

#### 4.12 COMMERCIAL FISHING AND KELP HARVEST

**Regional Setting:** Commercial fishing occurs at various locations off the coast of southern and central California. The nearshore waters along the coast from Los Angeles to Monterey counties and the waters just off the Channel Islands contain giant kelp beds that provide habitats for numerous species of commercially important fish and shellfish species. The majority of fish are caught within these areas. About 64 commercial fish and shellfish species are fished using up to 15 gear types. Fishery seasons are established and regulated by the California Department of Fish and Game (CDFG). Figure 4.12-1 shows the distribution of fish blocks in the Study Area, which are used to organize information on commercial fish catch. Fish blocks are 9- by 11-mile rectangles, or approximately 100 square miles of ocean area.

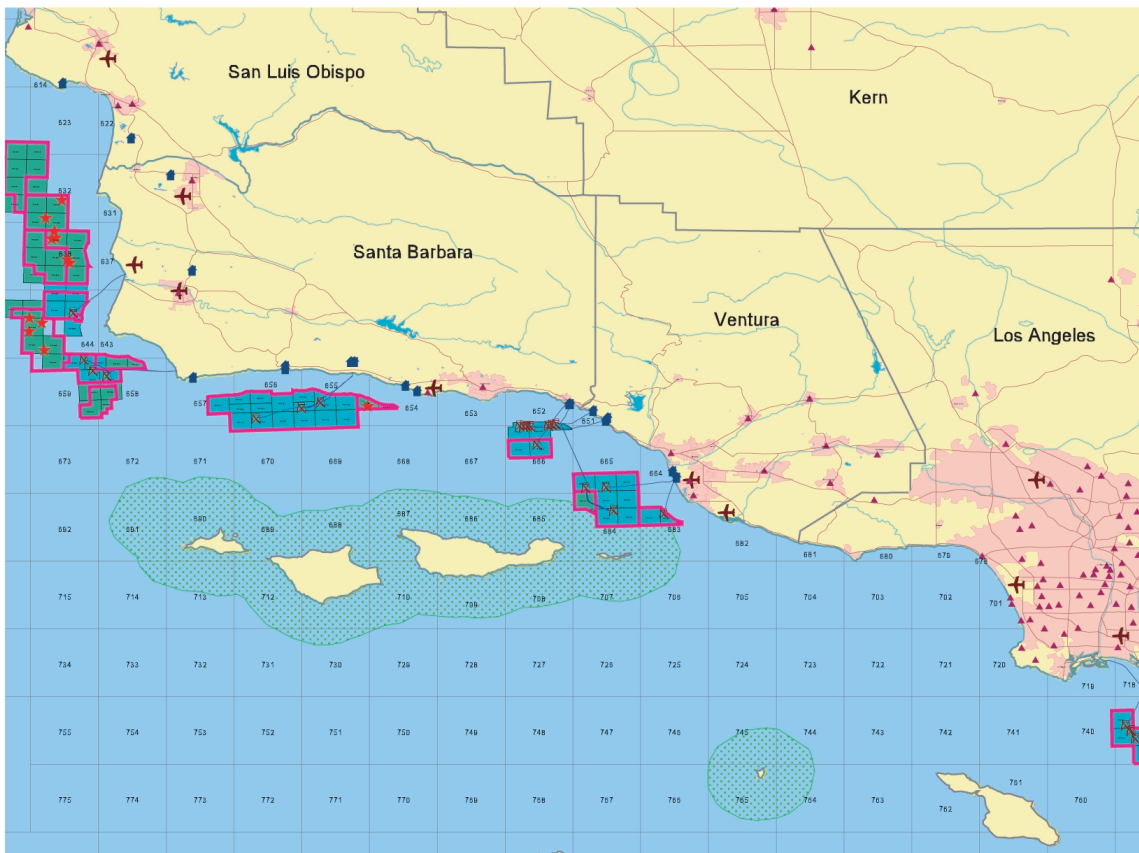
CDFG reports the total number of pounds of commercial fish species landed in California and the value of those landings annually for six reporting areas along the coast. The reporting areas are Eureka, San Francisco, Monterey, Santa Barbara, Los Angeles, and San Diego. The project area is located in the Santa Barbara reporting area and includes the ports of Santa Barbara, Morro Bay, Ventura, Oxnard, Port Hueneme, Avila, Oceano, and San Simeon. Landings

and values in the Santa Barbara reporting area for the years 1988-1998 are provided in table 4.12-2. Approximately 70 percent of the landings in the Santa Barbara reporting area are from Santa Barbara, Ventura, Oxnard, and Port Hueneme harbors.

Many fishers in the project area do not fish for just one species, or use only one gear-type. Most switch fisheries during any given year depending on market demand, prices, harvest regulations, weather conditions, and fish availability. The following section describes commercial fishing use of the proposed project area.

**Nets.** Fishing by net is a long-standing practice in the SCB, and includes trawling, set and drift gillnet, purse seine, lampara net, and dipnet gear. During the 1940's, nets were pulled mechanically, instead of by hand. Net reels were introduced in the 1950's, mechanically driven at first, then hydraulically powered. In the 1950's and early 1960's came other advances, which, along with increased effort from newcomers and fishermen returning home from war, helped usher in technological advances in net fisheries. It also began a latent descent into other issue areas, such as stressed stocks, competition with sportsmen, and marine mammal interactions. With developments like the "balloon trawl," which altered a drag net's design to lift it off the bottom and increase the size of its mouth, otter trawlers began catching more rockfish,

**Figure 4.12-1. CDFG Commercial Fishing Blocks**



**Table 4.12-2. Poundage and Value of Landings, Santa Barbara Reporting Area, 1988 - 1998.**

Year	Pounds Lande d	\$ Value
1988	75,645,800	\$25,875,000
1989	88,799,000	\$28,529,900
1990	65,500,300	\$30,360,000
1991	73,112,800	\$33,274,700
1992	42,090,700	\$32,212,000
1993	81,821,200	\$37,142,100
1994	91,129,000	\$42,194,800
1995	134,084,000	\$46,068,300
1996	158,265,000	\$53,606,800
1997	128,672,000	\$35,921,200
1998	27,181,400	\$21,000,900

which school just above the seafloor, not on the sea floor like halibut or sole. Santa Barbara trawl fishermen pushed rockfish landings (principally, bocaccio and chilipepper rockfish) beyond four million pounds in 1960, second only in weight to mackerel and far ahead of market fish like halibut (206,000 pounds), seabass (367,000 pounds), and barracuda (305,000 pounds).

By the mid-1960's, hydraulics had replaced many mechanical net-hauling devices and nylon nets replaced cotton, hemp, and linen. Fishing methods changed, too, and airplanes began assisting the fleet by spotting potential catch such as sardines and seabass. Meanwhile, "circle gillnetting" for barracuda and seabass was supplementing set nets and drift nets used to take these species. A cross between gillnetting and roundhauling, circle netting involved setting a gillnet in a circle without fully closing its ends, as one would with a purse seine. With a school of barracuda or seabass encircled, the crew would scare fish into the webbing, by shouting, banging on pots and pans, throwing firecrackers or driving the boat inside the deployed net.

**Purse Seining.** Presently, this fleet is based primarily in ports to the south of Santa Barbara; mainly Ventura Harbor and San Pedro. The species fished are primarily pelagic, such as anchovy, mackerel, and bonito. A major squid fishery has also developed in the past several years. Because purse seiners follow schools of these pelagic fish, it is difficult to predict where the fleet will be at a given time. Though the season is open all year, the Department of Fish and Game sets catch quotas. When these are filled, the fishery is over for that year unless an extended quota is subsequently issued.

The vessels, in the 35 to 70 feet size range, are distinguishable by the extra pursing skiff usually carried astern, and the tall boom and winch for pursing and hauling in the seine (figure 4.12-3). When a school of fish is spotted, the vessel maneuvers into position

near the school and launches the skiff, which drags the seine around the school of fish and back to the mother vessel. The purse line of the seine is rapidly winched in to close the bottom of the net, and the entire net is then brought in with a power block and winch. A successful set and haul usually takes from 30 to 90 minutes, depending on the size of the fish school, weather, and other factors. During the pursing process, the purse seine vessel is not maneuverable, and can be considered dead in the water.

Purse seiners from Monterey to San Pedro have fished the Santa Barbara Channel for sardines, mackerel and anchovies for decades. Sardine harvests, which from the late 1940's to the early 1980's were essentially absent from Monterey, but available in modest, fluctuating amounts in southern California, were bolstered by considerable anchovy landings during the period, especially in the 1950's, 1960's and early 1970's. When sardines were unavailable, roundhaulers, including Santa Barbara-based lampara boats and purse seiners, turned to anchovies. At the time, buyers sent trucks to Santa Barbara to retrieve the catch, helping the port's yearly anchovy landings rise as high as 50 million pounds in 1975. In the early 1980's, reduction fisheries declined amid political pressure and production of alternate animal-food sources, and sardine fishing staged a major, prolonged comeback that ultimately saw statewide quotas increase steadily to 132,000 tons in 1999. Purse seine activity in the Santa Barbara Channel and along the coast returned commensurately, as boats eschewed anchovies in favor of sardines, mackerel, and squid.

For decades, fishermen have plied the Santa Barbara coast and the Channel Islands for squid, supplying everything from the fresh-fish markets to markets for canned product in Europe and Thailand. Traditionally, the squid were taken at night with dip nets, after being lured to the surface with lights. In the late 1980's, however, dramatic changes molded the fishery into its modern form. Small "scoop boats" gave

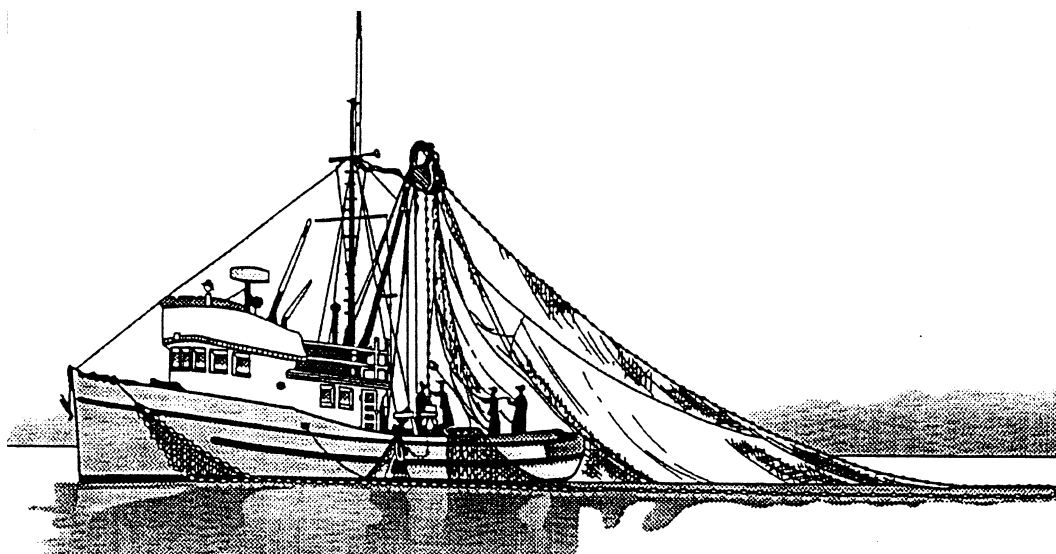


Figure 4.12-3a. Typical Purse Seine Vessel.

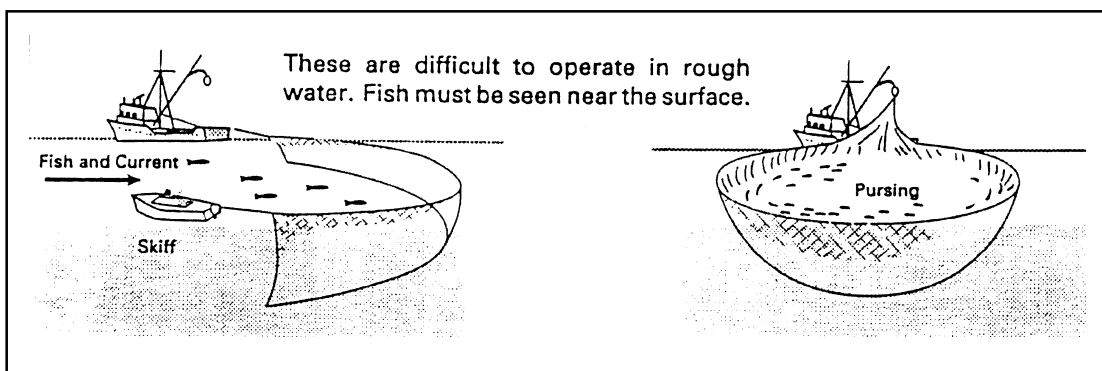


Figure 4.12-3b. Purse Seine Deployment

way to large purse seiners that worked with dedicated “light-boats” to harvest the catch.

Squid prices typically range from \$300-\$500 per ton, and some boats can haul 60 tons per night. The fishery, which typically begins in fall and ends in late spring, helped fuel a statewide record of 110,000 tons in the 1996-1997 season, when demand among Chinese consumers increased several-fold over a short period of time. Since then, however, a moratorium on new permits, a warmwater El Niño event, and shifting markets have presented challenges for the fishery, which currently includes 200-plus purse seiners and about 70 light-boats.

Because purse seiners follow schools of pelagic fish, it is difficult to predict how large or where the fleet will be at a given time. When working an area, the purse seine fleet is made up of a group of vessels. While searching, the vessels often move on erratic courses, trying to spot schools visually or on sonar. The bonito and mackerel fisheries are often aided by spotter planes. The season for coastal pelagics (i.e.,

squid, anchovy, mackerel, etc.) is generally open all year, however the CDFG sets catch quotas. When quotas are filled, the fishery is over for that year unless an extended quota is subsequently issued.

**Gill Nets.** Two types of gillnets are in common use in the SBC and SMB, and they are very distinct in the way they are fished. The first type is the set gillnet which is set in place with anchors on the seafloor and left unattended fish for a period of 24 hours or so. The second is the drift gillnet, which is a floating net with a lighted buoy at one end, attached to the fishing vessel at the other end.

**Set gillnets.** Since 1994, set gillnets have been banned for use within State waters, except in certain areas where deepwater rockfish nets are now being set. The species sought by these nets are halibut, seabass, angel shark, other sharks, rockfish, queenfish and kingfish.

A set gillnet is attached to an anchor-and buoy line at both ends (figure 4.12-4). Commonly, gillnet buoys have flags marking the ends, for ease of visibil-

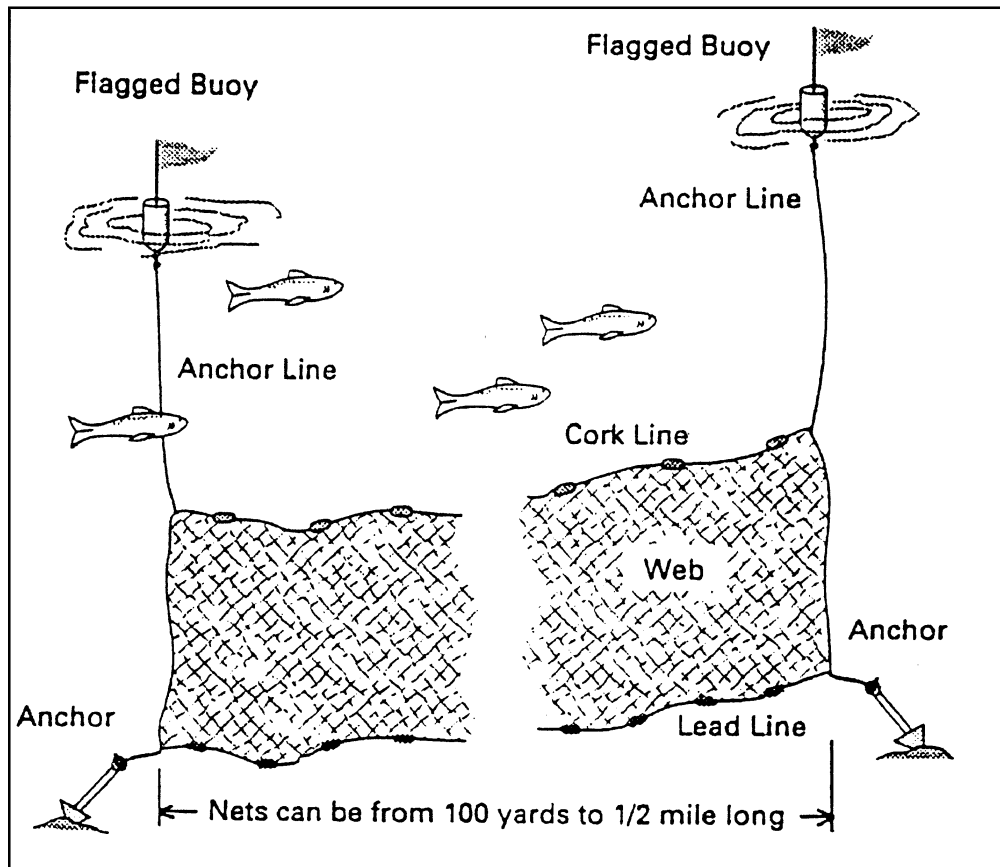


Figure 4.12-4. Set Gillnet Gear.

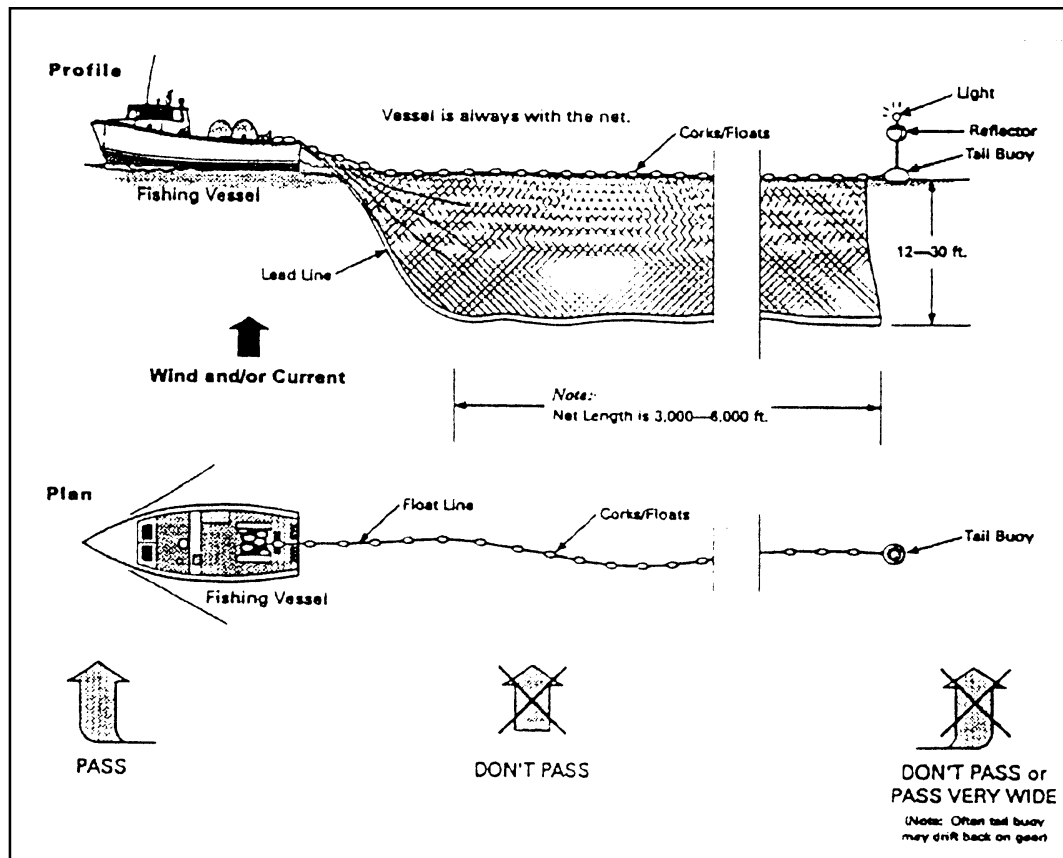


Figure 4.12-5. Drift Gillnet Gear

ity. Set nets range in length from a hundred yards to a half mile or so in length, depending on how many “gangs” or pieces of net webbing are hung together between anchor lines. The net is set during day or night and is usually retrieved within 24 hours. Fish are taken from the net as it is pulled aboard, or worked over the deck and redeployed in place, depending on whether the net is to be relocated or not. The decision to relocate gear is based on the catch rate of the net at the current location. Nets may be arranged so the net material itself is close to the surface, at midwater, or near the bottom.

The inshore set-net fishery went through dramatic changes during the 1980’s. Most important was the introduction of monofilament gill nets early in the decade. Nearly disposable in nature, they were much lighter and easier to handle than nylon nets and they performed just as well, if not better, catching plenty of fish but fewer sticks and less kelp. If hung with a lot of slack, they even made single-wall net fishing for halibut feasible, eliminating the need for three-walled trammel nets, which were difficult to build, use, and mend.

Beginning in 1988, two successive legislative campaigns were undertaken to ban nearshore nets from Point Arguello to the Mexican border. Proposition 132 included a ban on gill nets in a Marine Resource Protection Zone extending from Point Arguello to the Mexican border within 3 miles of shore, and around the Channel Islands within 1 mile of shore (or shallower than 70 fathoms (420 feet), whichever is closer to land). It passed on November 5, 1990. Following final implementation of Proposition 132 in 1994, statewide halibut landings dropped to 533,000 pounds, about half the historic average. Halibut trawlers had moderate success, especially near Santa Barbara. White seabass landings declined from 100,000 pounds in 1993 to 79,000 pounds in 1994.

**Drift gillnets.** Drift gillnets are not left unattended, and most often, one end of the drift net is attached to the fishing vessel. The drift net fishery operates in a much different area of the SBC and SMB regions than the set net fishery does. Fish species sought in this fishery are swordfish, and thresher shark, but some incidental catch of other pelagic species like opah is also now common since a strong market is developing for such species.

Drift gillnets are much longer than set gillnets, and may be as long as a mile or mile and a half (figure 4.12-5). This is significant from a gear interaction viewpoint because drift gillnet vessels may have restricted ability to maneuver with nets deployed. Drift gillnetting usually occurs at night and during the darker phases of the moon. The end of the net not attached to the vessel usually has a radar reflector/lighted buoy attached to it. Normally, the vessel will be at the leeward end of the drifting net equipment.

The drift gillnet can be fished anywhere from right at the surface to 30 or 40 feet below the surface.

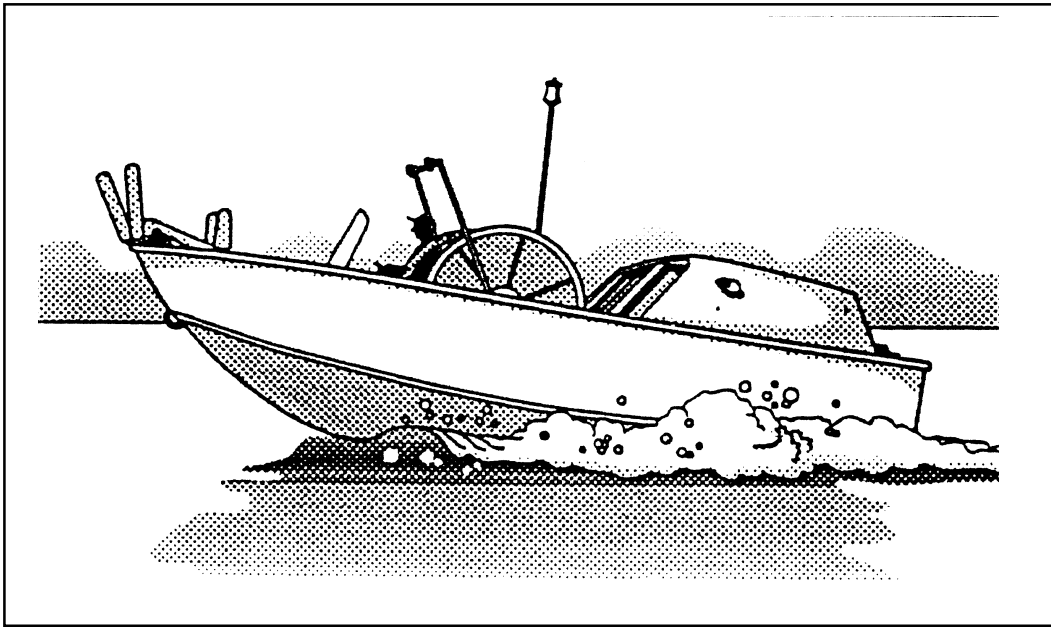
Drift nets have been used mostly to catch thresher shark and swordfish. With good fishing and strong markets, Santa Barbara landings of thresher shark rose from 36,000 pounds in 1977 to a high of 687,000 pounds in 1983. Meanwhile, as drift netters scoured new areas for sharks, including the Channel Islands, they also began fishing for broadbill swordfish. Until the late 1970’s, broadbill swordfish had been taken only by harpoon. But discovery that this profitable fish could be taken in shark drift nets forced a gear revolution, with mesh sizes increasing to 18 to 20 inches in order to catch swordfish.

Slowly, the drift net fleet began to bifurcate. Smaller boats stayed inshore, targeting sharks and the occasional swordfish. Larger boats, meanwhile, ventured further offshore, up to 150 miles out, and as far north as Oregon, searching for swordfish. Many swordfish fishermen built new boats, exchanging wooden vessels for aluminum or steel ones better suited to offshore conditions. As a measure of the drift netters’ success, California swordfish landings rose to a record 2.8 million pounds in 1989. As the shark and swordfish gillnet fisheries developed and expanded, several regulations, including area closures and seasons, were implemented to conserve targeted stocks and protect marine mammals, including migrating gray whales. In 1997, fishermen began deploying sonic pingers on their nets, devices that emit signals through the water that deter whales from the gear.

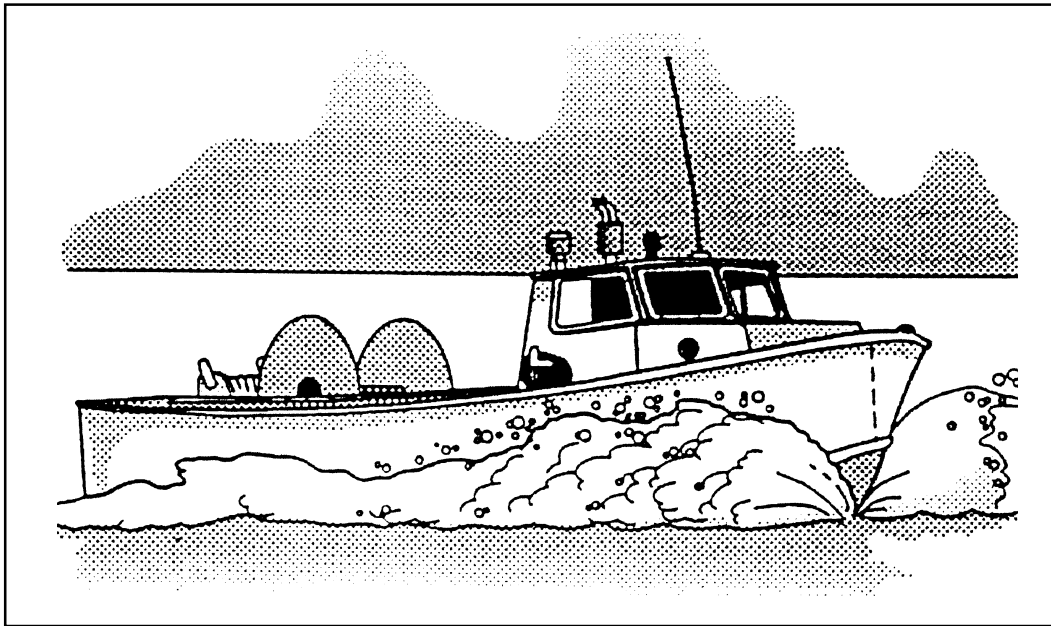
The vessels used in both the set gillnet and drift gillnet fisheries vary in size and shape, but may be classified into two categories: 1) smaller (28-40 feet), faster craft similar to the crab and lobster craft of the region, and 2) larger (40-60 feet), more traditional fishing hulls. However, the gillnet boat is readily distinguishable from other vessels of similar design and size by the presence of a large (4 to 10 feet) reel on which the gillnet is spooled when not in use. The reel may be mounted on a fore deck or aft deck (figure 4.12-6).

**Trawl.** The trawl fishery is a mobile fishery in which a trawl net is towed behind the fishing vessel at slow speed, either in midwater, or more commonly along the bottom. The species most commonly sought by trawlers are ridgeback shrimp, spot prawns, rockfish, various species of sole, and sea cucumbers. Seasonally, the trawlers are allowed to drag in shallower state waters for halibut, and incidental catch of shark and some other fish is allowed.

Most of the vessels are large for commercial fishing vessels of this area, ranging from 40 to 80 feet in length (figure 4.12-7). These vessels are readily identifiable when the net is not deployed because of the net “otter boards” which are usually hung near the stern of the vessel, and the single boom and winch for



*Figure 4.12-6a. Gillnet Vessel - Bowpicker*



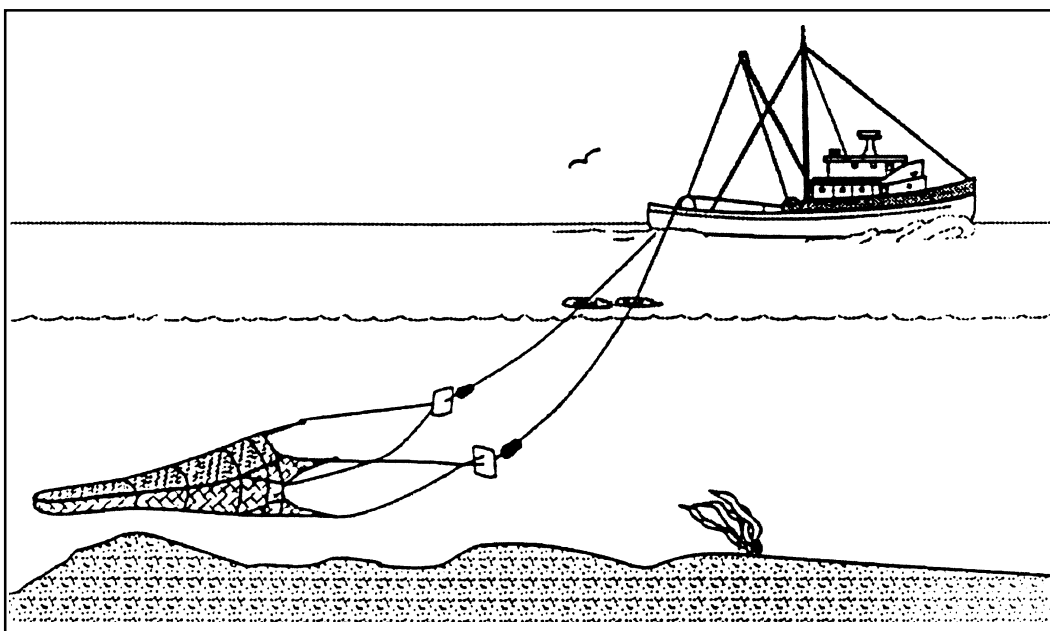
*Figure 4.12-6b. Gillnet Vessel - Stern Reel.*

net retrieval usually mounted forward on the open stern deck. Some draggers use a Gulf-style double net rig (twin trawlers) which is towed from the ends of two heavy outrigger poles readily visible extending laterally 20-30 feet from the beam of the boat.

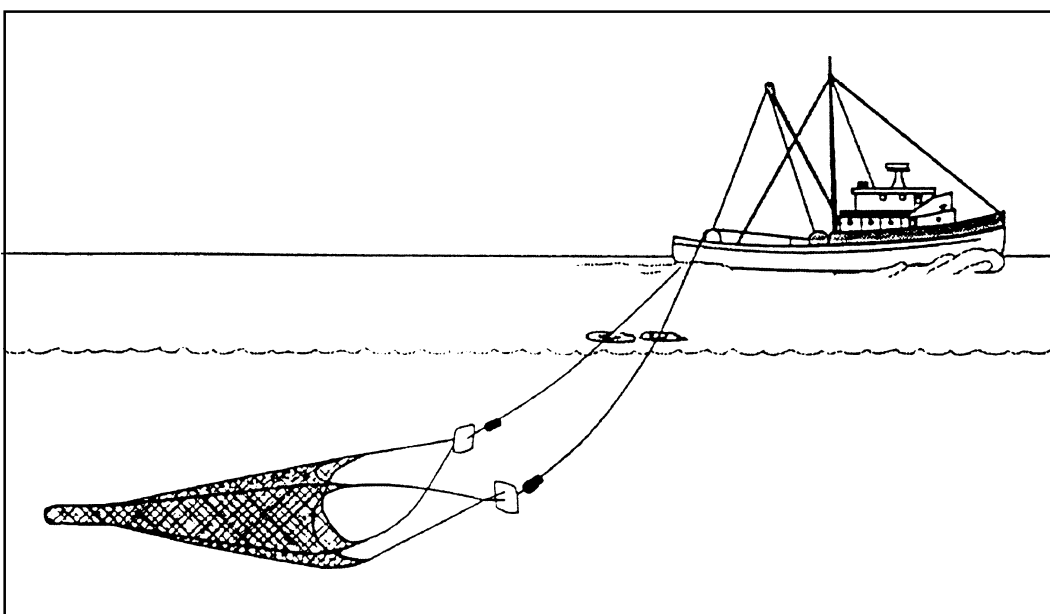
Trawlers navigate slowly along a depth contour through the dragging grounds for several hours. The net is then hauled on deck with a hydraulic winch and boom. The fish are emptied from the cod end of the net, sorted, and the process is repeated. Depending

on the species sought and the season, trawlers of the SBC drag anywhere from the 50 to 150 fathom depth contour along the coastline, along the Channel Islands, and along topographic features of the seafloor in midchannel. In the SMB, draggers may work out to 400 fathoms in their search for various species of sole.

Trawlers with nets deployed are not readily maneuverable for several reasons. First, the net is the bottom, and can be up to a mile behind the vessel, depending on water depth. Second, the trawlers of-



*Figure 4.12-7a. Bottom Trawl.*



*Figure 4.12-7b. Mid-Water (Pelagic) Trawl.*

ten work along the top edges of steep dropoff slopes. If the trawler is forced to turn in to deeper water, the net would have to be picked up and reset, causing lost fishing time. Similarly, rocky outcrops, wrecks, or other debris are located randomly with respect to the trawl grounds. These features are hazards to the trawler because of their potential to snag and hang up the net. Through trial and error, trawlers become aware of most of the snags to avoid in favored grounds. Knowledge of these snags also limits the potential maneuverability of the trawler when towing a net(s).

Turning into such a snag may mean loss or damage to the net(s), and potential hazard to the vessel itself if the hang is significant and/or weather/sea conditions are unfavorable. Since turning into such obstructions would be hazardous, most trawlers would have to stop towing and pull their gear in rather than turn.

During the late 1970's and early 1980's, at the same time prawn trawling and shark/swordfish drift netting were developing, some Santa Barbara draggers began a quest that would ultimately establish a steady, local fishery for sea cucumbers. The fishery