	--	--	--	--	Pyramid Lake, Castaic Lake; coastal watershd?	Moyle (2002), (Nelson et al. (2004) (<i>audens</i>))
CYPRINODONTIFORMES												
		Fundulidae										
			<i>Fundulus parvipinnis</i>	California killifish	E	E	E	E	E	E	estuaries -- all	Moyle (2002)
			<i>Lucania parva</i>	rainwater killifish	--	--	--	--	TS	--	Arroyo Seco Crk; lakes/estuaries (SB, Riv., OC)	Swift (1993),Moyle (2002)
		Poeciliidae										
			<i>Gambusia affinis</i>	western mosquitofish	TSL	TSL	TSL	TSL	TSL	TSL	Coastal Terrace Watershed -- All	Swift (1993),Moyle (2002)
			<i>Poecilia latipinna</i>	saifin molly	ED	ED	ED	ED	ED	ED	sloughs, estuaries -- Ven, LA Counties	Moyle (2002)
GASTEROSTEIFORMES												
		Gasterosteidae										
			<i>Gasterosteus aculeatus</i>	threespine stickleback	WS	WS	--	TS	MS	MS	CoastWS (VR,SCR), Malibu Ck, up (LAR,SGR)	Swift (1993),Moyle (2002)

C1. (Continued)

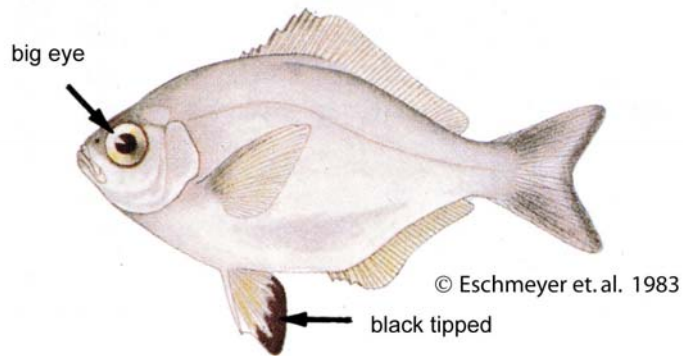
Class	Order	Family	Species	Common Name	VR	SCR	CC	MC	LAR	SGR	Distribution in Study Area	Source
PERCIFORMES												
Moronidae												
			<i>Morone saxatilis</i>	striped bass	--	ML	--	--	--	--	Reservoirs w Aqueduct Water; Pyramid Lake	Swift (1993), Moyle (2002)
Serranidae												
			<i>Paralabrax clathratus</i>	kelp bass	--	--	--	--	E	E	Estuaries; SGR	present study
			<i>Paralabrax maculatofasciatus</i>	spotted sand bass	--	--	--	--	E	E	Estuaries; SGR	present study
			<i>Paralabrax nebulifer</i>	barred sand bass	Z	Z	Z	Z	E	E	Surfzone; Estuaries; SGR	present study; Carlisle (1960)
Centrarchidae												
			<i>Lepomis cyanellus</i>	green sunfish	WSL	WSL	WSL	WSL	WSL	WSL	Coastal Watershed -- All; strms, pnds, reserv.	Swift (1993), Moyle (2002)
			<i>Lepomis gulosus</i>	warmouth	--	--	--	--	--	--	Possibly in reservoirs w Aqueduct Water	Moyle (2002)
			<i>Lepomis macrochirus</i>	bluegill	WL	WL	WL	WL	WL	WL	Coastal Watershed -- All; ponds, reservoirs	Swift (1993), Moyle (2002)
			<i>Lepomis microlophus</i>	redear sunfish	WL	WL	WL	WL	WL	WL	Coastal Watershed -- All	Moyle (2002)
			<i>Micropterus dolomieu</i>	smallmouth bass	--	ML	--	--	--	ML	Var. SC streams; Morris Dam; Pyramid Lake	Swift (1993), Moyle (2002)
			<i>Micropterus salmoides</i>	largemouth bass	TML	TML	--	--	TML	TML	Reservoirs; some urban lakes	Swift (1993), Moyle (2002)
			<i>Pomoxis annularis</i>	white crappie	WSL	WSL	WSL	WSL	WSL	WSL	Coastal Watershed -- All	Moyle (2002)
			<i>Pomoxis nigromaculatus</i>	black crappie	MTL	MTL	MTL	MTL	MTL	MTL	Coastal Watershed -- All; reservoirs	Swift (1993), Moyle (2002)
Percidae												
			<i>Percina macrolepida</i>	bigscale logperch	--	ML	--	--	--	--	Castaic Lake; Pyramid Lake	Swift (1993), Moyle (2002)
Sciaenidae												
			<i>Genyonemus lineatus</i>	white croaker	Z	Z	Z	Z	E	E	surfzone; estuaries; LAR	Carlisle et al. (1960); PS;
			<i>Menticirrhus undulatus</i>	California corbina	Z	Z	Z	Z	E	E	surfzone; estuaries; LAR	Carlisle et al. (1960); PS
			<i>Roncador stearnsii</i>	spotfin croaker	Z	Z	Z	Z	E	E	surfzone; estuaries	Carlisle et al. (1960); PS
			<i>Serphus politus</i>	queenfish	Z	Z	Z	Z	E	E	surfzone; estuaries	Carlisle et al. (1960); PS
			<i>Umbrina roncador</i>	yellowfin croaker	Z	Z	Z	Z	E	E	surfzone; estuaries; LAR	Carlisle et al. (1960); PS
Cichlidae												
			<i>Oreochromis aureus</i>	blue tilapia	--	--	--	--	--	ED	San Gabriel River?	Swift (pers. comm.)
			<i>Oreochromis mossambicus</i>	Mozambique tilapia	--	--	--	--	TL	ED	LAR (Sepulveda Basin), SGR; Sta. Ana River	Swift (1993), Moyle (2002)
			<i>Tilapia zillii</i>	redbelly tilapia	--	--	--	--	--	ED	some southern California localities; SG River?	Moyle (2002); Swift (pc)
Embiotocidae												
			<i>Amphistichus argenteus</i>	barred surfperch	Z	Z	Z	Z	E	E	surfzone - all	Carlisle et al. (1960)
			<i>Cymatogaster aggregata</i>	shiner perch	Z	Z	Z	Z	E	E	estuaries -- all	Moyle (2002)
			<i>Embiotoca jacksoni</i>	black perch	Z	Z	Z	Z	E	E	surfzone; LAR/SGR estuaries	present study
			<i>Hyperprosoon anale</i>	spotfin surfperch	Z	Z	Z	--	--	--	surfzone Santa Barbara Channel;	M. J. Allen (SCCWRP)
			<i>Hyperprosoon argenteum</i>	walleye surfperch	Z	Z	Z	Z	E	E	surfzone - all	Carlisle et al. (1960)
			<i>Hysteroecarpus traskii</i>	tule perch	--	ML	--	--	--	--	Pyramid Lake	Swift (1993), Moyle (2002)
			<i>Phanerodon furcatus</i>	white seaperch	Z	Z	Z	Z	E	E	surfzone; LAR/SGR estuaries	Carlisle et al. (1960)
			<i>Rhacochilus toxotes</i>	rubbreilp seaperch	Z	Z	Z	Z	E	E	surfzone; LAR/SGR estuaries	Carlisle et al. (1960)
			<i>Rhachilus vacca</i>	pile perch	Z	Z	Z	Z	E	E	surfzone; LAR/SGR estuaries	Carlisle et al. (1960); PS
Gobiidae												
			<i>Acanthogobius flavimanus</i>	yellowfin goby	--	--	E	E	E	E	estuaries -- from (Pt. Mugu) south	Moyle (2002) (MJA)
			<i>Clevalandia ios</i>	arrow goby	E	E	E	E	E	E	estuaries -- all; Sta Clara R, S Gabriel R	Swift (1993)
			<i>Eucyclogobius newberryi</i>	tidewater goby	D	D	--	D	--	--	lagoons of coastal streams; VR, SCR, MC	Moyle (2002)
			<i>Gillichthys mirabilis</i>	longjaw mudsucker	E	E	E	E	E	E	estuaries; VR, SCR, MC	Moyle (2002)
			<i>Tridentiger bifasciatus</i>	shimofuri goby	--	MLS	--	--	--	--	Pyramid Lake, Piru Creek below reservoir	Moyle (2002)
Scombridae												
			<i>Scomber japonicus</i>	Pacific chub mackerel	--	--	--	--	E	--	estuaries; LAR	present study
PLEURONECTIFORMES												
Paralichthyidae												
			<i>Paralichthys californicus</i>	California halibut	ZE	ZE	ZE	ZE	ZE	ZE	estuaries -- Malibu Lagoon, SGR	Swift (1993); Carlisle ea (1960)
Pleuronectidae												
			<i>Pleuronichthys guttulatus</i>	diamond turbot	E	E	E	E	E	E	estuaries -- all	Swift (1993)

W = Coastal watershed (mouth to mountain streams) Note: Fishing area abbreviation in caps, species common there; small letters, occasional; bold - reported in this study.
 T = Coastal terrace water shed (mouth to base of foothills)
 E = Estuarine species are those that can be found in low salinity or freshwater.
 M = mountain; D = mouth (delta); S = streams/rivers; L = lakes/reservoirs; Z = Surfzone; bold and PS = in present study;
 Watershed Abbreviations: VR = Ventura River; SCR = Santa Clara River; CC = Calleguas Creek; MC = Malibu Creek; LAR = Los Angeles River; SGR = San Gabriel River;
 Common and scientific names of fish species are those of Nelson et al. (2004)
 * Common name from Robins et al. (1991)

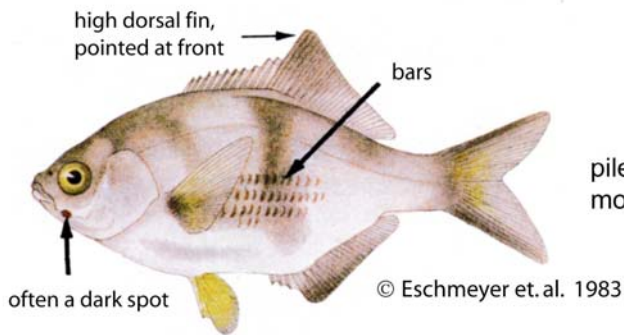
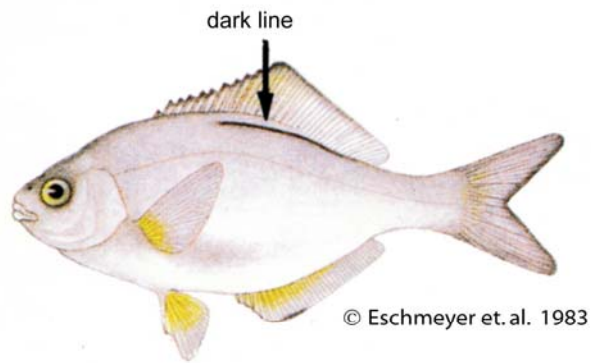
**C2. Field Guide to Selected Fish Species in Ventura and Los Angeles
County Watersheds by Fishing Area**

Surfzone 1 of 5

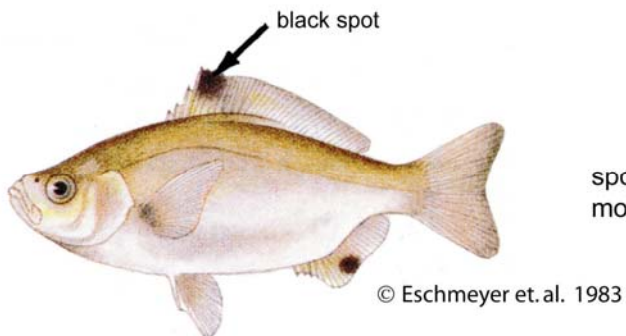
walleye surfperch (*Hyperprosopon argenteum*)
mojarra ojona <=30 cm.



white seaperch (*Phanerodon furcatus*)
mojarra loma rayado <=32 cm.



pile perch (*Rhacochilus vacca*)
mojarra muellera <=44 cm.



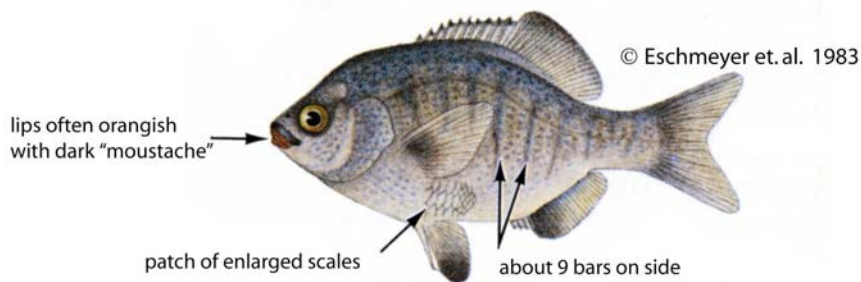
spotfin surfperch (*Hyperprosopon anale*)
mojarra aletimanchada <=20 cm.

Surfzone 2 of 5



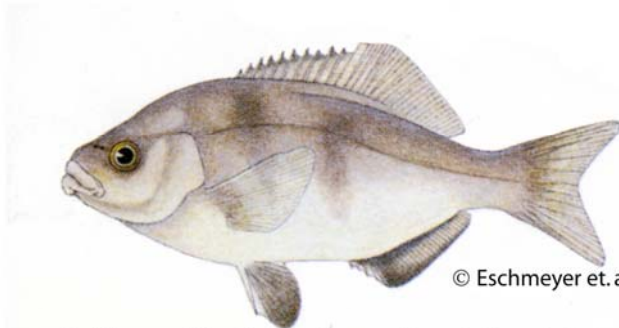
© 1979 Wydoski and Whitney

shiner perch (*Cymatogaster aggregata*) mojarra brillante ≤ 23.5 cm FL



© Eschmeyer et. al. 1983

black perch (*Embiotoca jacksoni*) mojarra negra ≤ 39 cm.



© Eschmeyer et. al. 1983

rubberlip seaperch (*Rhacochilus toxotes*) mojarra labios de hule ≤ 47 cm.



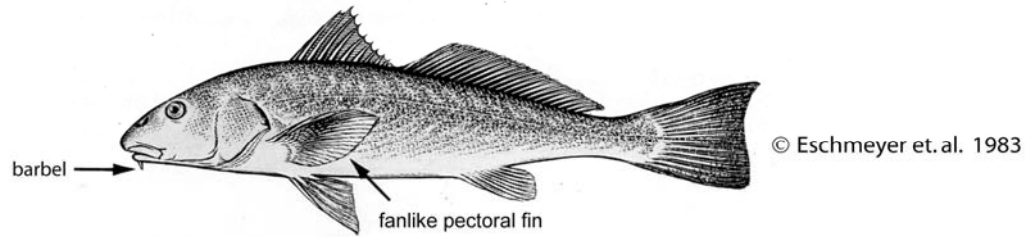
© Milton Love

barred surfperch (*Amphistichus argenteus*)....mojarra de bandas.... ≤ 43 cm TL

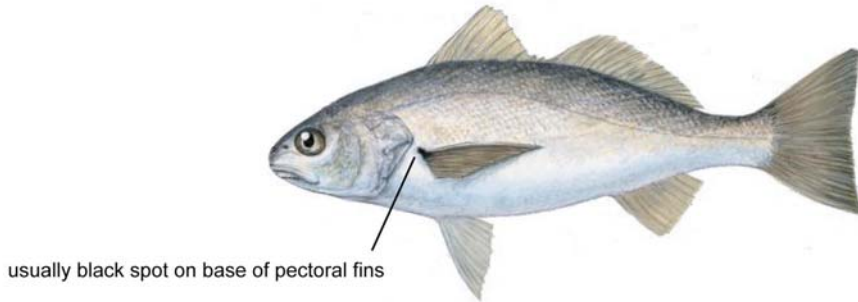
barred surfperch photo from:

<http://hmsc.oregonstate.edu/projects/msap/PS/masterlist/fish/barredsurfperch.html>.

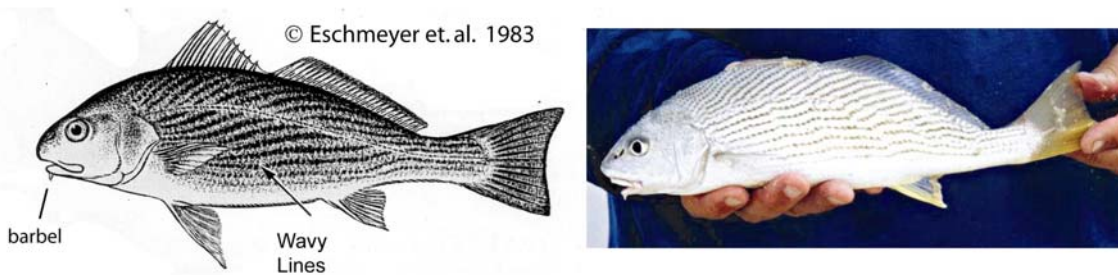
Surfzone 3 of 5



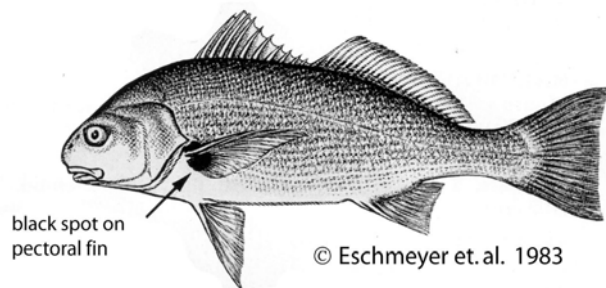
California corbina (*Menticirrhus undulatus*) berrugato californiano <=71 cm.



white croaker (*Genyonemus lineatus*) corvineta blanca <=41 cm.



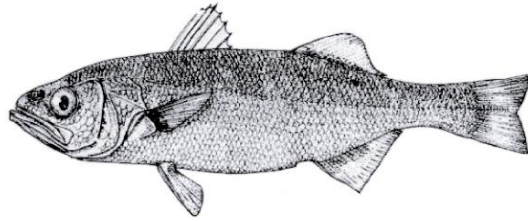
yellowfin croaker (*Umbrina roncadorensis*) berrugata aleta amarilla <=51 cm



spotfin croaker (*Roncadorensis stearnsii*) roncadorensis aleta manchada <=69 cm.

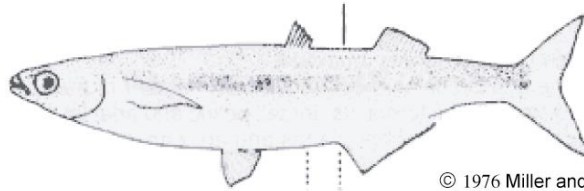
White croaker illustration from: <http://www.pvsfish.org/>, yellowfin croaker photo by: John Snow, <http://www.bajadestinations.com/fishid/croakyyellowfin/croakyyellowfin.htm>

Surfzone 4 of 5



queenfish (*Seriphus politus*) corvineta reina ≤ 30 cm.

10-12 scales between dorsal fins



© 1976 Miller and Lea

insertion of dorsal fin well in advance of beginning of anal fin

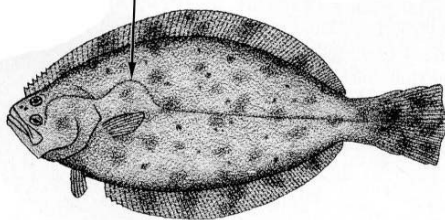
jacksmelt (*Atherinops californiensis*) pejerry mocho ≤ 44 cm



© 1987 Fish and Game

barred sand bass (*Paralabrax nebulifer*) cabrilla verde de arena ≤ 65 cm

arched



California halibut (*Paralichthys californicus*) lenguado californiano ≤ 152 cm.

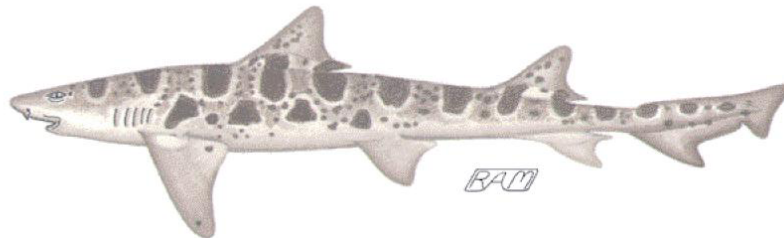
Queenfish illustration from:

[http://www.fishbase.org/Photos/PicturesSummary.cfm?ID=3589&what=species,](http://www.fishbase.org/Photos/PicturesSummary.cfm?ID=3589&what=species)

Surfzone 5 of 5



gray smoothhound (*Mustelus californicus*)Cazón mamón <=160 cm



leopard shark (*Triakis semifasciata*) tiburón leopardo <=210 cm



bat ray (*Myliobatis californica*) tecolote <=180 cm

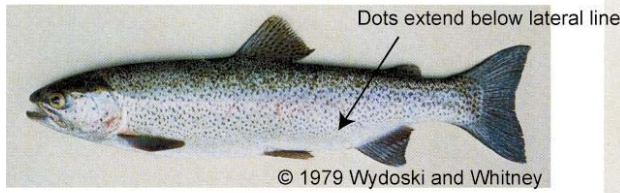


shovelnose guitarfish (*Rhinochimaera productus*) guitarra viola <=170 cm

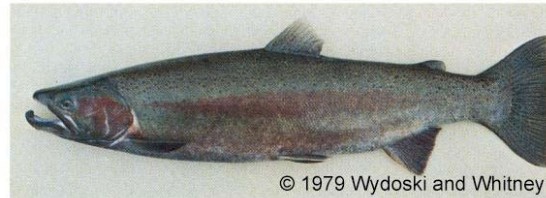
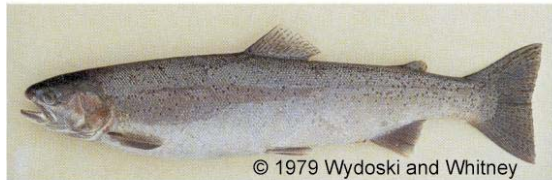
Smoothhound photo from: <http://www.sdnhm.org/kids/sharks/shore-to-sea/smoothhound.html>,

leopard shark drawing from: http://www.elasmobranch-research.org/education/shark_profiles/zebra.htm.

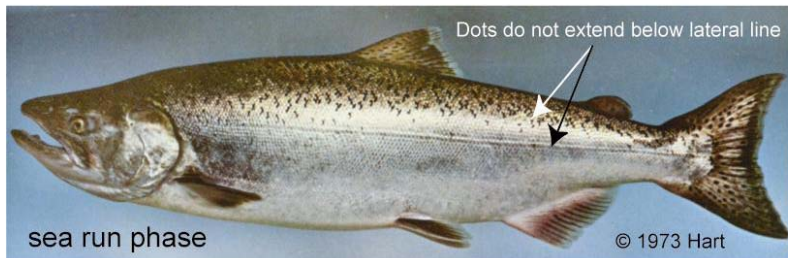
Estuaries 1 of 6



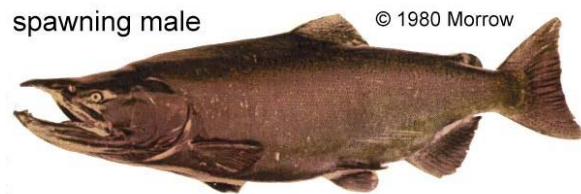
rainbow trout (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI



steelhead (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI



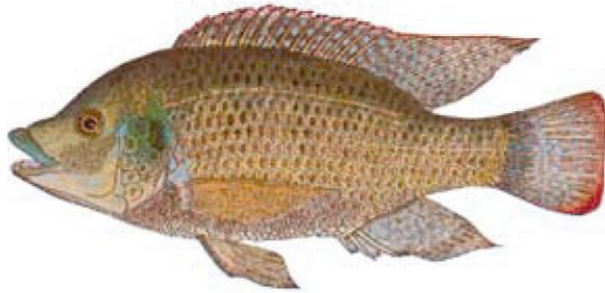
chinook salmon (*Oncorhynchus tshawytscha*) ≤ 147 cm TL



chinook salmon (*Oncorhynchus tshawytscha*) ≤ 147 cm TL

Estuaries 2 of 6

Los Angeles
and
San Gabriel
Rivers:



Mozambique tilapia (*Oreochromis mossambicus*) ... tilapia mosambica <= 38 cm TL

San Gabriel River:



blue tilapia (*Oreochromis aureus*) ... tilapia azul <= 37 cm SL

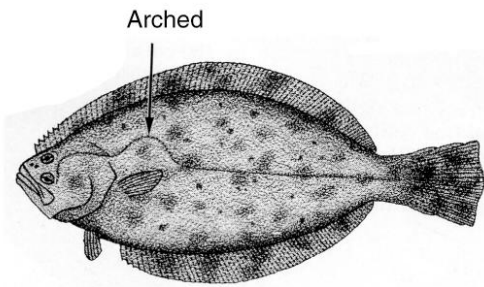


redbelly tilapia (*Tilapia zillii*) <= 32 cm TL

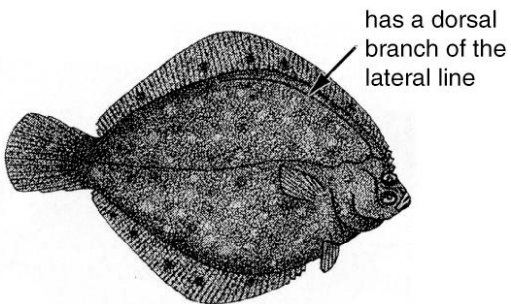


Mozambique tilapia illustration from: <http://www.fishingowl.co.za/freshwater1.html>, blue tilapia photo from: http://www.ittiofauna.org/webmuseum/pesciossei/perciformes/cichlidae/oreochromis/oreochromis_aureus/oreochromis_aureus_big.htm, redbelly tilapia photo from http://www.ittiofauna.org/webmuseum/pesciossei/perciformes/cichlidae/tilapia/tilapia_zillii/tilapia_zillii_big.htm and http://home.arcor.de/welse/pics_t_zillii.html.

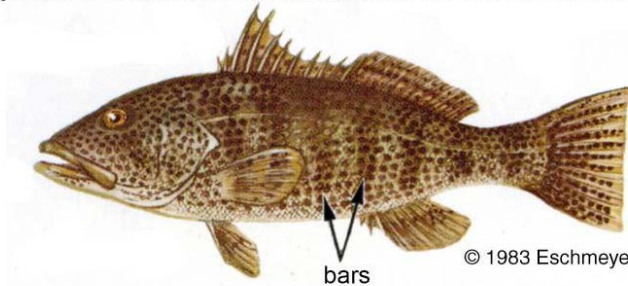
Estuaries 3 of 6



California halibut (*Paralichthys californicus*) lenguado californiano ≤ 152 cm FL



diamond turbot (*Pleuronichthys auttulatus*) platiia diamante ≤ 46 cm FL



© 1983 Eschmeyer et. al.

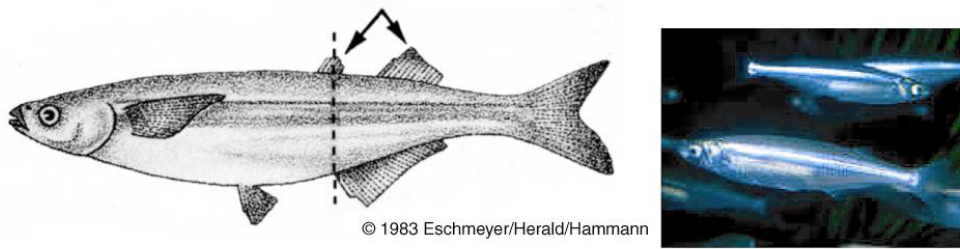
spotted sandbass (*Paralabrax maculatofasciatus*) cabrilla de roca ≤ 56 cm TL



shiner perch (*Cymatogaster aggregata*) mojarra brillante ≤ 23.5 cm FL

Halibut and turbot photos from
<http://departments.oxy.edu/tops/marinebio/organisms/PH14turbot.htm>.

Estuaries 4 of 6

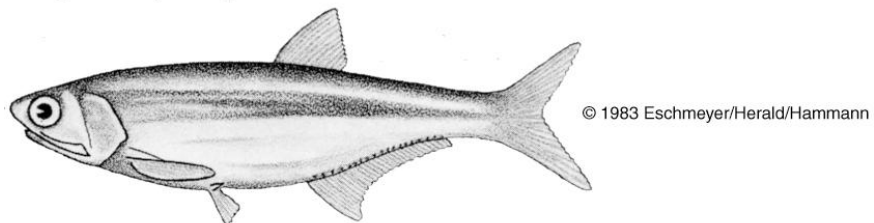


topsmelt (*Atherinops affinis*) (anal fin begins below 1st dorsal fin)
.... pejerrey pescadillo ≤ 37 cm



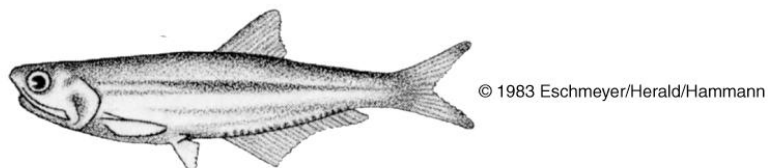
striped mullet (*Mugil cephalus*) lisa rayada ≤ 62 cm SL

Estuaries of Los Angeles (L.A.) and San Gabriel River:



deepbody anchovy (*Anchoa compressa*) (29 or more anal fin rays)
.... anchoa alta ≤ 16 cm FL

Estuaries of Calleguas and Malibu Creek, L.A. and San Gabriel River:



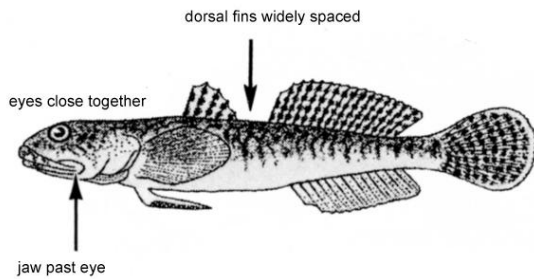
slough anchovy (*Anchoa delicatissima*) (23-26 anal fin rays)
.... anchoa delicada ≤ 9.5 cm FL

Topsmelt photo from: <http://www.wetwebmedia.com/marine/fishes/>.

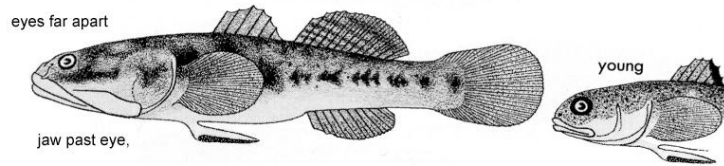
Estuaries 5 of 6



Pacific staghorn sculpin (*Leptocottus armatus*) charrasco de astas ≤ 46 cm TL

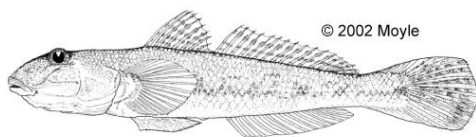


arrow goby (*Clevelandia eos*) gobio flecha ≤ 5.7 cm TL



longjaw mudsucker (*Gillichthys mirabilis*) chupalodo grande ≤ 15 cm TL

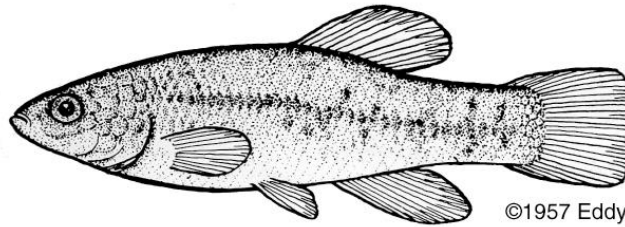
Not recorded at Ventura or Santa Clara Rivers:



yellowfin goby (*Acanthogobius flavimanus*) gobio extranjero ≤ 30 cm TL

Arrow goby and longjaw mudsucker illustrations from:© 1983 Eschmeyer/Herald/Hamman.

Estuaries 6 of 6



California killifish (*Fundulus parvipinnis*) sardinilla chococo ≤ 9 cm SL



sailfin molly (*Poecilia latipinna*) topote velo negro ≤ 15 cm TL

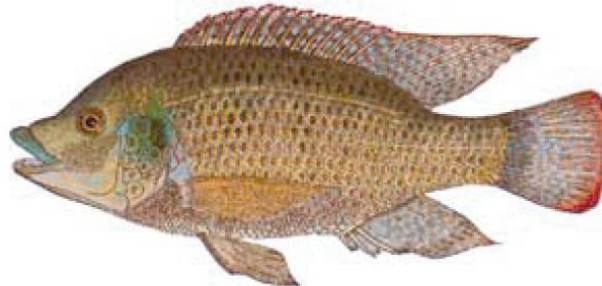
Sailfin molly from: http://sofia.usgs.gov/geer/2003/posters/lh_hydropd/sailfinx.jpg.

River Mouth (delta) 1 of 3



common carp (*Cyprinus carpio*) carpa común ≤ 80 cm SL

Los Angeles
and
San Gabriel
rivers:



Mozambique tilapia (*Oreochromis mossambicus*) tilapia mosambica ≤ 38 cm TL

San Gabriel River:



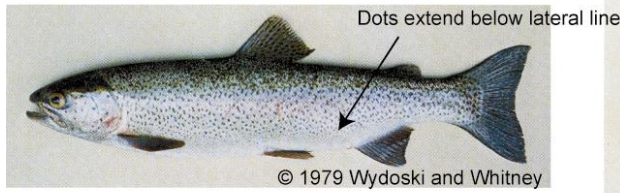
redbelly tilapia (*Tilapia zillii*) ≤ 32 cm TL (Peterson)



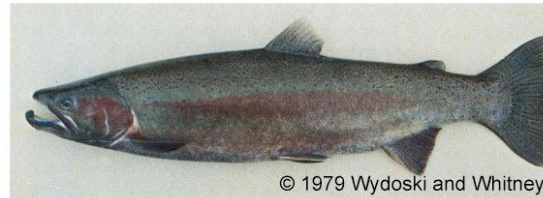
blue tilapia (*Oreochromis aureus*) tilapia azul ≤ 37 cm SL

Mozambique tilapia illustration from: <http://www.fishingowl.co.za/freshwater1.html>, blue tilapia photo from: http://www.ittiofauna.org/webmuseum/pesciossei/perciformes/cichlidae/oreochromis/oreochromis_aureus/oreochromis_aureus_big.htm, redbelly tilapia photo from http://www.ittiofauna.org/webmuseum/pesciossei/perciformes/cichlidae/tilapia/tilapia_zillii/tilapia_zillii_big.htm and http://home.arcor.de/welse/pics_t_zillii.html.

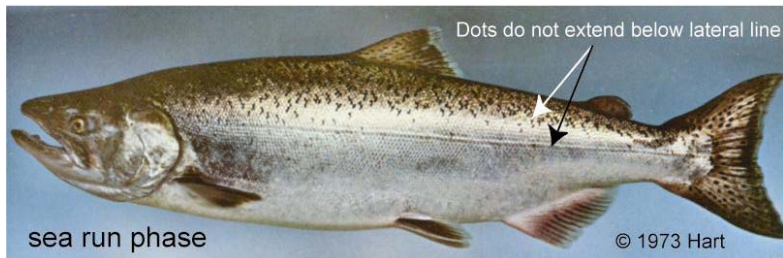
River Mouth (delta) 2 of 3



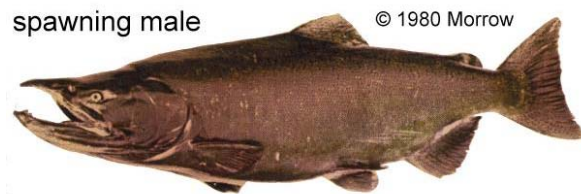
rainbow trout (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI



steelhead (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI



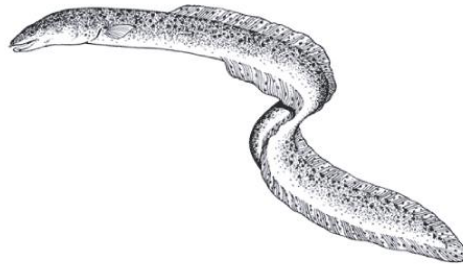
chinook salmon (*Oncorhynchus tshawytscha*) ≤ 147 cm TL



chinook salmon (*Oncorhynchus tshawytscha*) ≤ 147 cm TL

River Mouth (delta) 3 of 3

At Los Angeles and San Gabriel Rivers:



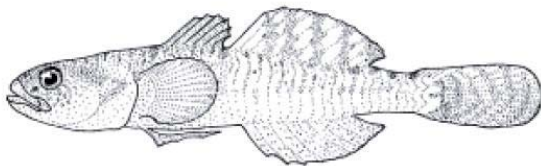
short finned eel (*Anguilla australis*).... ≤ 110 cm TL

At all rivers:



sailfin molly (*Poecilia latipinna*) topote velo negro ≤ 15 cm TL

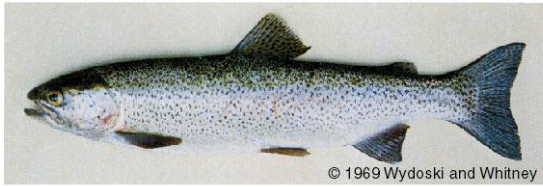
At Ventura, Santa Clara rivers, and Malibu Creek:



tidewater goby (*Eucyclogobius newberryi*) ≤ 5 cm SL

Sailfin molly photo from: http://sofia.usgs.gov/geer/2003/posters/lh_hydropd/sailfinx.jpg.
short finned eel illustration from <http://www.dpi.qld.gov.au/fishweb/2181.html>, tidewater goby illustration
from: http://meso.spawar.navy.mil/Newsltr/Fy01/No_1/goby.html, tidewater goby photo from:
<http://www.nps.gov/goga/parklabs/library/wildlifeguide/fish/tidewatergoby.htm>.

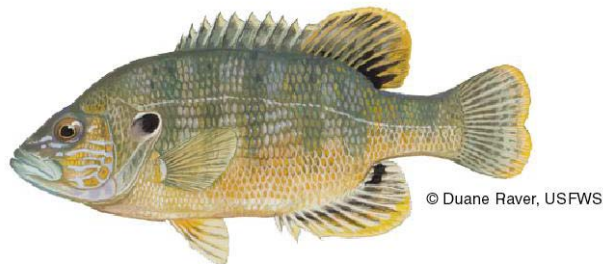
Coastal Terrace Streams 1 of 5



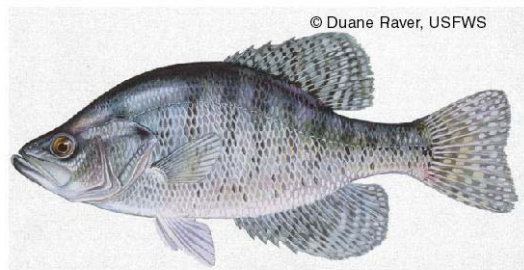
rainbow trout (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI



steelhead (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI



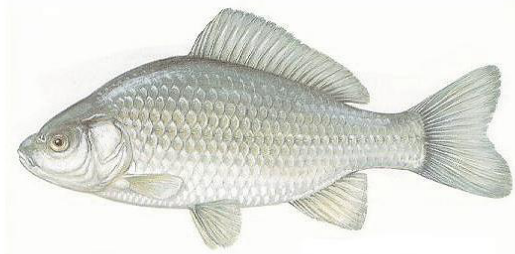
green sunfish (*Lepomis cyanellus*) pez sol ≤ 30 cm SL



white crappie (*Pomoxis annularis*) ≤ 53 cm TL

White crappie illustration from: <http://training.fws.gov/bart/ravercd.html>.

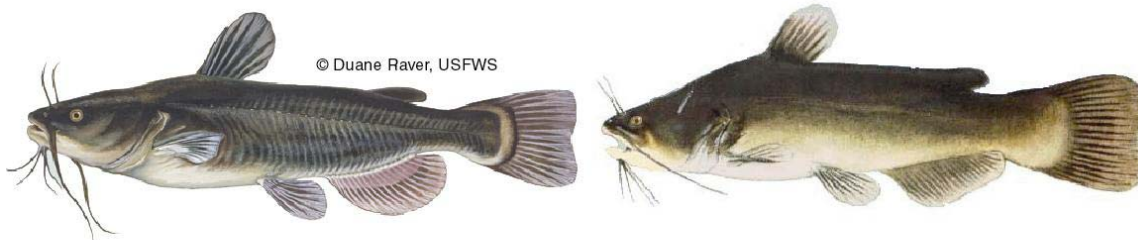
Coastal Terrace Streams 2 of 5



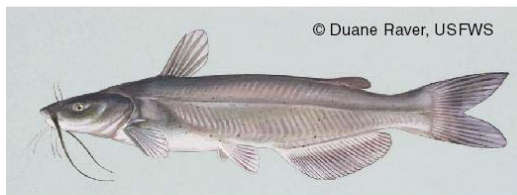
goldfish (*Carassius auratus*) carpa dorada ≤ 30 cm SL



common carp (*Cyprinus carpio*) carpa común ≤ 80 cm SL



black bullhead (*Ameiurus melas*) bagre torito negro ≤ 61 cm TL



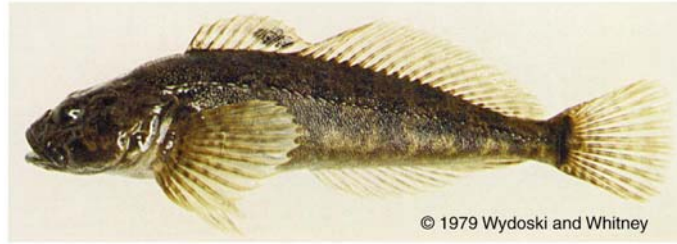
(24-29 anal fin rays)

channel catfish (*Ictalurus punctatus*) bagre de canal ≤ 100 cm TL

Goldfish image from: <http://www.fsz.bme.hu/~pink/webpeca/halak/ezust.jpg>, second black bullhead illustration from <http://www.tpwd.state.tx.us/fish/infish/species/bbh/bigfish.htm>. Young channel catfish: <http://training.fws.gov/bart/ravercd.html>, mature channel catfish illustration from <http://www.dec.state.ny.us/website/dfwmr/fish/fishspecs/channelcatfish.gif>.

Coastal Terrace Streams 3 of 5

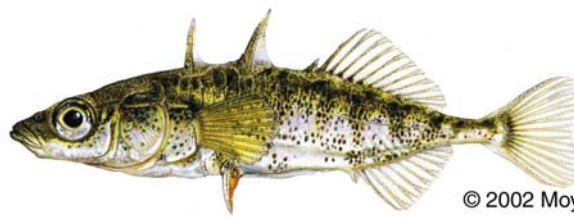
Recorded at
Ventura
and Santa Clara River



© 1979 Wydoski and Whitney

prickly sculpin (*Cottus asper*) ≤ 20 cm SL

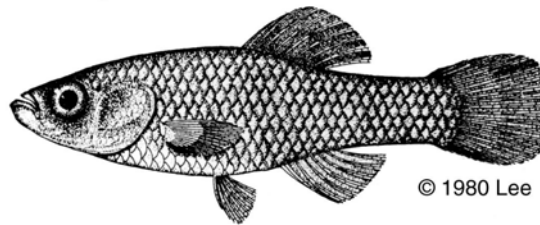
Recorded at all rivers except Calleguas Creek:



© 2002 Moyle

threespine stickleback (*Gasterosteus aculeatus*) espinucho ≤ 8 cm TL

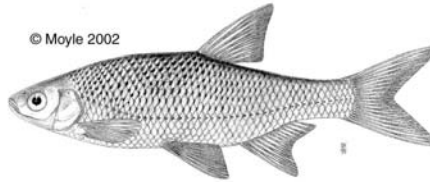
Only recorded at Los Angeles River:



© 1980 Lee

rainwater killifish (*Lucania parva*) sardinilla de lluvia ≤ 6 cm SL

Coastal Terrace Streams 4 of 5



© Moyle 2002

golden shiner (*Notemigonus crysoleucas*) <= 26 cm SL

FEMALE

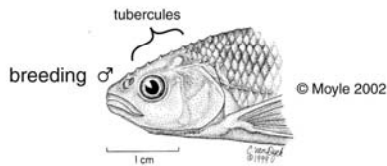


MALE



fathead minnow (*Pimephales promelas*) carpita cabeza <= 11 cm TL
(1st dorsal spine short compared to rest of dorsal fin.)

Recorded at Los Angeles and San Gabriel Rivers:



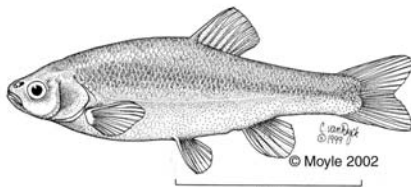
breeding ♂

tubercles

© Moyle 2002

red shiner (*Cyprinella lutrensis*) carpita roja <= 8 cm SL

Recorded at all Rivers

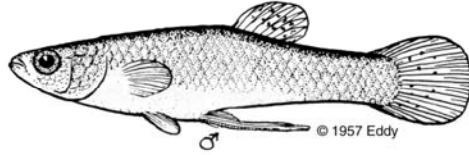
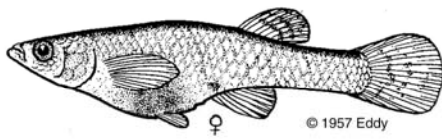


4 cm

Arroyo chub (*Gila orcutti*) (breeding male has tubercles on head) <= 9 cm SL

Golden shiner picture from http://www.fcps.k12.va.us/StratfordLandingES/Ecology/mpages/golden_shiner.htm, fathead minnows illustrations from <http://www.walleysunlimited.com/adopt-fish/fish-fatheadminnow.html>. Whole red shiner illustration from: <http://www.iowadnr.com/fish/iafish/rds-card.html> Red shiner pictures from: http://www.biology.ucok.edu/SelmanLL/SelmanFishPage/fish%20list%20with%20images_files/traders%20creek%20fishes.htm. Arroyo chub picture from http://www.dfg.ca.gov/hcpb/cgi-bin/read_one.asp?specy=fish&idNum=23.

Coastal Terrace Streams 5 of 5



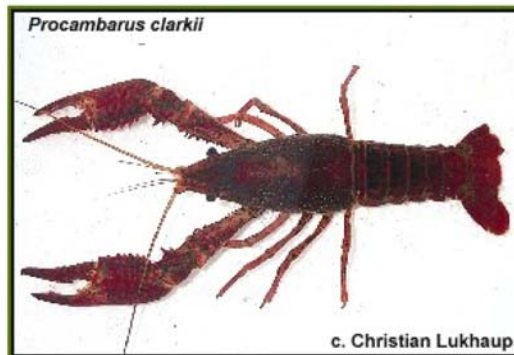
western mosquitofish (*Gambusia affinis*) guayacón mosquito ≤ 6.5 cm TL



Pacific lamprey (*Lampetra tridentata*) lamprea del Pacífico ≤ 76 cm TL



Asian clam (*Corbicula fluminea*) $\leq 50-60$ mm TL



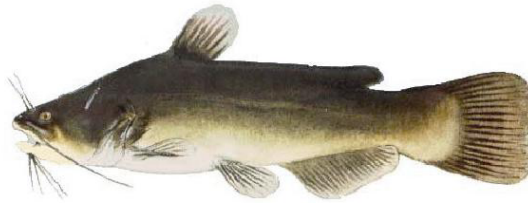
red swamp crayfish (*Procambarus clarkia*)....camarón del Diablo...
 $\leq 25-60$ mm CL

Asian clam photo from www.gpnc.org/unionid.htm; red swamp crayfish (*Procambarus clarkia*) photo from www.crayfishworld.com/internationalcraysUSA5.htm

Urban Lakes 1 of 6



© Duane Raver, USFWS



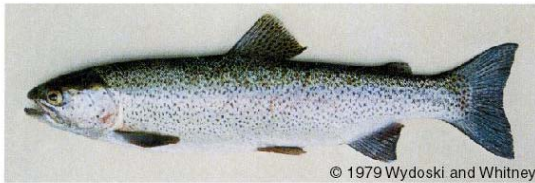
black bullhead (*Ameiurus melas*) bagre torito negro ≤ 61 cm TL



© Duane Raver, USFWS



channel catfish (*Ictalurus punctatus*) (24-29 anal fin rays) bagre de canal ≤ 100 cm TL

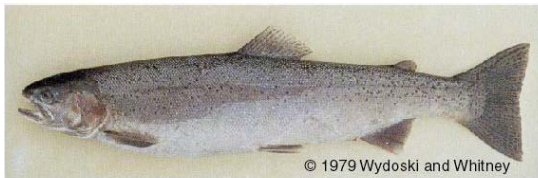


© 1979 Wydoski and Whitney



© 1979 Wydoski and Whitney

rainbow trout (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI



© 1979 Wydoski and Whitney

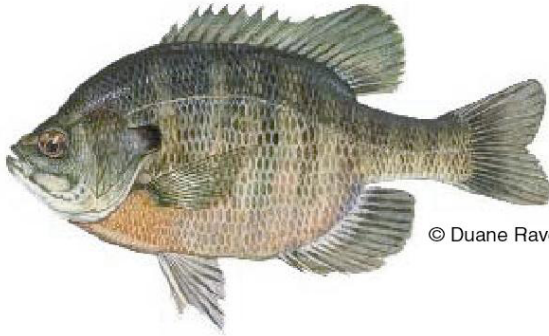


© 1979 Wydoski and Whitney

steelhead (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI

Right bullhead illustration from <http://www.tpwd.state.tx.us/fish/infish/species/bbh/bigfish.htm>, channel catfish from <http://training.fws.gov/bart/ravercd.html> and <http://www.dec.state.ny.us/website/dfwmr/fish/fishspecs/channelcatfish.gif>,

Urban Lakes 2 of 6



bluegill (*Lepomis macrochirus*)
mojarra oreja azul ≤ 41 cm TL

© Duane Raver, USFWS



redear sunfish (*Lepomis microlophus*)
mojarra oreja roja ≤ 25 cm TL

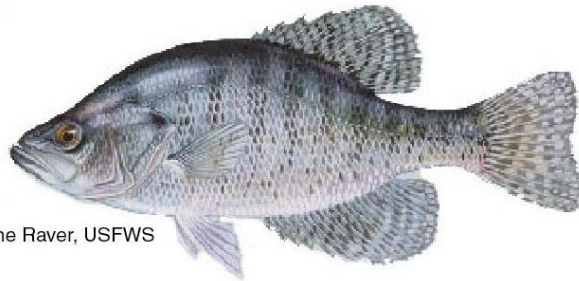
© Duane Raver, USFWS

black crappie (*Pomoxis nigromaculatus*)
.... mojarra negra ≤ 49 cm TL



© 1979 Wydoski and Whitney

white crappie (*Pomoxis annularis*)
.... ≤ 53 cm TL



© Duane Raver, USFWS

Bluegill, redear sunfish, and white crappie illustrations from:
<http://training.fws.gov/bart/ravercd.html>.

Urban Lakes 3 of 6



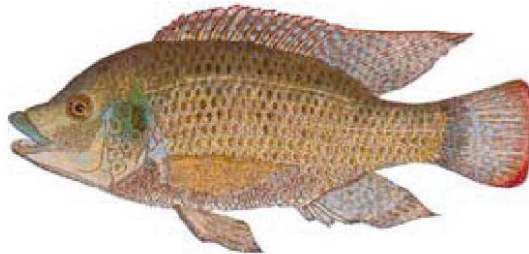
green sunfish (*Lepomis cyanellus*) pez sol ≤ 30 cm SL

Recorded at lakes of the Ventura, Santa Clara, Los Angeles, and San Gabriel Rivers



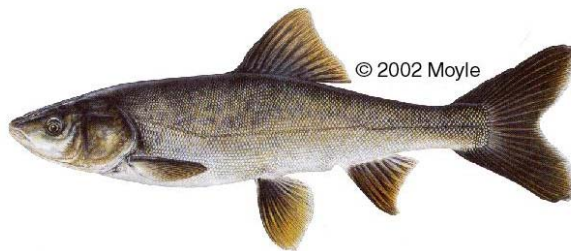
largemouth bass (*Micropterus salmoides*) lobina negra ≤ 76 cm TL

Recorded at lakes of Los Angeles and San Gabriel Rivers



Mozambique tilapia (*Oreochromis mossambicus*) tilapia mosambica ≤ 38 cm TL

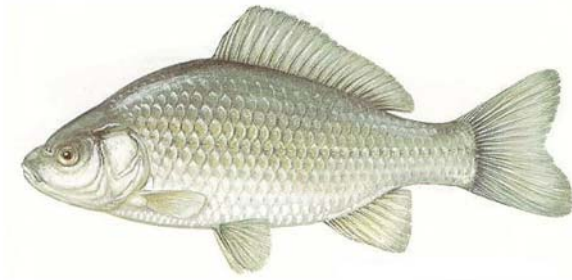
Recorded at lakes of Santa Clara and Los Angeles River (especially Echo Park Lake):



Sacramento blackfish (*Orthodon microlepidotus*) ≤ 50 cm FL

Largemouth bass illustration from <http://training.fws.gov/bart/ravercd.html>. Mozambique tilapia illustration from: <http://www.fishingowl.co.za/freshwater1.html>.

Urban Lakes 4 of 6



goldfish (*Carassius auratus*) carpa dorada ≤ 30 cm SL



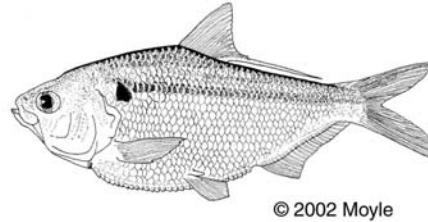
common carp (*Cyprinus carpio*) carpa común ≤ 80 cm SL

Recorded at
Lakes of the
Ventura and the
Santa Clara
Rivers

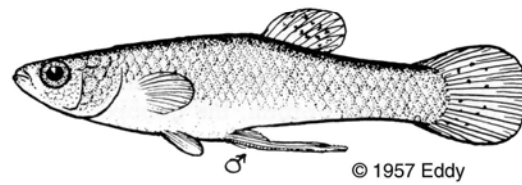
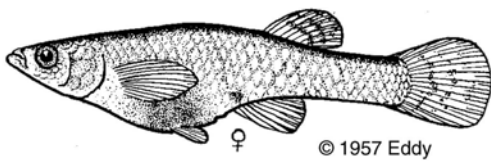


prickly sculpin (*Cottus asper*) ≤ 20 cm SL

Urban Lakes 5 of 6

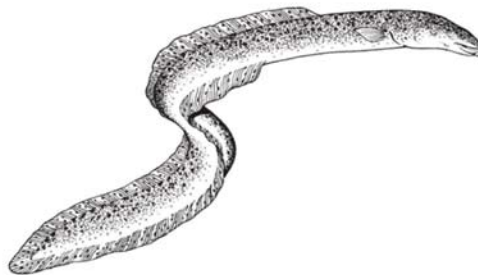


threadfin shad (*Dorosoma pretenense*) sardina maya ≤ 22 cm TL



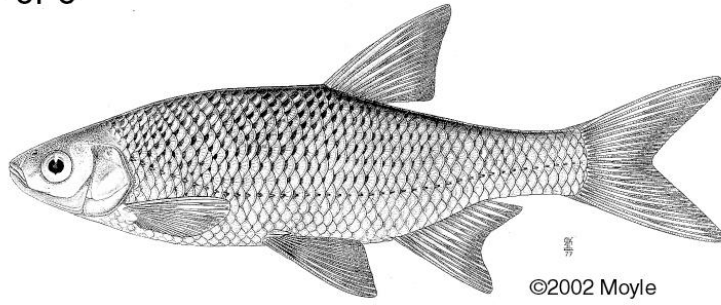
western mosquitofish (*Gambusia affinis*) guayacón mosquito ≤ 6.5 cm TL

Puddingstone and
Legg Lake



short finned eel (*Anguilla australis*)

Urban Lakes 6 of 6

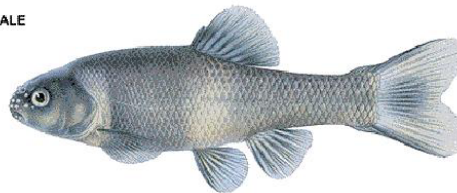


golden shiner (*Notemigonus crysoleucas*) <= 26 cm SL

FEMALE

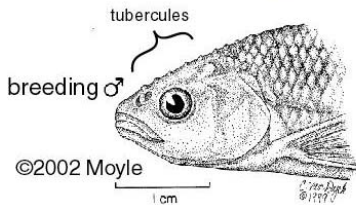


MALE



fathead minnow (*Pimephales promelas*) carpita cabezona <= 11 cm TL

Recorded at lakes of Los Angeles and San Gabriel Rivers
(especially Puddingstone Lake):

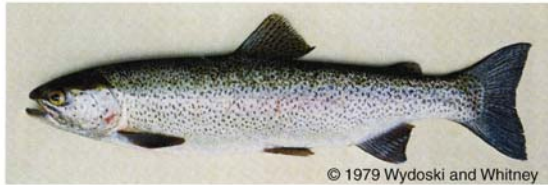


breeding male:

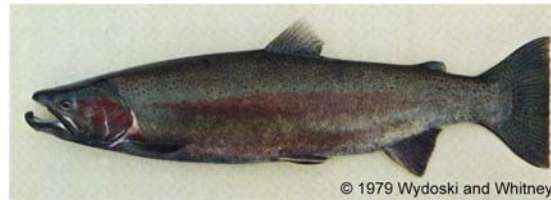
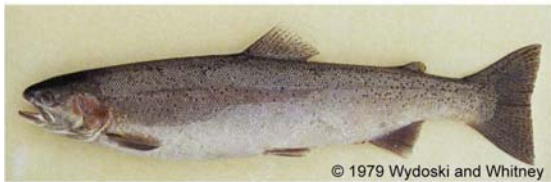


red shiner (*Cyprinella lutrensis*) carpita roja <= 8 cm SL

Mountain Reservoirs 1 of 7



rainbow trout (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FL



steelhead (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FL

Lakes of Santa Clara River and Los Angeles River (especially Echo Park Lake):



Sacramento blackfish (*Orthodon microlepidotus*) ≤ 50 cm FL

Pyramid Lake:



Sacramento pikeminnow (*Ptychocheilus grandis*) ≤ 115 cm

Sacramento blackfish photo from McGinnis 1984, Sacramento pikeminnow photo from <http://206.110.20.140/users/thiele/web/creek/field/verts/squaw.html>.

Mountain Reservoirs 2 of 7

Lakes of Ventura River,
Santa Clara River,
Los Angeles River,
and San Gabriel River:



largemouth bass (*Micropterus salmoides*) lobina negra ≤ 76 cm TL

Morris Dam,
Pyramid Lake



smallmouth bass (*Micropterus dolomieu*) ≤ 69 cm TL

Lakes of Santa Clara River:



striped bass (*Morone saxatilis*) lobina estriada ≤ 125 cm FL

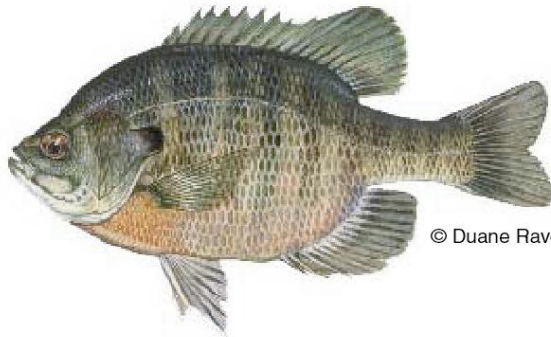
All reservoirs:



green sunfish (*Lepomis cyanellus*) pez sol ≤ 30 cm SL

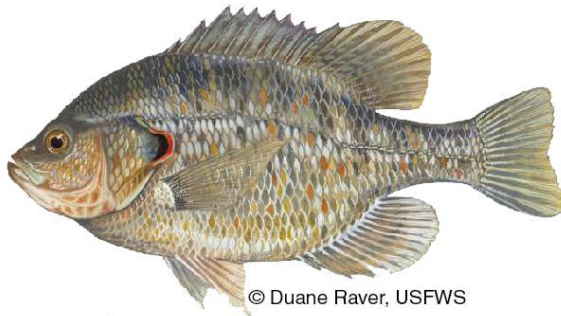
Largemouth and smallmouth bass illustrations from <http://training.fws.gov/bart/ravercd.html>.

Mountain Reservoirs 3 of 7



bluegill (*Lepomis macrochirus*)
mojarra oreja azul ≤ 41 cm TL

© Duane Raver, USFWS



redear sunfish (*Lepomis microlophus*)
mojarra oreja roja ≤ 25 cm TL

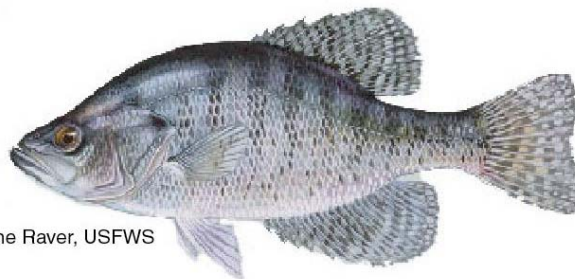
© Duane Raver, USFWS

black crappie (*Pomoxis nigromaculatus*)
.... mojarra negra ≤ 49 cm TL



© 1979 Wydoski and Whitney

white crappie (*Pomoxis annularis*)
.... ≤ 53 cm TL



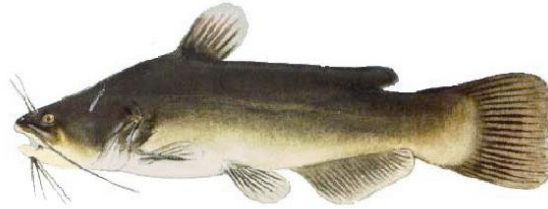
© Duane Raver, USFWS

bluegill, redear, and white crappie illustrations from: <http://training.fws.gov/bart/ravercd.html>.

Mountain Reservoirs 4 of 7



© Duane Raver, USFWS



black bullhead (*Ameiurus melas*) bagre torito negro ≤ 61 cm TL

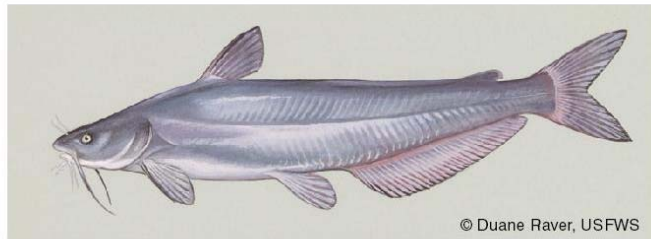


© Duane Raver, USFWS



(24-29 anal fin rays)

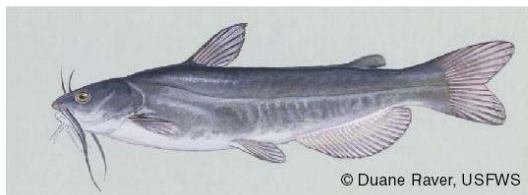
channel catfish (*Ictalurus punctatus*) bagre de canal ≤ 100 cm TL



© Duane Raver, USFWS

blue catfish (*Ictalurus furcatus*) bagre azul ≤ 160 cm TL

Pyramid and Castaic Lakes:

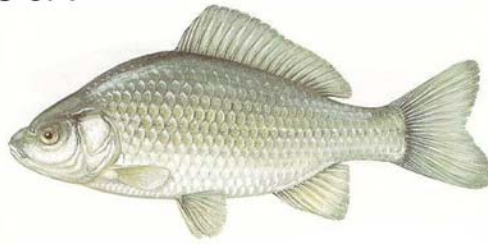


© Duane Raver, USFWS

white catfish (*Ameiurus catus*) (22-25 anal fin rays) ≤ 60 cm TL

Black bullhead illustration from <http://www.tpwd.state.tx.us/fish/infish/species/bbh/bigfish.htm>, younger channel catfish and white catfish illustration from <http://training.fws.gov/bart/ravercd.html>, older channel catfish illustration from <http://www.dec.state.ny.us/website/dfwmr/fish/fishspecs/channelcatfish.gif>,

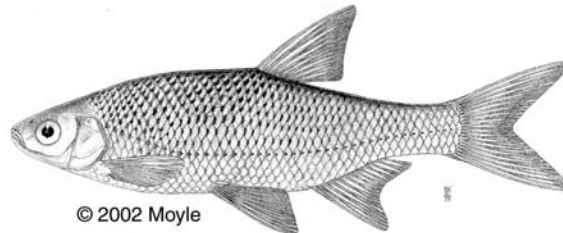
Mountain Reservoirs 5 of 7



goldfish (*Carassius auratus*) carpa dorada ≤ 30 cm SL

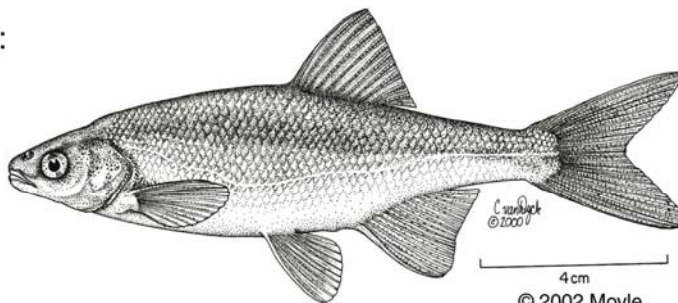


common carp (*Cyprinus carpio*) carpa común ≤ 80 cm SL



golden shiner (*Notemigonus crysoleucas*) (dorsal fin rays=7-9, usually 8) ≤ 26 cm SL

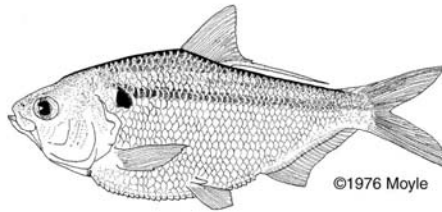
Pyramid Lake:



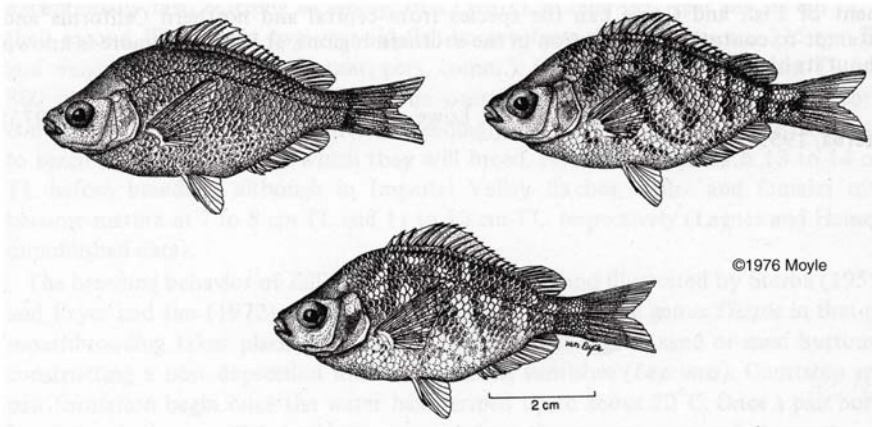
hitch (*Lavinia exilicauda*) (dorsal fin rays =10-13).... ≤ 35 cm FL

Goldfish illustration from <http://www.fsz.bme.hu/~pink/webpeca/halak/ezust.jpg>, golden shiner photo from http://www.fcps.k12.va.us/StratfordLandingES/Ecology/mpages/golden_shiner.htm.

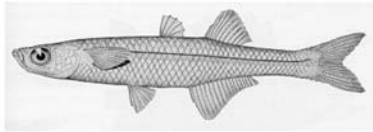
Mountain Reservoirs 6 of 7



threadfin shad (*Dorosoma petenense*) *sardina maya* ≤ 22 cm TL
Pyramid Lake:



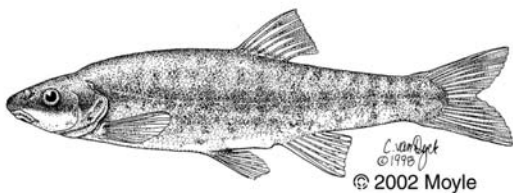
tule perch (*Hysterothys traskii*) ≤ 23.8 cm SL



© Fishes of the Chesapeake Bay. E. O. Murdy, R. S. Birdsong, J. A. Musick

Mississippi silverside (*Menidia audens*) ≤ 12 cm SL

Lakes of Santa Clara River, Los Angeles River, and San Gabriel River only:



speckled dace (*Rhinichthys osculus*) *carpita pinta* ≤ 11 cm SL

Mississippi (=Inland, in part) silverside illustration from <http://www.fisheries.vims.edu/trawlseine/seinegraphs/inlsilverside.htm>, photo from <http://users.ev1.net/~spituch/Steve's%20Page/Aquarium/Texas%20Fish/silverside1.jpg>.

Mountain Reservoirs 7 of 7

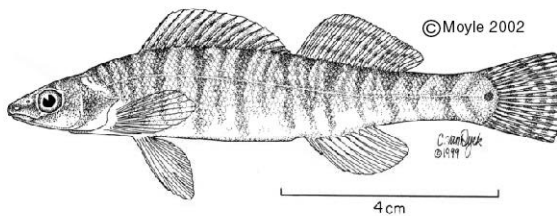
Casitas and Castaic Lakes:



© 1979 Wydoski and Whitney

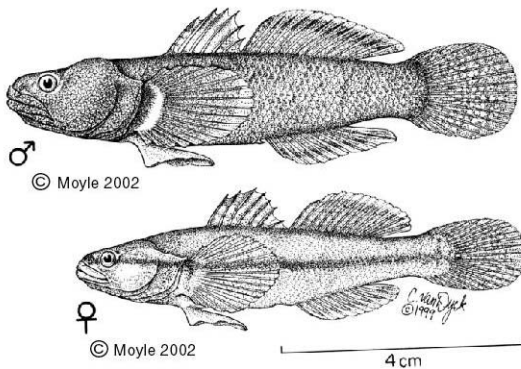
prickly sculpin (*Cottus asper*) <= 20 cm SL

Castaic and Pyramid Lakes:



bigscale logperch (*Percina macrolepida*) perca escamona <= 12.5 cm TL

Pyramid Lake:



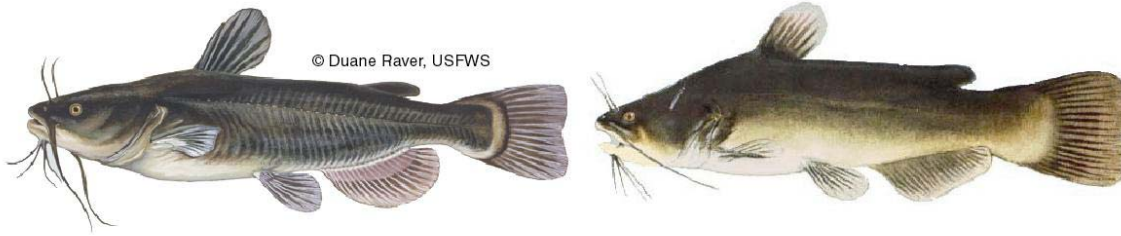
shimofuri goby (*Tridentiger bifasciatus*) <= 10.5 cm TL

illustration of inland silverside from

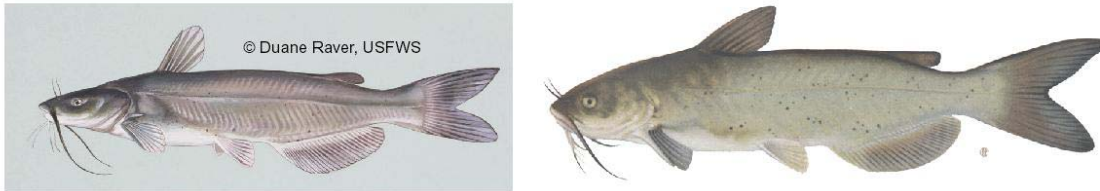
<http://www.fisheries.vims.edu/trawlseine/seinegraphs/inlsilverside.htm>, photo from <http://users.ev1.net/~spituch/Steve's%20Page/Aquarium/Texas%20Fish/silverside1.jpg>.

Male shimofuri goby picture from: <http://host.agri.pref.ibaraki.jp/~naisuishi/photo/simofuri.htm>, and female shimofuri goby picture from <http://homepage2.nifty.com/PhD-mukai/Laboratory/Tridentiger/Tridentiger2.html>.

Mountain Streams 1 of 5

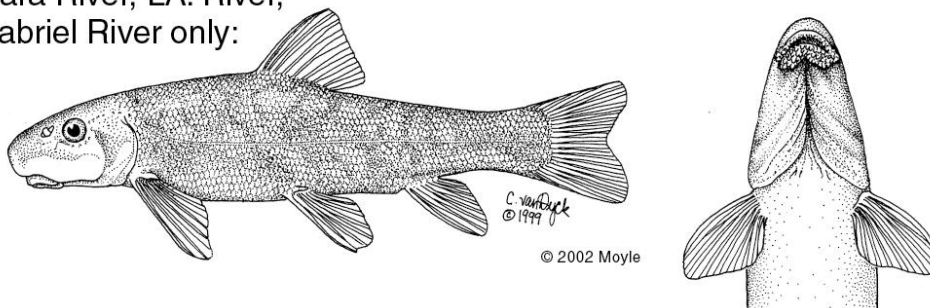


black bullhead (*Ameiurus melas*) bagre torito negro <= 61 cm TL



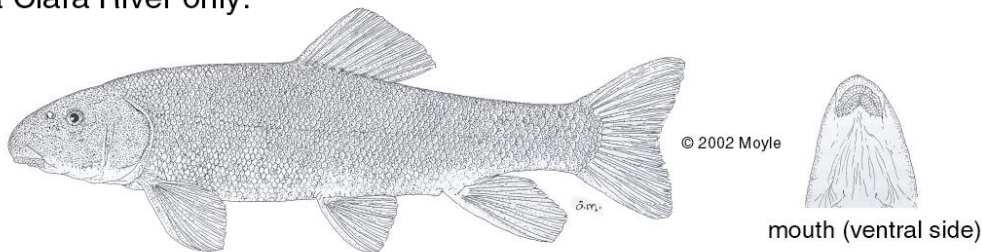
channel catfish (*Ictalurus punctatus*) bagre de canal <= 100 cm TL

Santa Clara River, LA. River,
& San Gabriel River only:



Santa Ana sucker (*Catostomus santaanae*) <= 16 cm SL

Santa Clara River only:



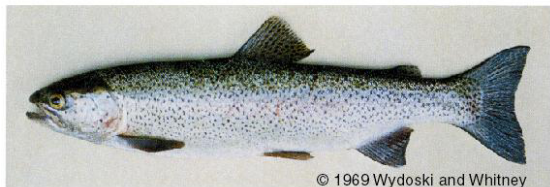
Owens sucker (*Catostomus fumeiventris*) <= 50 cm SL

First black bullhead, and channel catfish from <http://training.fws.gov/bart/ravercd.html>,

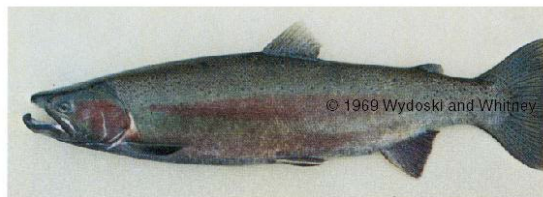
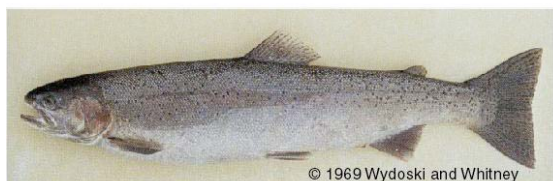
second black bullhead illustration from <http://www.tpwd.state.tx.us/fish/infish/species/bbh/bigfish.htm>,

second channel catfish from: <http://www.dec.state.ny.us/website/dfwmr/fish/fishspecs/channelcatfish.gif>.

Mountain streams 2 of 5



rainbow trout (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI



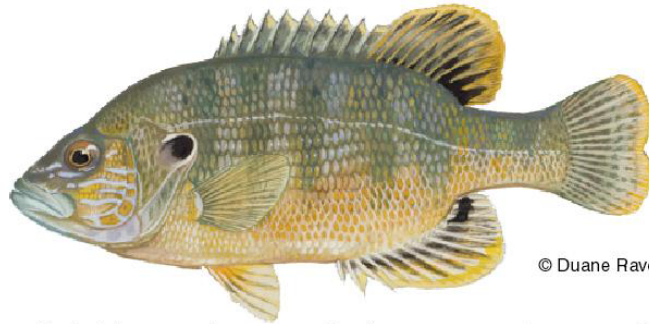
steelhead (*Oncorhynchus mykiss*) trucha arcoiris ≤ 114 cm FI

Santa Clara River,
Los Angeles River,
and San Gabriel River
only:



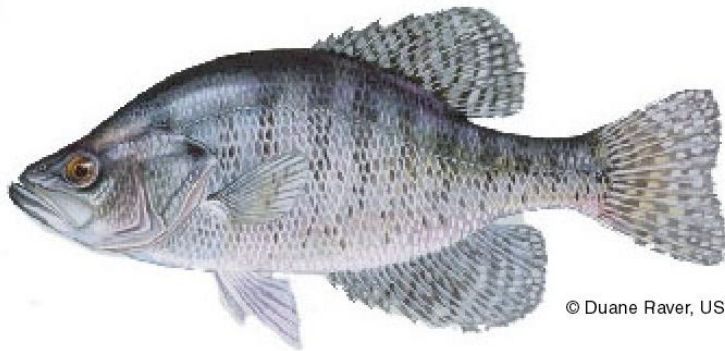
brown trout (*Salmo trutta*) trucha marrón ≤ 103 cm TL

Mountain Streams 3 of 5



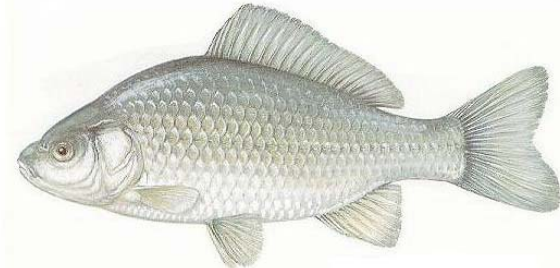
© Duane Raver, USFWS

green sunfish (*Lepomis cyanellus*) pez sol ≤ 30 cm SL



© Duane Raver, USFWS

white crappie (*Pomoxis annularis*) ≤ 53 cm TL



goldfish (*Carassius auratus*) carpa dorada ≤ 30 cm SL

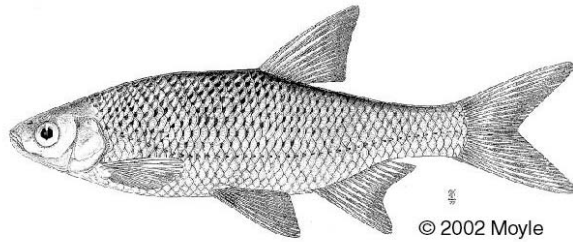


© Duane Raver, USFWS

common carp (*Cyprinus carpio*) carpa común ≤ 80 cm SL

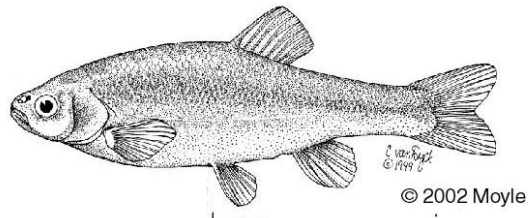
Sunfish, white crappie, and common carp illustration from <http://training.fws.gov/bart/ravercd.html>,
goldfish illustration from <http://www.fsz.bme.hu/~pink/webpeca/halak/ezust.jpg>.

Mountain Streams 4 of 5



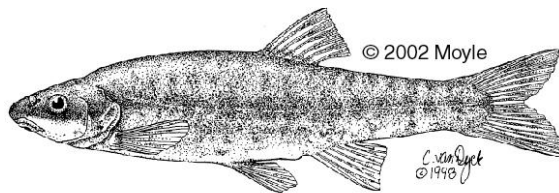
golden shiner (*Notemigonus crysoleucas*) ≤ 26 cm SL

All rivers except Calleguas Creek:



Arroyo chub (*Gila orcutti*) carpita del arroyo? ≤ 9 cm SL

Santa Clara River, Los Angeles River, and San Gabriel River only:



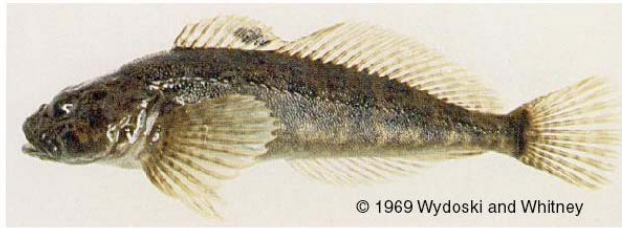
speckled dace (*Rhinichthys osculus*) carpita pinta ≤ 11 cm SL

Golden shiner photo from

http://www.fcps.k12.va.us/StratfordLandingES/Ecology/mpages/golden_shiner.htm, arroyo chub photo from http://www.dfg.ca.gov/hcpb/cgi-bin/read_one.asp?specy=fish&idNum=23

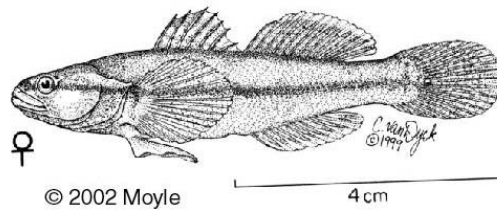
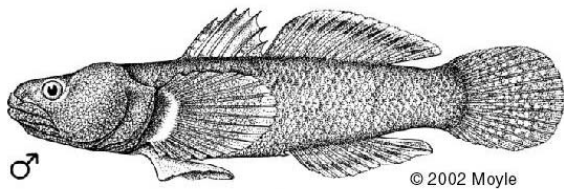
Mountain Streams 5 of 5

Ventura River
and Santa Clara River
only:



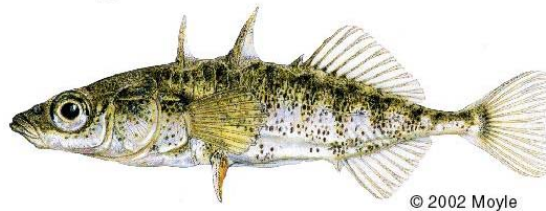
prickly sculpin (*Cottus asper*) <= 20 cm SL

Found in Santa Clara River only:



shimofuri goby (*Tridentiger bifasciatus*) <= 10.5 cm TL

Everywhere except Calleguas Creek:



threespine stickleback (*Gasterosteus aculeatus*) espinocho 8 cm TL

Shimofuri goby illustration from Moyle 2002, photos from <http://host.agri.pref.ibaraki.jp/~naisuishi/photo/simofuri.htm> and <http://homepage2.nifty.com/PhD-mukai/Laboratory/Tridentiger/Tridentiger2.html>.