

Annual Status of the Fisheries Report

Introduction

The Marine Life Management Act (MLMA) of 1998 recognized that one of the keys to effective fisheries management is periodic review. The MLMA mandated that the California Department of Fish and Game (DFG) review at least one quarter of state-managed marine fisheries annually, review each restricted access program at least every five years, and provide an annual report to the Fish and Game Commission. The *Annual Status of the Fisheries Report* (ASFR) is required to:

- Identify any fishery that does not meet the sustainability policies of the MLMA
- Evaluate whether the management system in place is fair and reasonable in its interactions with the people affected by management of the fishery
- Provide information on landings and fishing effort
- Identify areas where each fishery occurs
- Identify causes for any depressed fishery, and steps being taken to rebuild the fishery
- Recommend, to the extent practicable, additional steps that may be taken to rebuild the fishery
- Determine the consistency of restricted access fishery programs with the Fish and Game Commission's policies on restricted access fisheries (Fish and Game Code §7065 and §7066)

The focus of the ASFR is on state-managed marine species that are the subject of a directed recreational or commercial fishery. To determine the species of marine life to include in the annual ASFRs, the ASFR editors reviewed the list of state-managed marine life in the MLMA Master Plan (Appendix A). This list, which includes 375 categories of marine fish, invertebrates, plants and algae, was used as a basis for developing the list of species to be reviewed in ASFRs. ASFR editors modified the MLMA Master Plan list such that:

- Species that reside primarily outside state waters or in freshwater habitats were eliminated
- Species included in a Pacific Fishery Management Council (PFMC) fishery management plan were eliminated. However, species that are the subject of both a PFMC fishery management plan and a state fishery management plan were included
- Species with a prohibition on recreational and commercial harvest were eliminated
- Species not the subject of a directed marine fishery at present or in the foreseeable future were eliminated. However, species taken incidentally as bycatch, or that were previously the subject of a directed fishery, were included in the list of species to monitor

The ASFR list of species was divided into four groups. Every year, one group will be reviewed in a ASFR (Table 1), so that each group will be reviewed every four years. The ASFR list was further subdivided into species that will receive a detailed review (full review) and species that will be monitored and receive a limited review (Table 1). Each restricted access program will be reviewed in conjunction with the fishery to which it applies.

The ASFR list of species is a dynamic document that currently contains over 150 species (Table 1). As fisheries change, this list will be modified. For example, fishery landings will be monitored for new and emerging fisheries, and new species may be added to the list. Conversely, species no longer supporting a directed fishery, or species that become the subject of a PFMC fishery management plan, will be removed.

The MLMA mandate for periodic reports on the status of California's living marine resources was not created until 1998; however, the DFG has undertaken such reports previous to that time. The DFG has published four reports that address the status of California's living marine resources, often in conjunction with the University of California Sea Grant Extension Program:

- *California Ocean Fisheries Resources to the Year 1960* (published in 1961)
- *California's Living Marine Resources and Their Utilization* (published in 1971)
- *California's Living Marine Resources and Their Utilization* (published in 1992)
- *California's Living Marine Resources: A Status Report* (published in 2001)

In 2001, DFG collaborated with the University of California Sea Grant Extension Program to produce *California's Living Marine Resources: A Status Report*. This report presented the best information available for state-managed marine fisheries, federally-managed fisheries, anadromous fisheries, and marine wildlife. It also presented information about oceanic, environmental, regulatory, and socioeconomic factors that affect California's living marine resources. This ASFR builds upon and updates the information presented in the 2001 report.

This ASFR includes 14 reviews covering 42 species and 3 restricted access programs. Each review addresses the specific items required per Fish and Game Code §7065 and §7066 and provides:

- An overview of human use and harvest, including information on landings, fishing effort, and location of the fishery
- An overview of the biological characteristics of the species
- Our current understanding of the status of the population(s), identifying fisheries that are depressed or not sustainable
- A description of current management activities, factors that might affect management, and management activities that could be considered to sustain healthy populations, enhance populations or improve the fishery.

Three primary types of fishery-dependent data (that is, data collected directly from fishery activities) (Appendix B) were used in this ASFR:

- Commercial landing receipts for commercial fisheries

- Marine Recreational Fisheries Statistics Survey (MRFSS) estimates of recreational catch
- Commercial passenger fishing vessel (CPFV) logbook landings of recreational catch from CPFVs

Some reviews used other fishery-dependent and fishery-independent data sources; these sources are described in the individual reviews.

Table 1. List of fisheries reviewed in the <i>Annual Status of the Fisheries Reports</i>					
Review title	Species in the review		Type of review ¹	Includes a review of a restricted access program ²	Report cycle ³
	Common name	Scientific name			
ALGAE					
Giant Kelp	giant kelp	<i>Macrocystis pyrifera</i>	Full		1
Bull Kelp	bull kelp	<i>Nerocystis luetkeana</i>	Full		1
Sea Palm	sea palm	<i>Postelsia palmaeformis</i>	Full		1
INVERTEBRATES					
Abalones	black	<i>Haliotis cracherodii</i>	Full		1
	flat	<i>Haliotis walallensis</i>	Full		
	green	<i>Haliotis fulgens</i>	Full		
	pink	<i>Haliotis corrugata</i>	Full		
	pinto	<i>Haliotis kamtschatkana</i>	Full		
	red	<i>Haliotis rufescens</i>	Full		
	white	<i>Haliotis sorenseni</i>	Full		
Intertidal Invertebrates	giant limpet	<i>Lottia gigantea</i>	Full		2
	multiple species of top shell	<i>Tegula funebris</i> , <i>T. eiseni</i> , <i>T. gallina</i> , <i>T. aureotincta</i>	Full		
Subtidal Snails	wavy turban snail	<i>Megastrea undosa</i>	Full		2
	Kellet's whelk	<i>Kelletia kelletii</i>	Full		
Moon Snail	multiple species of moon snails	<i>Polinices</i> spp.	Limited		4
Hermisenda Nudibranch	hermisenda nudibranch	<i>Hermisenda crassicornis</i>	Limited		4
Littleneck Clams	banded chione	<i>Chione californiensis</i>	Full		3
	smooth chione	<i>Chione fluctifraga</i>	Full		
	wavy chione	<i>Chione undatella</i>	Full		
	common littleneck clam	<i>Protothaca staminea</i>	Full		
	Japanese (Manila) littleneck clam	<i>Tapes japonica</i> , <i>T. philippinarum</i>	Full		
	rough-sided littleneck clam	<i>Protothaca laciniata</i>	Full		
	thin-shelled littleneck clam	<i>Protothaca tenerrima</i>	Full		

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	Common name	Scientific name			
Washington Clams	Washington clam	<i>Saxidomus nuttalli</i>	Full		3
	butter clam	<i>Saxidomus giganteus</i>	Limited		
Gaper Clams	Pacific gaper clam	<i>Tresus nuttalli</i>	Full		3
	fat gaper clam	<i>Tresus capax</i>	Full		
California Jackknife Clam	California jackknife clam	<i>Tagelus californianus</i>	Limited		4
Northern Quahog Clam	northern quahog clam	<i>Mercenaria mercenaria</i>	Limited		4
Goeduck Clam	goeduck clam	<i>Panopea generosa</i>	Full		3
Pismo Clam	Pismo clam	<i>Tivela stultorum</i>	Full		4
Northern Razor Clam	northern razor clam	<i>Siliqua patula</i>	Limited		4
Softshell Clam	softshell clam	<i>Mya arenaria</i>	Limited		4
Rock Scallop	rock scallop	<i>Crassadoma gigantea</i>	Limited		4
Mussels	multiple species of mussels	<i>Mytilus galloprovincialis</i> , <i>M. trossulus</i> , <i>M. californianus</i>	Limited		4
Market Squid	market squid	<i>Loligo opalescens</i>	Full	X	4
Two-spot Octopus	two-spot octopus	<i>Octopus bimaculoides</i> , <i>O. bimaculatus</i>	Limited		4
Bay Shrimp	California bay shrimp	<i>Crangon franciscorum</i>	Full		2
	blacktail bay shrimp	<i>Crangon nigricauda</i>	Full		
	blackspotted bay shrimp	<i>Crangon nigromaculata</i>	Full		
	oriental shrimp	<i>Palaemon macrodactylus</i>	Full		
Prawns	golden prawn	<i>Penaeus californiensis</i>	Full	X	4
	ridgeback prawn	<i>Sicyonia ingentis</i>	Full		
	spot prawn	<i>Pandalus platyceros</i>	Full		
Coonstriped Shrimp	coonstriped shrimp	<i>Pandalus danae</i>	Full		4
Pink Shrimp	ocean shrimp	<i>Pandalus jordani</i>	Full	X	4
Red Rock Shrimp	red rock shrimp	<i>Lysmata californica</i>	Full		4
Blue Mud Shrimp	blue mud shrimp	<i>Upogebia pugettensis</i>	Limited		4
Ghost Shrimp	multiple species of ghost shrimp	<i>Callinassa californiensis</i> , <i>Callinassa affinis</i> , <i>C. gigas</i>	Limited		4
California Spiny Lobster	California spiny lobster	<i>Panulirus interruptus</i>	Full	X	1
Sand Crab	sand crab	<i>Emerita analoga</i>	Limited		4
Rock Crabs	brown rock crab	<i>Cancer antennarius</i>	Full		1
	red rock crab	<i>Cancer productus</i>	Full		
	yellow rock crab	<i>Cancer anthonyi</i>	Full		

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	Common name	Scientific name			
Dungeness Crab	Dungeness crab	<i>Cancer magister</i>	Full	X	1
Slender Crab	slender crab	<i>Cancer gracilis</i>	Limited		4
Tanner Crab	tanner crab	<i>Chionoecetes tanneri</i>	Limited		4
Sheep Crab	sheep crab	<i>Loxorhynchus grandis</i>	Full		1
Box Crab	box crab	<i>Lopholithodes foraminatus</i>	Limited		4
Sea Urchins	red sea urchin	<i>Strongylocentrotus franciscanus</i>	Full	X	1
	purple sea urchin	<i>Strongylocentrotus purpuratus</i>	Full		
Sea Cucumbers	California sea cucumber	<i>Parastichopus californicus</i>	Full	X	2
	warty sea cucumber	<i>Parastichopus parvimensis</i>	Full		
FISHES					
Hagfish	black hagfish	<i>Eptatretus deani</i>	Limited		4
	Pacific hagfish	<i>Eptatretus stouti</i>	Limited		
Cow Sharks	sevengill shark	<i>Notorynchus cepedianus</i>	Full		2
	sixgill shark	<i>Hexanchus griseus</i>	Full		
Nearshore Sharks and Rays	brown smoothhound	<i>Mustelus henlei</i>	Full		2
	gray smoothhound	<i>Mustelus californicus</i>	Full		
	angel shark	<i>Squatina californica</i>	Full		
	shovelnose guitarfish	<i>Rhinobatos productus</i>	Full		
	thornback	<i>Platyrrhinoidis triseriata</i>	Full		
	bat ray	<i>Myliobatis californica</i>	Full		
Pacific Electric Ray	Pacific electric ray	<i>Torpedo californica</i>	Limited		4
Pacific Herring	Pacific herring	<i>Clupea pallasii</i>	Full	X	3
True Smelt	night smelt	<i>Spirinchus starksi</i>	Full		4
	surf smelt	<i>Hypomesus pretiosus</i>	Full		
	whitebait smelt	<i>Allosmerus elongatus</i>	Full		
California Lizardfish	California lizardfish	<i>Synodus lucioceps</i>	Limited		4
Pacific tomcod	Pacific tomcod	<i>Microgadus proximus</i>	Limited		4
Siversides	California grunion	<i>Leuresthes tenuis</i>	Full		4
	jacksmelt	<i>Atherinopsis californiensis</i>	Full		
	topsmelt	<i>Atherinops affinis</i>	Full		

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Nearshore Rockfishes and Scorpionfishes	black rockfish	<i>Sebastes melanops</i>	Full	X (Nearshore and Deeper Nearshore)	3
	black-and-yellow rockfish	<i>Sebastes chrysomelas</i>	Full		
	blue rockfish	<i>Sebastes mystinus</i>	Full		
	brown rockfish	<i>Sebastes auriculatus</i>	Full		
	calico rockfish	<i>Sebastes dalli</i>	Full		
	China rockfish	<i>Sebastes nebulosus</i>	Full		
	copper rockfish	<i>Sebastes caurinus</i>	Full		
	gopher rockfish	<i>Sebastes carnatus</i>	Full		
	grass rockfish	<i>Sebastes rastrelliger</i>	Full		
	kelp rockfish	<i>Sebastes atrovirens</i>	Full		
	olive rockfish	<i>Sebastes serranoides</i>	Full		
	quillback rockfish	<i>Sebastes maliger</i>	Full		
	treefish	<i>Sebastes serriceps</i>	Full		
	California scorpionfish	<i>Scorpaena guttata</i>	Full		
Greenlings	kelp greenling	<i>Hexagrammos decagrammus</i>	Full	X (Nearshore)	3
	rock greenling	<i>Hexagrammos lagocephalus</i>	Full		
Cabazon	cabazon	<i>Scorpaenichthys marmoratus</i>	Full	X (Nearshore)	3
Pacific Staghorn Sculpin	Pacific staghorn sculpin	<i>Leptocottus armatus</i>	Full		2
Sea Basses	barred sand bass	<i>Paralabrax nebulifer</i>	Full		1
	kelp bass	<i>Paralabrax clathratus</i>	Full		
	spotted sand bass	<i>Paralabrax maculatofasciatus</i>	Full		
Ocean Whitefish	ocean whitefish	<i>Caulolatilus princeps</i>	Full		1
Yellowtail	yellowtail	<i>Seriola lalandi</i>	Full		4
Sargo	sargo	<i>Anisotremus davidsoni</i>	Full		2
California sheephead	California sheephead	<i>Semicossyphus pulcher</i>	Full	X (Nearshore)	3
Drums	California corbina	<i>Menticirrhus undulatus</i>	Full		3
	spotfin croaker	<i>Roncador stearnsi</i>	Full		
	white croaker	<i>Genyonemus lineatus</i>	Full		
	yellowfin croaker	<i>Umbrina roncadore</i>	Full		
	queenfish	<i>Seriphus politus</i>	Full		
White Seabass	white seabass	<i>Atractoscion nobilis</i>	Full		3
Sea Chubs	halfmoon	<i>Medialuna californiensis</i>	Full		4
	opaleye	<i>Girella nigricans</i>	Full		

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	Common name	Scientific name			
Surfperches	barred surfperch	<i>Amphistichus argenteus</i>	Full		1
	black perch	<i>Embiotoca jacksoni</i>	Full		
	calico surfperch	<i>Amphistichus koelzi</i>	Full		
	dwarf perch	<i>Micrometrus minimus</i>	Full		
	kelp perch	<i>Brachyistius frenatus</i>	Full		
	pile perch	<i>Rhacochilus vacca</i>	Full		
	pink seaperch	<i>Zalembeius rosaceus</i>	Full		
	rainbow seaperch	<i>Hypsurus caryi</i>	Full		
	redtail surfperch	<i>Amphistichus rhodoterus</i>	Full		
	reef perch	<i>Micrometrus aurora</i>	Full		
	rubberlip seaperch	<i>Rhacochilus toxotes</i>	Full		
	sharpnose seaperch	<i>Phanerodon atripes</i>	Full		
	shiner perch	<i>Cymatogaster aggregata</i>	Full		
	silver surfperch	<i>Hyperprosopon ellipticum</i>	Full		
	spotfin surfperch	<i>Hyperprosopon anale</i>	Full		
	striped seaperch	<i>Embiotoca lateralis</i>	Full		
	walleye surfperch	<i>Hyperprosopon argenteum</i>	Full		
	white seaperch	<i>Phanerodon furcatus</i>	Full		
Blacksmith	blacksmith	<i>Chromis punctipinnis</i>	Limited		4
Striped Mullet	striped mullet	<i>Mugil cephalus</i>	Limited		4
Pacific Barracuda	pacific barracuda	<i>Sphyaena argentea</i>	Full		4
Monkeyface Prickleback	monkeyface prickleback	<i>Cebidichthys violaceus</i>	Full		3
Wolf eel	wolf eel	<i>Anarrhichthys ocellatus</i>	Limited		4
Pacific bonito	Pacific bonito	<i>Sarda chiliensis</i>	Full		2
Pacific Pompano	Pacific pompano	<i>Peprilus simillimus</i>	Full		2
Sanddabs	longfin sanddab	<i>Citharichthys xanthostigma</i>	Full		2
	speckled sanddab	<i>Citharichthys stigmaeus</i>	Full		
California Halibut	California halibut	<i>Paralichthys californicus</i>	Full		1
Diamond Turbot	diamond turbot	<i>Hypsopsetta guttulata</i>	Limited		4
Fantail Sole	fantail sole	<i>Xystreurys liolepis</i>	Limited		4
OTHER REVIEWS					
Scientific Collection	multiple species		Full		2
Aquarium Trade	multiple species		Full		3
Emerging Fisheries	multiple species		Limited		4

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Review title	Species in the review		Type of review¹	Includes a review of a restricted access program²	Report cycle³
	Common name	Scientific name			
General Gill and Trammel Net Restricted Access	Not applicable	Not applicable	Restricted Access Review only	X	2
Drift Gillnet (shark and swordfish) Restricted Access	Not applicable	Not applicable	Restricted Access Review only	X	4
Finfish Trap Restricted Access	Not applicable	Not applicable	Restricted Access Review only	X	3
Salmon Vessel Restricted Access	Not applicable	Not applicable	Restricted Access Review only	X	4
1. Each species will receive either a detailed review (full review) or a limited review. Species that are not the subject of a directed fishery, but are taken as bycatch or were previously the subject of a directed fishery will be monitored and receive a limited review. 2. Restricted access programs that are directly connected with a particular species or group of species on the <i>Annual Status of the Fisheries Reports</i> list of species will be reviewed in conjunction with that species or group of species. Other restricted access programs will be reviewed separately. 3. The list of reviews is divided into four groups (#1, 2, 3, and 4). Every year, one group will be reviewed.					