# Nearshore Ecosystem Fish Resources: Overview



About 450 species of finfish occupy California's nearshore ecosystem within the limits of the continental shelf. The 60 plus species addressed in this chapter exhibit a wide range of distribution, habitat preferences, movement patterns, reproductive characteristics, age, and growth. Their contributions to the fisheries of California are varied as well. As a group these fish inhabit all available nearshore habitats (*e.g.,* kelp forests, rocky intertidal, sandy bottom, open water) in the nearshore ecosystem at some stage in their life-cycle.

The kinds and distributions of fish occupying the nearshore ecosystem off California are influenced by several environmental factors, water temperature being perhaps the most important. California's lengthy coastline spans nearly 10 degrees of latitude resulting in waters varying from cool-temperate in the north to warm-temperate in the south. Warmer waters off southern California and Baja California, Mexico, support several game fish and other locally important fish that are found infrequently if at all, north of Point Arguello, the northern reach of the Southern California Bight. By contrast, species common north of Point Arguello may find preferred water temperatures to the south by moving deeper in the water column. In addition, seasonal, annual, and decadal changes in water temperature (*e.g.,* El Niño) result in northerly movements of fish that might otherwise be found mostly off Baja California, or southern California. Besides water temperature, habitat preferences and general ecological requirements control distributions.

Nineteen species, mostly rockfish, have been included in the Nearshore Fisheries Management Plan required by the Marine Life Management Act of 1998. These species occur coast-wide, but some are rarely seen in southern California (*e.g.,* quillback, China and black rockfishes, kelp greenling and monkeyface prickleback), while others are rare north of Point Conception (*e.g.,* California sheephead, California scorpionfish, calico rockfish and treefish). Collectively, these species are relatively long-lived, slow-growing fish that take several years to reach maturity and spawn. Most of the species were seldom harvested commercially until the development of the live-fish fishery during the early 1990s. No estimates of abundance exist on a coast-wide basis for any of the species. Managers, fishermen, and scientists are all concerned about the sustainability of the fishery. These concerns have resulted in the imposition of several recent management measures to balance harvests with available resources, reduce sport-commercial conflicts, and stabilize the nearshore fishery pending completion of a more comprehensive Nearshore Fishery Management Plan. The status of most nearshore fishes is still uncertain, and it is expected to take time to determine the effects of current management of individual stocks.

Non-rockfish species have differing affinities (generally defined by their adult behavior) to the nearshore ecosystem habitats. They include the open-water, coastal-migratory species (*e.g.,* yellowtail, California barracuda, white seabass, and Pacific bonito); the nearshore sandy-bottom dwellers (*e.g.*, California halibut, sanddabs, starry flounder, Pacific angel shark, skates and rays); kelp and/or rocky reef inhabitants (*e.g.*, kelp bass, giant sea bass, lingcod, opaleye and halfmoon); and those that spend most of their lives in or near the surf-zone (*e.g.*, California corbina, surfperches, grunion, and the croakers). Most of these species are commercially harvested, but a few have been designated for sport fish use only (*e.g.*, kelp bass, barred sand bass, spotted sand bass, California corbina, and spot and yellowfin croakers). Giant sea bass has been managed under a moratorium on both commercial and recreation take since 1982. While very little has been done to assess the population size of most of these species, catch and landing trends can often be used to gauge the health of the resource. For example, California halibut catches have been remarkably stable over the last two decades, and, while both lingcod and Pacific bonito catches show precipitous declines in landings, California barracuda sport fish catches have increased to the levels of the 1950s. However, the status of most is uncertain. This uncertainty stems from a lack of historic and current fisheries data useful in stock assessments, absence of life history and recruitment data, as well as insufficient understanding of habitat relationships and requirements, and the probable effects of habitat alterations (including pollution) on stocks.

Commercial fisheries for these species utilize a variety of gear, which has been made more efficient over the past century through the introduction of modern net, line, and

Surf
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trap materials, modified fishing techniques and strategies, improved deck machinery and hydraulics, and advances in fish finding electronics. Some gear determined to be too effective or not sufficiently selective has been prohibited. Historically and currently used commercial gear includes five general types as follows: 1) traps; 2) hook-and-line; 3) gill and trammel nets; 4) trawl nets; and 5) round haul nets.

*Traps*: The finfish trap is a relative newcomer to nearshore commercial fisheries. During the late 1980s, finfish traps were introduced into nearshore waters off southern California for taking several shallow-water species (including California sheephead, cabezon, kelp and rock greenling, California scorpionfish, several species of rockfish, and moray eel). The finfish trap fishery has since expanded in number of participants and number of species harvested, and has progressed northward to nearshore waters off central and northern California. Traps accounted for about seven percent of the statewide live/premium fish landings during 1999. The finfish trap fishery off southern California has operated under a finfish trap permit as a limited entry fishery since 1996. North of Point Arguello a finfish trap permit is not required, but a recent moratorium on issuing general trap permits restricts entry pending evaluation of comprehensive limited access measures.

*Hook-and-Line*: A variety of commercial hook-and-line gear (vertical and horizontal setlines, troll lines, rod and reel, and "stick gear") is employed to take a variety of finfish in the nearshore ecosystem. Of most immediate interest (and concern) is the live fish hook-and-line fishery that employs primarily rod-and-reel and "stick" or "pipe" gear. In general, this gear is used to harvest the same species of live/premium fish as finfish traps and is conducted under the same nearshore fishery permit. Seventy percent of the statewide live/premium fish landings were caught on hook-and-line gear. The number of nearshore hook-and-line fishery participants increased during the past decade, with about 1,130 permits issued during 1999. This number is expected to remain stable with recent adoption of the moratorium on new permits. Commercial vessels using fishing lines within one mile of the mainland shore are limited to a maximum of 150 hooks per vessel and 15 hooks per line. These restrictions were enacted in 1995 to address initial concerns for the rapidly expanding commercial hook-and-line fishery that included some vessels employing thousands of hooks. Other hook-and-line gear include troll lines used to harvest California halibut in the San Francisco Bay area and rod-and-reel used to take redtail surfperch in northern California.

*Gill and Trammel Nets*: The use of gill and trammel nets to harvest rockfish, California halibut, white seabass, California barracuda, soupfin shark, angel shark, white croaker, and other nearshore species, increased during the 1960s and peaked during the 1980s (1,122 General Gill and Trammel Net Permits issued during 1985). However, these nets have since been largely restricted to deeper waters from one to ten miles offshore, and prohibited in the inshore rockfish fishery. They are also prohibited north of Point Reyes, Marin County. Restrictions on the use of this gear were enacted to address problems with accidental entanglement and drowning of seabirds and marine mammals and to address sport-commercial fishery allocation conflicts. Gill and trammel net use in the nearshore ecosystem has declined since the mid-1980s (presently about 220 permits issued annually), but the gear is still used to varying degrees to take lingcod, white seabass, California barracuda, California halibut, and rockfish in waters seaward of areas closed to its use. California halibut and rockfish taken in gill and trammel nets have increasingly appeared in the live/premium fish fishery, while nets (trawl and gill and trammel nets) accounted for about 23 percent of 1999 landings of live/premium fish. Restrictions on the use of gill and trammel nets include minimum mesh sizes for several species, limits on the length of net that may be fished for various species, and several depth closures.

*Trawl nets*: Early commercial trawls such as paranzella and beam trawls have been largely replaced by otter trawls used to take bottom and midwater fishes including rockfish, lingcod, California halibut, and other flatfishes. Trawl nets are presently authorized for use to take finfish three or more nautical miles offshore, and to take California halibut in the halibut trawl grounds off southern California. Restrictions on trawl nets include minimum cod-end mesh sizes to enable the release of sub-adult fishes.

*Round Haul Nets*: Round haul gear (purse seine and lampara) used during the 1920s to harvest millions of pounds of white seabass, barracuda, and yellowtail is now prohibited for these species. Presently, smaller scale round haul gear in the form of lampara and drum seines (bait nets) is used to take white croaker, perch, and bait species that include smelt, white croaker, and queenfish, but this take is relatively small.

Early recreational fishing during the late–1800s off California targeted giant sea bass, tuna, white seabass, and yellowtail using handlines and early rod-and-reel fishing gear from private or chartered craft. During the 1920s and 1930s, early commercial passenger fishing vessels (CPFV) began to carry anglers to nearby popular fishing grounds, enabling catches of game fishes that were not as readily available to those fishing from fishing barges, piers, jetties, and beaches. Following World War II, the number of CPFV increased dramatically to serve a public eager to go fishing. In southern California, the CPFV fishery expanded during the 1960s into winter fishing for rockfish and lingcod to make year-round what had been a spring-

through-fall fishery. Also, improved rod-and-reel fishing equipment, the introduction of skin and SCUBA diving equipment, and accelerated private boat ownership beginning in the 1950s helped to increase the recreational take of fish during the latter half of the 1900s. By the 1950s, ocean sport fishing was becoming a recognized factor in the potential over-harvest of some species, and regulations affecting the take of popular nearshore fishes were promulgated along with commercial restrictions to maintain stocks of fishes in the nearshore ecosystem.

Other hook-and-line gear types include handlines that still are seen occasionally on piers, and the "poke pole" used in intertidal areas along the north coast to capture cabezon, greenling, and an occasional shallow water rockfish or prickleback. Most commercial forms of nets and traps are prohibited for sport use. However, baited hoop nets are permitted for taking certain species, and beach nets may be used to take surf smelt north of Point Conception. Spears, harpoons, and bow-and-arrow fishing tackle may be used to take all varieties of skates, rays, and sharks (except white shark) and grunion may be taken only by hand. Recreational divers operating from shore or from vessels use spearfishing equipment with or without aid of SCUBA gear. Anglers seeking game fish generally use live bait when available (anchovy, sardine, squid, and small croakers), but are often equally effective with the extensive arsenal of artificial lures available ranging from shrimp flies to one-pound or greater hexagon steel bars tipped with a single or treble hook (often used for lingcod). A variety of sand worms, sand crabs, mussels and squid are favored bait for shore fishing while squid is the standard for most rockfishes.

The outlook for sustaining healthy nearshore fish stocks and fisheries has generally improved in the eyes of managers with enactment of California's recent landmark legislation, the Marine Life Management Act of 1998. Fishery management plans for nearshore fish and white seabass should be close to adoption by the California Fish and Game Commission as this report nears publication date. The draft master plan, which is also a required by MLMA, calls for additional FMPs to be developed for California halibut, skates and rays, surfperches, kelp bass and barred sand bass.

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