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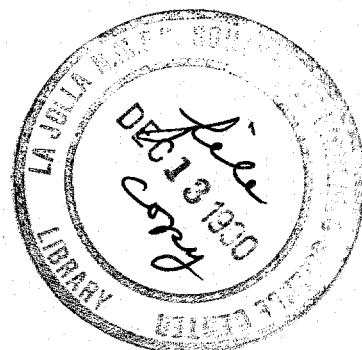


SEPTEMBER 1990

SURVEY OF THE ABUNDANCE AND DISTRIBUTION OF PELAGIC YOUNG-OF-THE-YEAR ROCKFISHES, *Sebastes*, OFF CENTRAL CALIFORNIA

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Science Center

NOAA Technical Memorandum NMFS

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Survey of the Abundance and Distribution of Pelagic
Young-of-the-Year Rockfishes, Sebastes, off Central California

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and

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ABSTRACT

This report describes the goals, methods and results of the first five years (1983-1987) of an ongoing trawl survey of pelagic young-of-the-year rockfishes, (Sebastes), off central California. Most samples were collected with a mid-water trawl, but in 1984 gill nets and a bottom trawl were also used.

The principal objectives of the study are 1) to estimate year class strength, 2) to study the environmental factors that may affect year class strength, and 3) to elucidate the ecology of juvenile rockfish during their pelagic offshore (5-50 km) stage. From 1983 to 1985 we attempted to sample the most extensive area possible (Cape Mendocino to Point Sur) and to develop an identification guide for juvenile rockfishes. After 1986, sampling has been limited to the area between Cypress Point and Point Reyes, with emphasis on sampling this area two or three times each year.

Summary tables of the abundance of juvenile rockfish, flatfishes, Pacific hake, Merluccius productus, sablefish, Anoplopoma fimbria, and lingcod, Ophiodon elongatus, as well as associated adult fishes and invertebrates, are presented. Maps of the sampled stations with the abundance and distribution of juvenile rockfishes are also presented. Some aspects of the survey design are evaluated.

INTRODUCTION

The juvenile rockfish survey is an annual mid-water trawl survey conducted off central California by our laboratory. The survey is designed to yield estimates of the abundance and distribution of age-0 rockfishes during their pelagic phase. The principal goals of the study are 1) to estimate year-class

strength, 2) to study local environmental factors that may affect year-class strength, and 3) to elucidate the ecology of age-0 rockfishes during their offshore (5-50 km) stage.

The Groundfish Analysis Investigation of the Tiburon Laboratory began a long-term study on rockfish recruitment in 1983. The early life history stages of commercially exploited fishes can be useful in estimating strength of recruitment into a fishery. Planktonic studies, such as the California Cooperative Oceanic Fisheries Investigation (CalCOFI), can provide estimates of larval abundance. Attempts to predict recruitment strength into a fishery from larval abundance have not been successful because of high mortality which is variably affected by environmental conditions. For the rockfishes, prediction is also complicated by the difficulty of identifying larvae. Therefore, we decided to target the pelagic juvenile life history stage when the fish are found in mid-water (Mais 1974, Hartmann 1977).

During the first year of this study, a preliminary guide to the identification of age-0 rockfishes was compiled. The guide enabled us to identify 99% of the rockfishes sampled.

This report describes the methods used to sample the age-0 rockfish population off central California from 1983 to 1987. Summary tables of the abundance and distribution are presented for pelagic rockfishes, and for other commercially important or abundant species that occurred in the trawls. Maps of the abundance and distribution of pelagic juvenile rockfishes are presented.

METHODS

Survey design

The initial survey conducted in 1983 was the first survey aimed at sampling pelagic juvenile rockfishes. Therefore, the original survey design was tentative and it was modified as the study progressed. The survey design in 1983 was planned with the intention of studying the area between Point Sur in the south to Cape Mendocino in the north. Eighteen days of ship time were available to sample an area 288 km long. Transect lines which required one day to sample were set at 27k intervals along the coast. This time was also committed to sampling the Monterey Bay area (2 days), seaward of the Farallon Islands (2 days), and an offshore track line (3 days). As the sample design was modified, established track lines were maintained each year for consistency.

A track line, usually parallel to lines of latitude was designed for sampling during one night. Stations along a track line were positioned at various depths and over different

features of bottom topography so that a wide variety of habitats would be sampled. Five to seven stations were established along each track line. Station numbers were assigned by track line as stations were established. A total of 107 mid-water and 28 bottom trawl stations were sampled between 1983 and 1987 (Figs. 1 and 2).

Three days into the first year's cruise, it was noted that the mid-water trawl fished during daylight hours was not catching juvenile rockfish (or any mesopelagic organisms). Stations targeted to be sampled during daylight were replicates of stations to be sampled during the night, hence the day trawls were omitted without the loss of stations. Although track lines were established as far north as Cape Mendocino, weather prevented sampling track lines further north than Point Reyes in 1983, Jenner in 1984, and Point Cabrillo in 1985. In 1986, major changes were made in the sampling plan.

The area of study was reduced in 1986 to range from Cypress Point in Monterey Bay north to Point Reyes. Seven track lines were selected so that a sweep through the area could be completed in 7 days with 2 to 3 replicates, depending on the length of a cruise and weather conditions. Replicate sweeps were made to obtain data on the intra-annual temporal variations in the abundance and distribution of the pelagic life history stage and to reduce the effect of inter-annual differences in timing on our estimates of recruitment success.

Sampling methods

A mid-water trawl net, with a square mouth with 86-foot sides and a cod-end liner of 3/8-inch stretch mesh was used (Fig. 3). Forty-two 8-inch floats and 145 pounds of chain spread the net vertically. Two 5 x 7-foot weighted wooden doors spread the net horizontally (Fig. 3). The net was a Cobb trawl with the design slightly modified by G. Stauffer and J. Jurkavich (Alaska Fisheries Science Center, Seattle, Washington). This net design was also used for the anchovy survey conducted by the Southwest Fisheries Center Coastal Research Division and the California Department of Fish and Game, Long Beach (Mais 1974).

The targeted sampling depths were 10 (as shallow as possible), 30 and 100 m. In water shallower than 91 m, 30 m of 5/8-inch cable was played out. The standard amount of cable played out was 90 m in deeper water. When bottom depth and time allowed, three depths were sampled with 30, 90, and 300 m of cable out in order to investigate bathymetric distribution. It is not practical to use less than 30 m of warp because the net does not fully open with less warp.

The net was towed at depth for 15 minutes at 650 rpm by the

NOAA vessel R/V David Starr Jordan. The distance covered varied with the direction and speed of currents and winds, but was approximately 0.9 - 1.4 km. The net was towed with a constant amount of cable out and at a standard rpm to try to keep the net at a standard depth. Once the net was deployed, all aft deck and running lights were extinguished while the wire was being let out. With the trawl on board, the cod end was opened and emptied of its contents. The cod end was shaken down twice and inspected on the deck to insure that all of the catch was collected and the net clean for the next haul. It was necessary to tie the liner of the cod end so that small fish are not pushed through. In 1986 the liner was not always tied and some loss of juvenile fishes (mostly Pacific hake, Merluccius productus) from the cod end was noted.

The depth at which the net fished was only approximate. Calibration of the wooden doors yielded a net depth of 11 m for 30 m of cable, 35 m for 90 m of cable, and 100 m for 300 m of cable (W. Flerx^{1/}). In 1986 the wooden doors had to be replaced by steel doors after haul 63 (sweep 2, station 111). In 1987 the steel doors were calibrated with a net sonde. Because calibration indicated that the relationship between net depth and amount of cable had changed, we began using 85 and 240 m of cable for the deep tows in 1987. The calibration also indicated that since the change in the doors the depth of the shallow tow is now 5 m. The amount of cable for the shallow tow was not changed because the intent for those tows is to fish as shallow as possible.

A semi-balloon otter trawl with a 40-foot headrope, and a cod-end liner of 1/2-inch stretch mesh was used in 1984 to examine the distribution of pelagic juveniles settled to the bottom during daylight. Six 5-inch floats and 3/16-inch chain hung loop-style on the footrope was used to spread the net vertically. Two 20 x 30-inch wooden doors were used to spread the net horizontally. Bottom trawls were made near the same stations fished by the mid-water trawl when the bottom topography permitted.

A one-meter circular plankton net, mesh size 505 um, was used to collect planktonic organisms available to rockfishes as potential food. One sample was taken each night at the first trawl station. The net and an inclinometer were attached to the cable of the starboard hydraulic winch. Fifty-one m of cable were released at the rate of 25 m/minute. The net was towed at an angle of 50° from the vertical for 30 seconds and then retrieved at 25 m/minute with minimal headway.

A gill net was used experimentally in 1984. The net was 150 feet long and divided into three 50-foot panels of 3/8-, 1/2-

and 3/4-inch mesh. It was set out at two locations and did not catch any juvenile fishes.

Hook-and-line fishing for adult rockfish and lingcod, Ophiodon elongatus, occurred during daylight hours in 1983 and 1984 (as weather permitted). Stomach contents were analyzed to investigate predation on juvenile rockfishes by adults and lingcod.

Sample processing

All organisms captured by the mid-water trawl were collected, identified to the categories listed in Table 1, and counted on board ship. Representatives of most taxa were preserved for a reference collection. During 1983 and 1984 most juvenile rockfish were sorted to species or species group and preserved in 10% buffered (with borax) Formalin^{2/}. In 1985 some juvenile rockfish were frozen, and since 1986 specimens have been frozen, except for a subsample used for analysis of stomach contents. Frozen sub-samples for age determination have been collected each year and are in the process of being aged. At the Southwest Fisheries Center, Tiburon Laboratory, all samples were positively identified, recounted and lengths measured. A reference collection was established. Specimens not needed for the reference collection were discarded after processing.

All Sebastes from the bottom trawls in 1984 were counted, identified to species, and preserved in 10% Formalin. All other organisms caught by the bottom trawl were counted, identified to family, and discarded.

Temperature and salinity

Temperature was measured by four methods. Surface-water temperature was measured ± 0.5 C at each station with a bucket thermometer. XBT's were launched at the first station each night. In 1985 conductivity, temperature, and depth recorder (CTD) (Applied Microsystems) measurements were taken by personnel from the University of California at Santa Cruz and the Point Reyes Bird Observatory. In 1986 a CTD was available from the University of California Bodega Bay Marine Laboratory. It was operable for only part of the cruise. Temperature profiles were taken at every station possible. A Seabird Seacat profiler was deployed in 1987 at 60 m/minute to a maximum depth of 200 m and retrieved at 110-140 m/min. Profiles were taken of the study area during daylight hours, and also at night at each trawl station. Temperatures were recorded on a thermosalinometer from water continually pumped from an intake line approximately 2 m below the surface. Temperatures to $\pm 0.13^{\circ}\text{C}$ were recorded at every station. In 1987 automatic recording of position, surface

temperature and salinity occurred every 10 seconds, 24 hr/day for the entire cruise.

Satellite maps of sea-surface temperature were available for central California during the cruise and were provided by the National Weather Service, Redwood City, California. Images of interest were recorded by the N9 satellite on two bands; 1) the visible band which recorded cloud cover; and 2) the infrared band which mapped surface temperatures. The pattern of surface temperature observed from the AVHRR (Advanced Very High Resolution Radiometer) images reflect surface currents and can indicate thermal fronts and cold and warm water masses.

Meteorological data

Wind direction and speed were recorded at the beginning of each tow. Wind direction dictated direction of the tow (into the wind). Wind speed influenced the distance traveled during a tow. Cloud cover was classified as clear, partially cloudy, overcast, and rainy. Barometric pressure was also recorded.

RESULTS

1983.--Eighteen days of ship time were available. Of the planned 95 hauls, only 37 were completed due to high winds or high seas. Juvenile rockfish occurred at 9 stations (Fig. 4). Due to El Niño conditions, warmer than usual water temperatures prevailed (Pearcy and Schoener 1987). Oceanographic conditions and the distribution of organisms (Tables 2 - 9) were very different during the summer of 1983 than expected.

1984.--Fourteen days of ship time were available. Of the planned 84 mid-water trawls, 55 were completed. Juvenile rockfish occurred at 34 stations (Fig. 5). The catch data are summarized in Tables 10-18. Experimental use of a gill net failed to catch any juvenile rockfish. Observations made with SCUBA revealed that even the larger juvenile rockfishes were able to swim through the 3/8th inch mesh. Use of a bottom trawl resulted in the capture of juvenile rockfishes at 11 stations (Fig. 6), but catches of species that are important in fisheries were low. In the 31 trawls made, the species composition was quite different than that landed in the mid-water trawls (Tables 19-25). No future use of the bottom trawl is planned.

1985.--Twenty-five days of ship time were available. Of the planned 160 trawls, 100 were completed. Juvenile rockfish were captured at 56 stations (Fig. 7). The catch data are summarized in Tables 26-40.

1986.--Twenty-two days of ship time were available. Of the 126 stations planned, 101 were completed. All 42 stations were

sampled at least once with all but three stations sampled twice (Figs. 8-10). Whenever possible, a third replicate was taken. Replacement of the wooden doors with uncalibrated steel doors on haul 64 (sweep 2, station 111) resulted in the net being trawled at depths approximately 5, 32, and 140 m. The catch data are summarized in Tables 41-58.

1987 - April.--Twelve days of ship time were available in April. Mid-water trawls were taken at the standard stations established in 1986. As time and weather permitted, additional trawls were made around Cordell Bank and Pioneer Seamount. Seventy-four mid-water trawls were completed, 15 more than scheduled (Fig. 11). This was due to excellent weather conditions and more hours of darkness in April. The catch data are summarized in Tables 59-68.

1987 - May-June.--Thirty days of ship time were available from May 20 to June 21. Three replicate sweeps of the study area were made. All the planned trawls of the study area were completed (Fig. 12-14). In addition, the area around Pioneer Seamount was sampled during sweep 2. A few mid-water trawls were set during daylight hours to sample juvenile hake. Surface tows were made at 14 stations to estimate numbers of neustonic organisms caught incidentally during the deployment and retrieval of the net. The catch data are summarized in Tables 69-93.

More than 47,000 juvenile rockfish were collected by mid-water trawl during the five years of the survey. Juvenile rockfish species composition data are summarized for the five years of trawling in Tables 94-96. While 26 species of rockfish have been captured, shortbelly rockfish, (Sebastes jordani), dominate the catches (Tables 94-96). In addition to shortbelly rockfish, bocaccio, S. paucispinis, chilipepper, S. goodei, widow, S. entomelas, and yellowtail, S. flavidus rockfish often comprised significant proportions of the catch.

EVALUATION OF SURVEY DESIGN

Depth of tow

The bathymetric distribution of juvenile fishes and the appropriateness of the standard 30 m sampling depth were examined by setting trawls at 2-4 depths at one station per track line. Comparisons made with 90 m versus 300 m of wire out indicated the 90-m tows to be appropriate for sampling all species of rockfish. Comparisons from the 1986 cruise of the 30-m, 90-m, and 300-m tows indicated that the highest catches of most species of rockfishes were made with 90 m of wire out. Therefore, the standard warp remained at 30 m of wire when the bottom was 50 fathoms and less, otherwise, 90 m (85 m after 1986) was used. Details of the depth analysis will be published elsewhere.

Timing of survey

Prior to 1986 the strategy was to cover the most extensive area possible once during June. The results in 1985 indicated that in some years many of the juveniles become unavailable to the sampling gear by mid-June. It was decided that a better strategy would be to sample a smaller area several times during the season.

Sampling replicate stations 10 days apart revealed a general decline in the abundance of the pelagic juveniles from late May to late June. In 1986 there was a marked decline in both the diversity and abundance of species, with sweep 1 the highest and sweep 3 the lowest for stations where replicate samples were made. In May-June 1987 three complete sweeps of the area were made. Species number was unchanged, but the abundance was highest in sweep 2, second highest in sweep 1, and comparatively low in sweep 3. The trend is for the population of pelagic juveniles to decrease dramatically in the study area between the second and third sweeps (Tables 95-96). In 1986 catches decreased from the first to the second sweep, but in 1987 catches increased between the two sweeps. It is possible that in some years that juveniles are moving into the survey area from offshore on a path to nearshore areas of settlement. In both 1986 and 1987 the distribution of catches indicated an onshore movement of rockfish between sweeps 1 and 2. We conclude that the strategy to sample a limited area several times during the season of expected settlement is correct.

FUTURE WORK

We plan to continue the survey until enough data are collected to evaluate the relationship between juvenile rockfish abundance and year class strength. Year classes of important species sampled by the survey in 1983 are just beginning to enter the fisheries. Studies on juvenile feeding ecology, physiological condition, birthdate distributions (Table 97) and relationships between oceanographic conditions and juvenile abundance and distribution are in progress.

ACKNOWLEDGEMENTS

We are grateful to all research personnel and the officers and crew of the R/V David Starr Jordan who participated in the juvenile rockfish recruitment surveys in 1983-1987. We acknowledge the helpful suggestions of Ralph Larson, Paul Smith and three anonymous reviewers.

1/W. Flerx, Alaska Fisheries Center, National Marine Fisheries Service, NOAA, 7600 Sand Point Way NE, Seattle, WA 98115, pers. commun.

2/Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

3/Wyllie Echeverria, Tina. The diet of fishes sampled from the bottomfish fishery (Sebastes spp., Sebastolobus spp. and Ophiodon elongatus) of central California: emphasis on predators of juvenile Sebastes. Manuscr. in prep. Southwest Fisheries Center, National Marine Fisheries Service, NOAA, Tiburon Laboratory, 3150 Paradise Drive, Tiburon, CA 94920.

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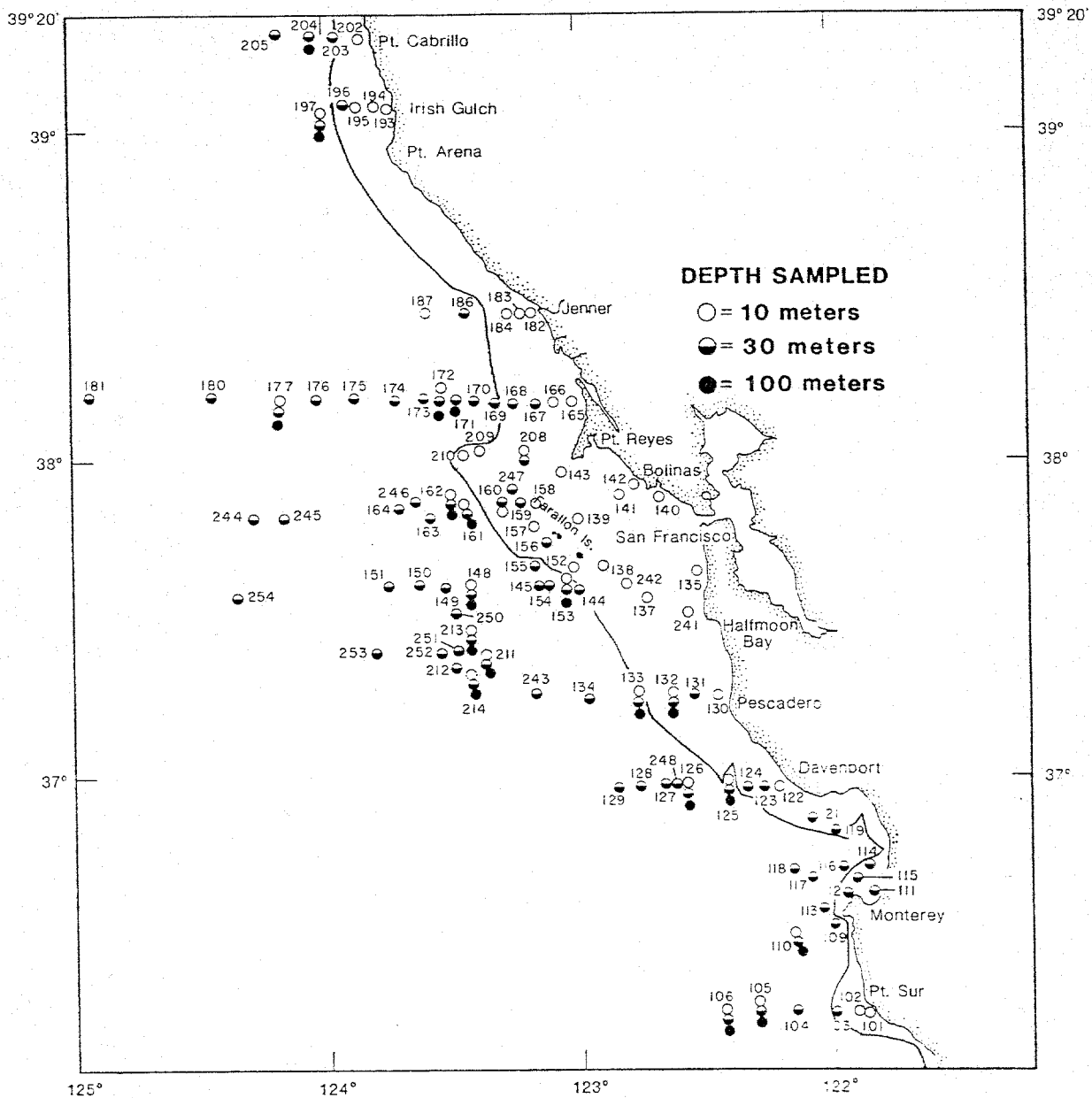


Figure 1. Map of stations sampled by mid-water trawl off central California, 1983-1987, with 183 m depth contour.

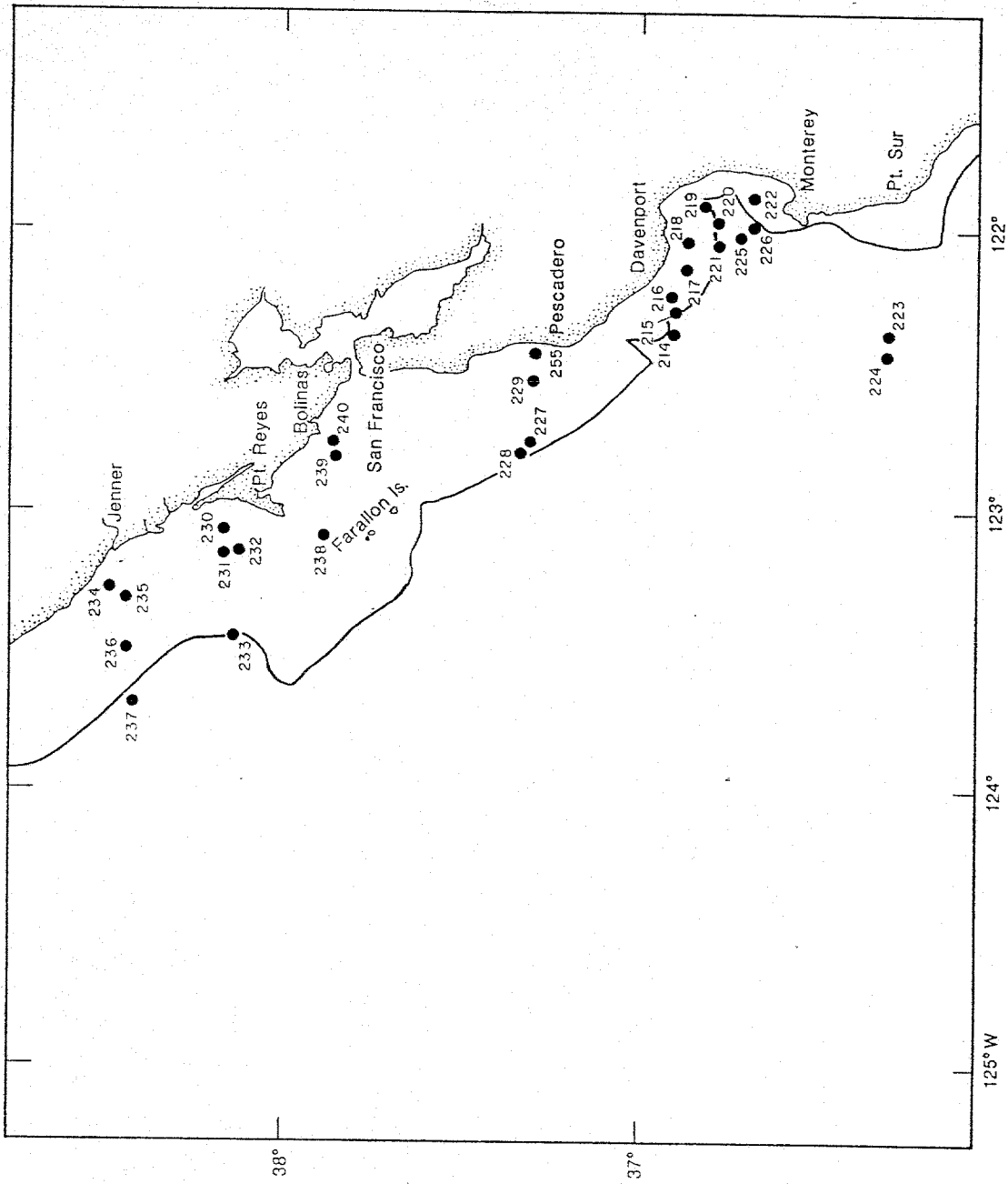


Figure 2. Map of stations sampled by bottom trawl off central California, 1984 with 183 m depth contour.

WINGS:

Use 6" #54
Trawl is constructed from 4 panels (top, bottom, and 2 sides cut to this plan.

WEBBING:

Knotted filament nylon, chaff resistant treated.
Color: black
All mesh sizes stretched measured.

HANGING:

50% (4 meshes to 12 inches of mouth rope at bosom).

MOUTH AND RIBLINES:

Use 5/8" diameter SAMSON STABLE-BRAID or equal. Termination at wing tips to extend 1 foot beyond trawl and terminated by a thimble.

CHAINS:

145 lb. 5/8" chain on each wing.

FLOATS:

42 each 10" floats.

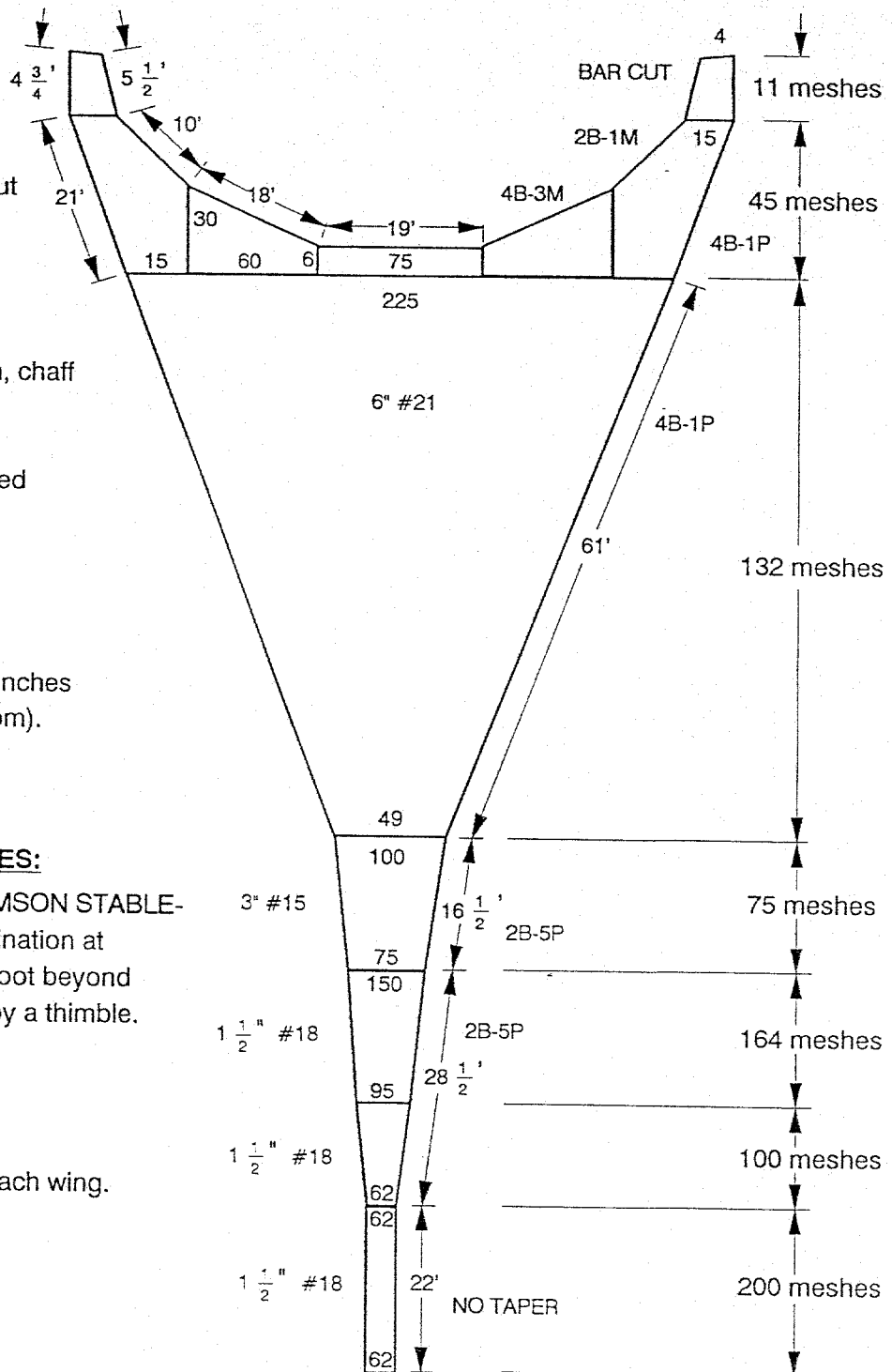


Figure 3. Diagram of mid-water trawl specifications.

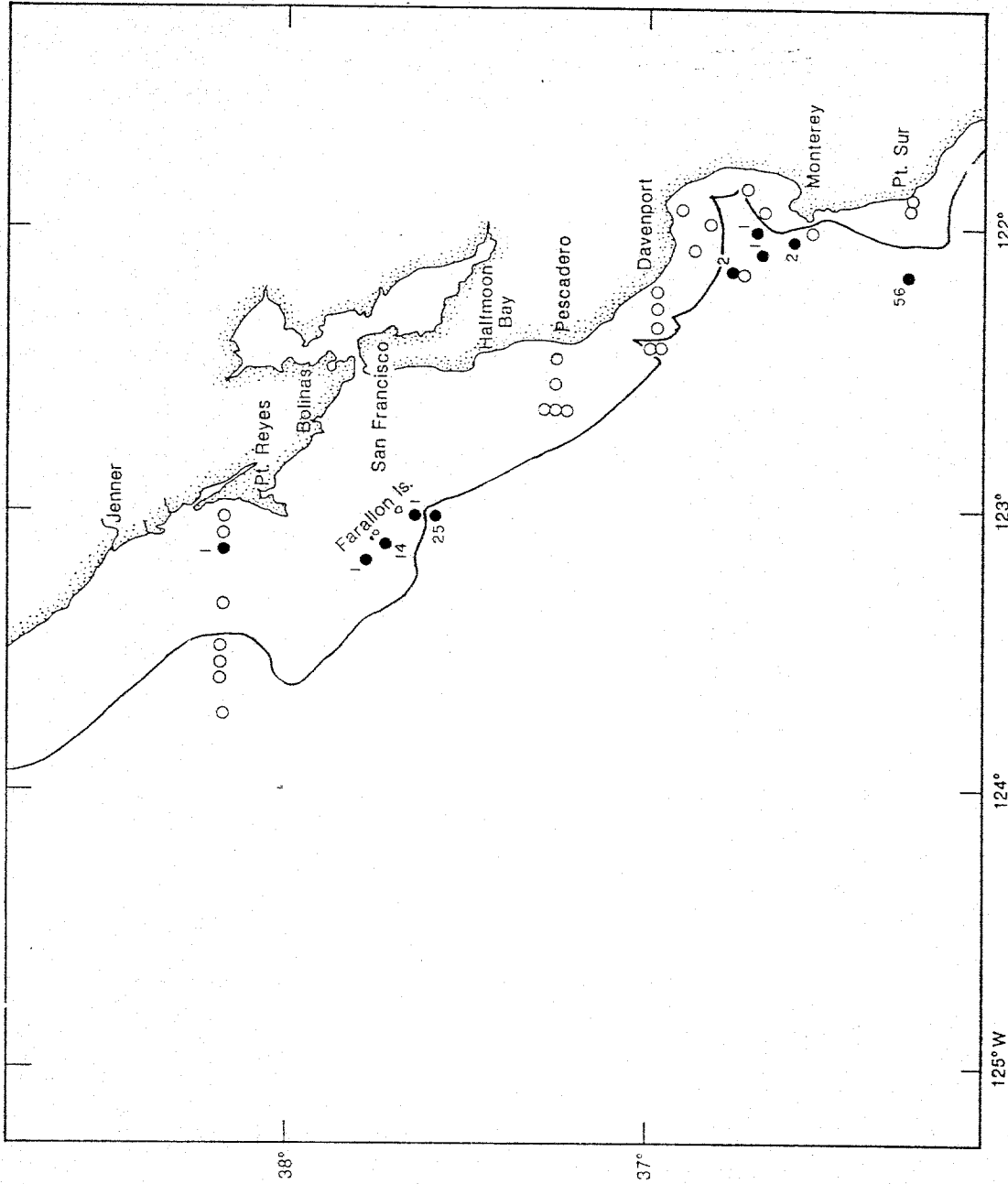


Figure 4. Abundance and distribution of juvenile *Sebastes* caught by mid-water trawl off central California in 1983. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

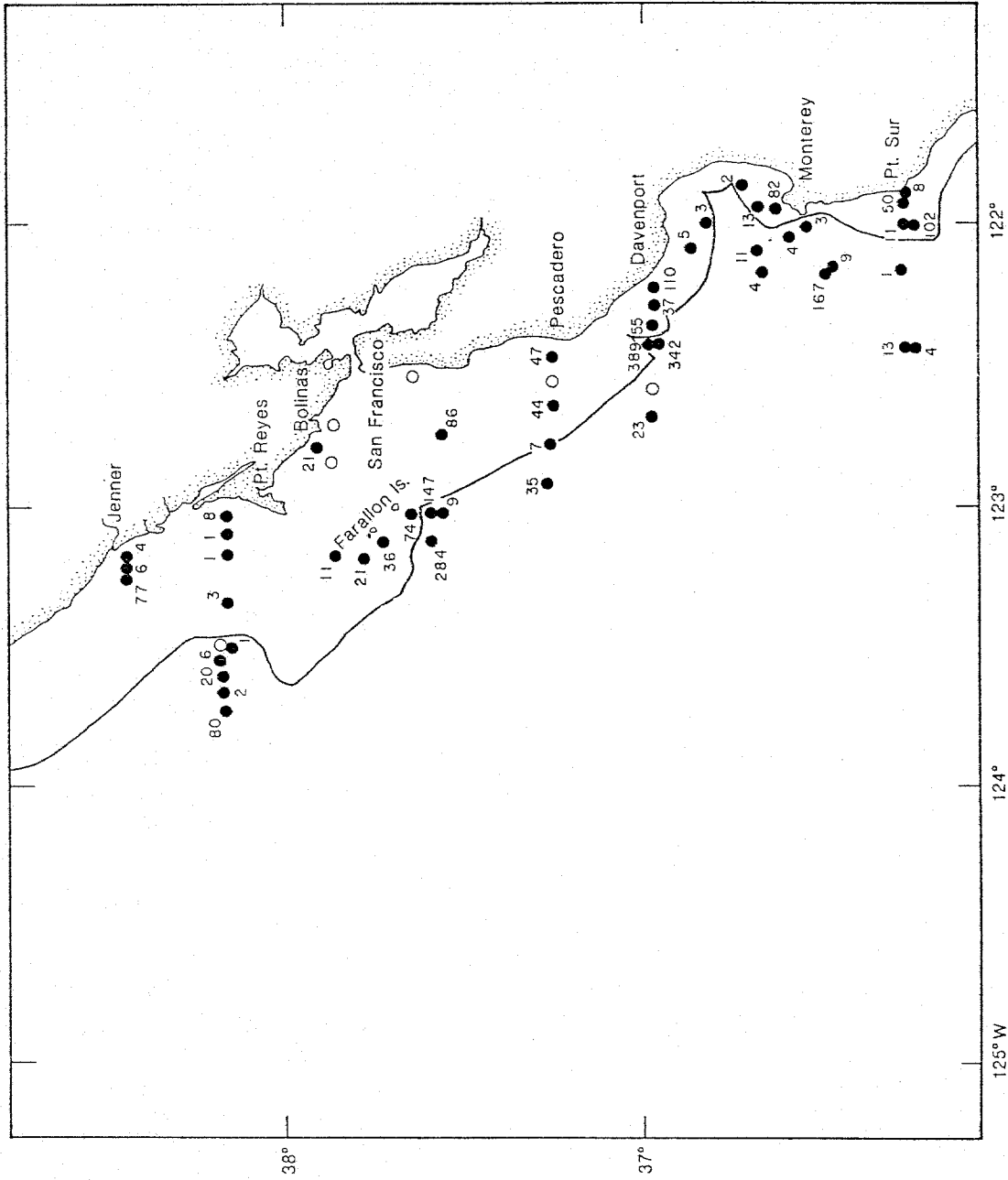


Figure 5. Abundance and distribution of juvenile *Sebastes* caught by mid-water trawl off central California in 1984. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

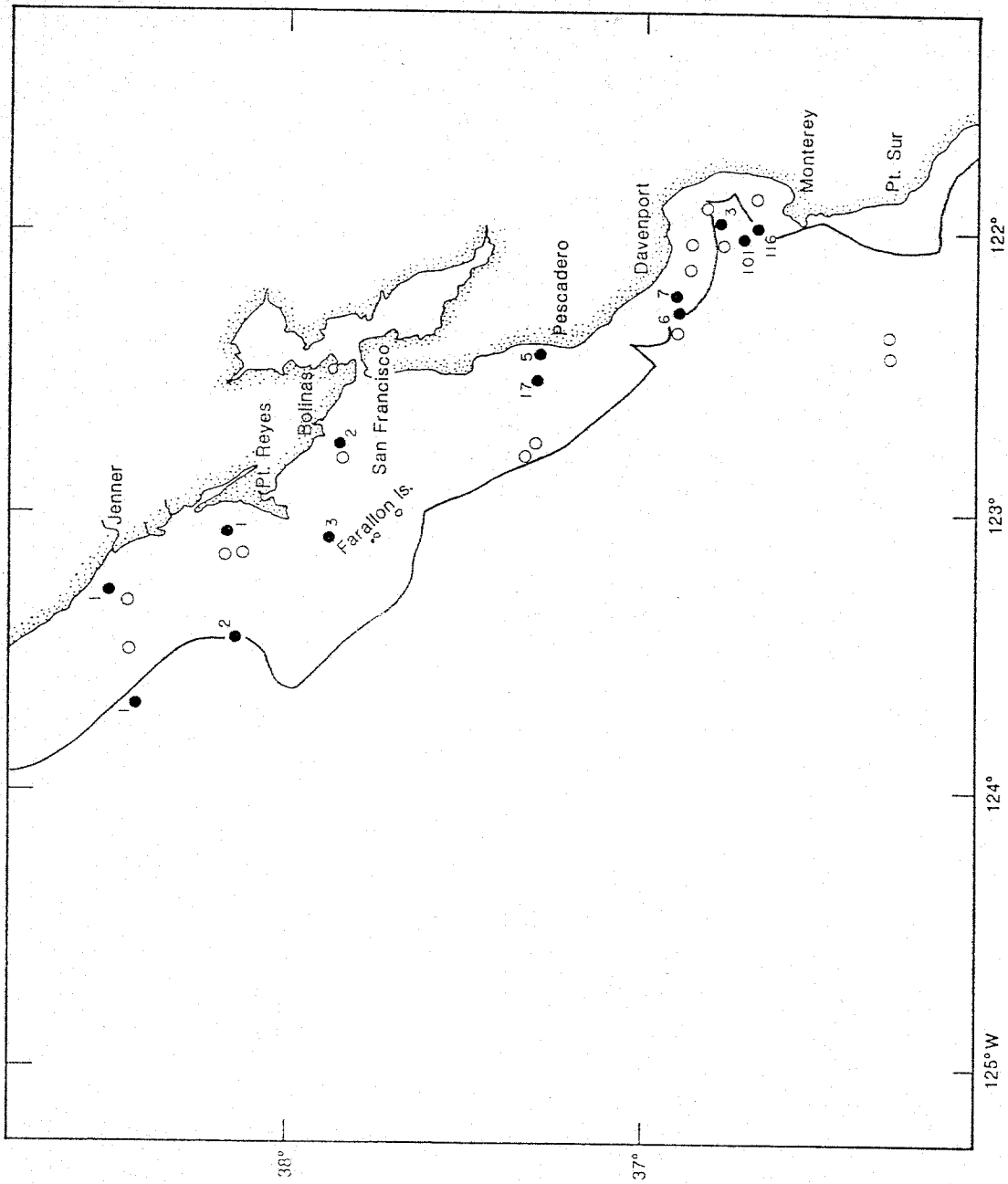


Figure 6. Abundance and distribution of juvenile Sebastes caught by bottom trawl off central California in 1984. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

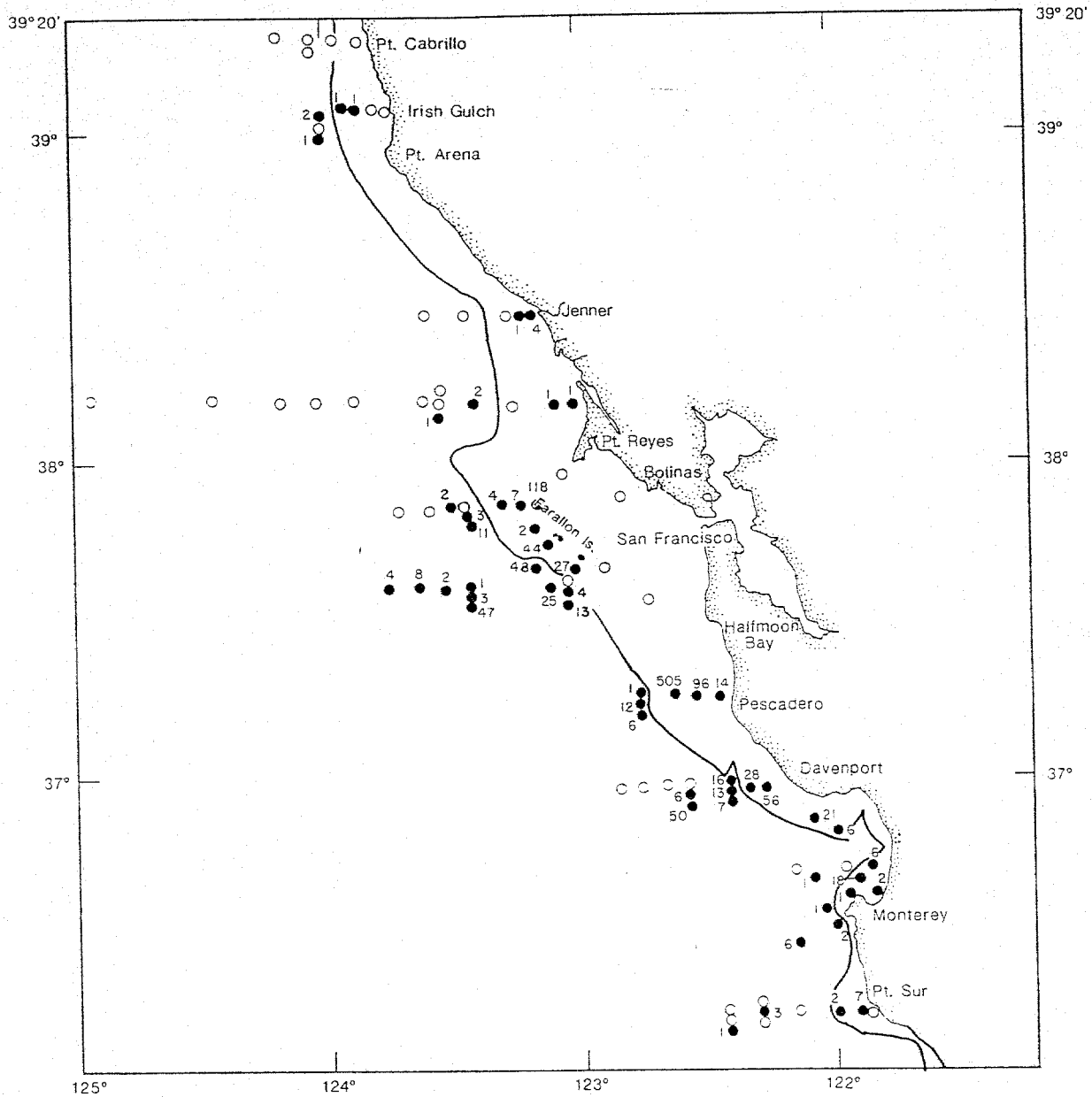


Figure 7. Abundance and distribution of juvenile Sebastes caught by mid-water trawl off central California in 1985. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

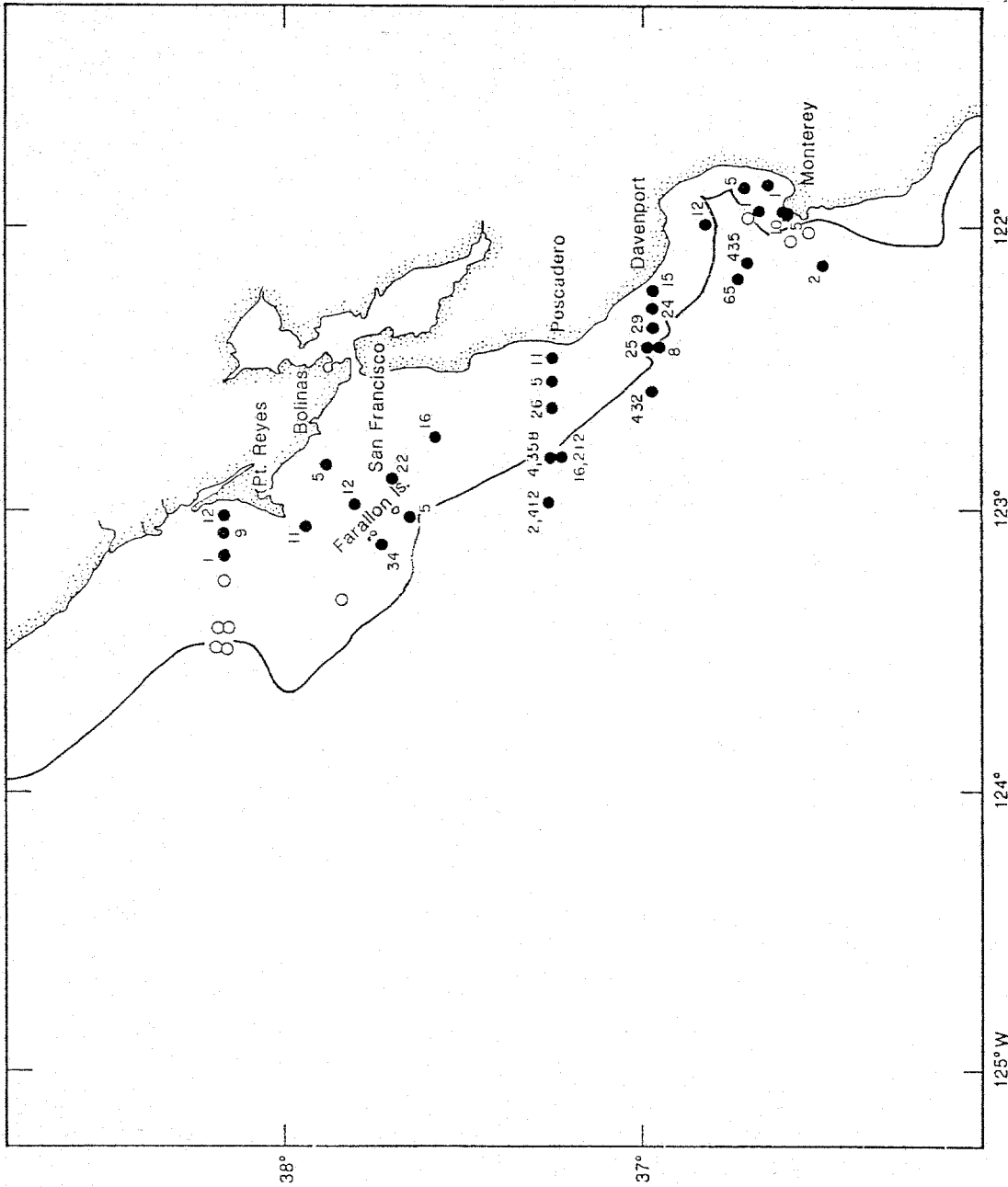


Figure 8. Abundance and distribution of juvenile Sebastes caught by mid-water trawl off central California during sweep 1 of 1986. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

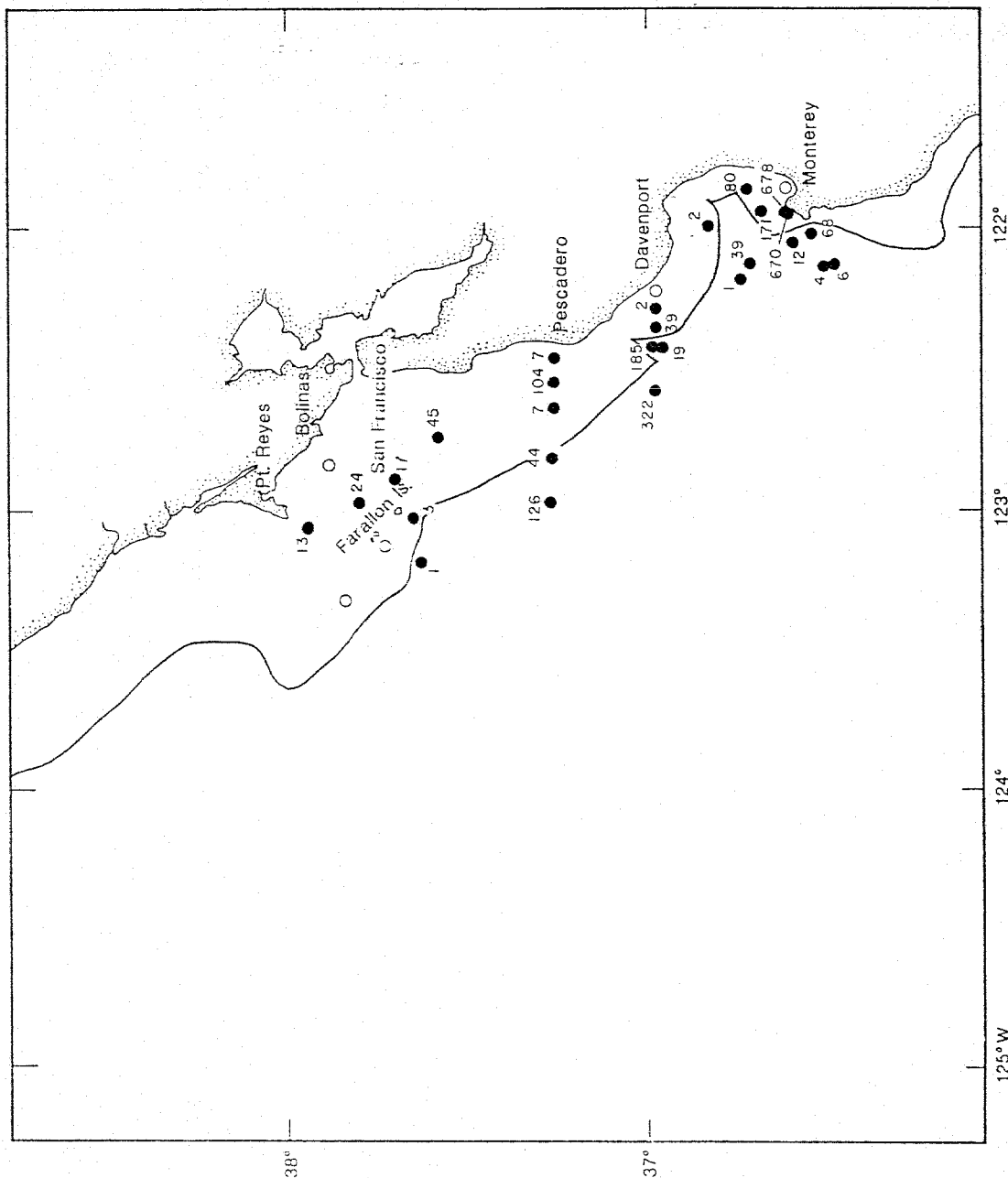


Figure 9. Abundance and distribution of juvenile *Sebastes* caught by mid-water trawl off central California during sweep 2 of 1986. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

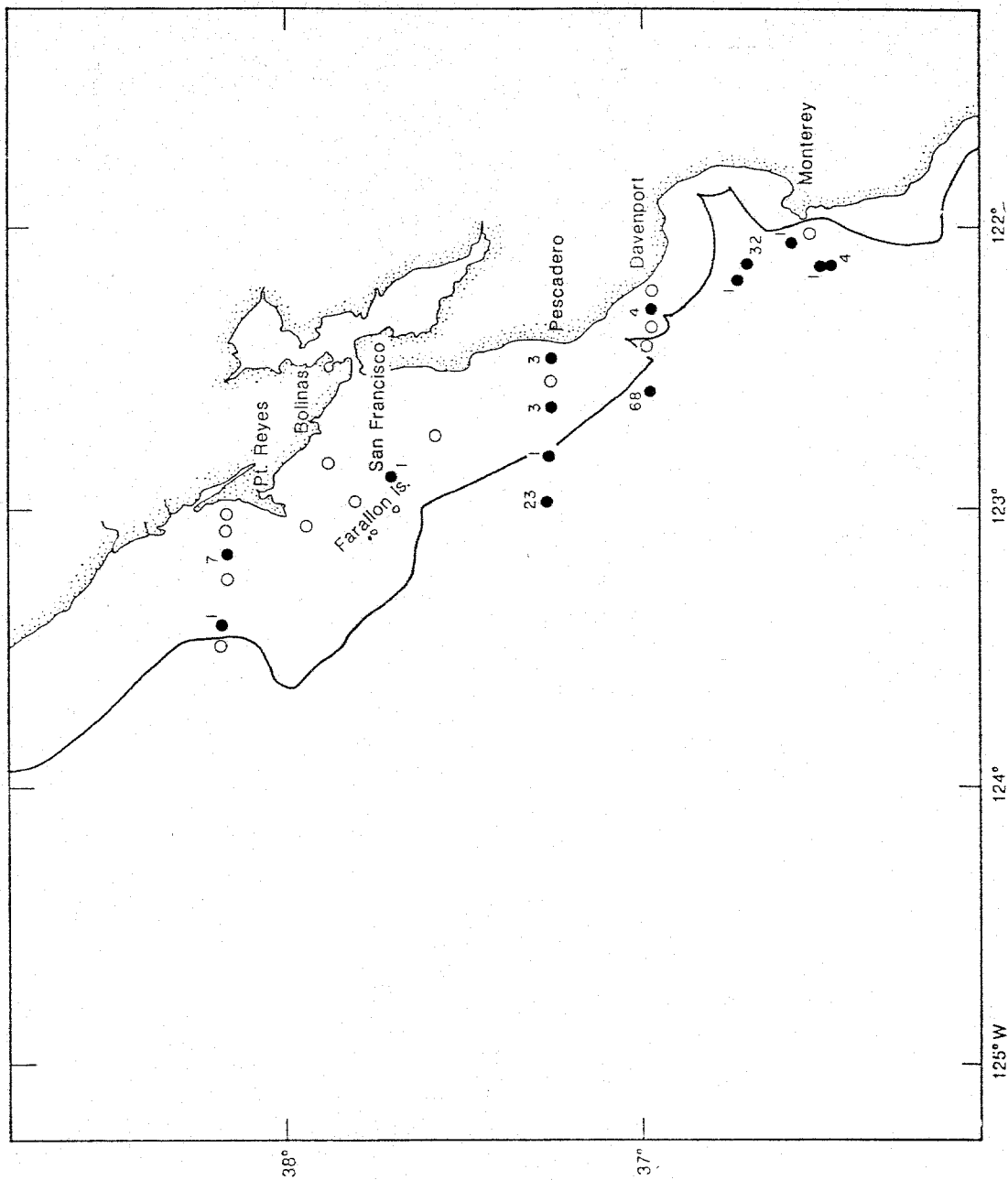


Figure 10. Abundance and distribution of juvenile Sebastes caught by mid-water trawl off central California during sweep 3 of 1986. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

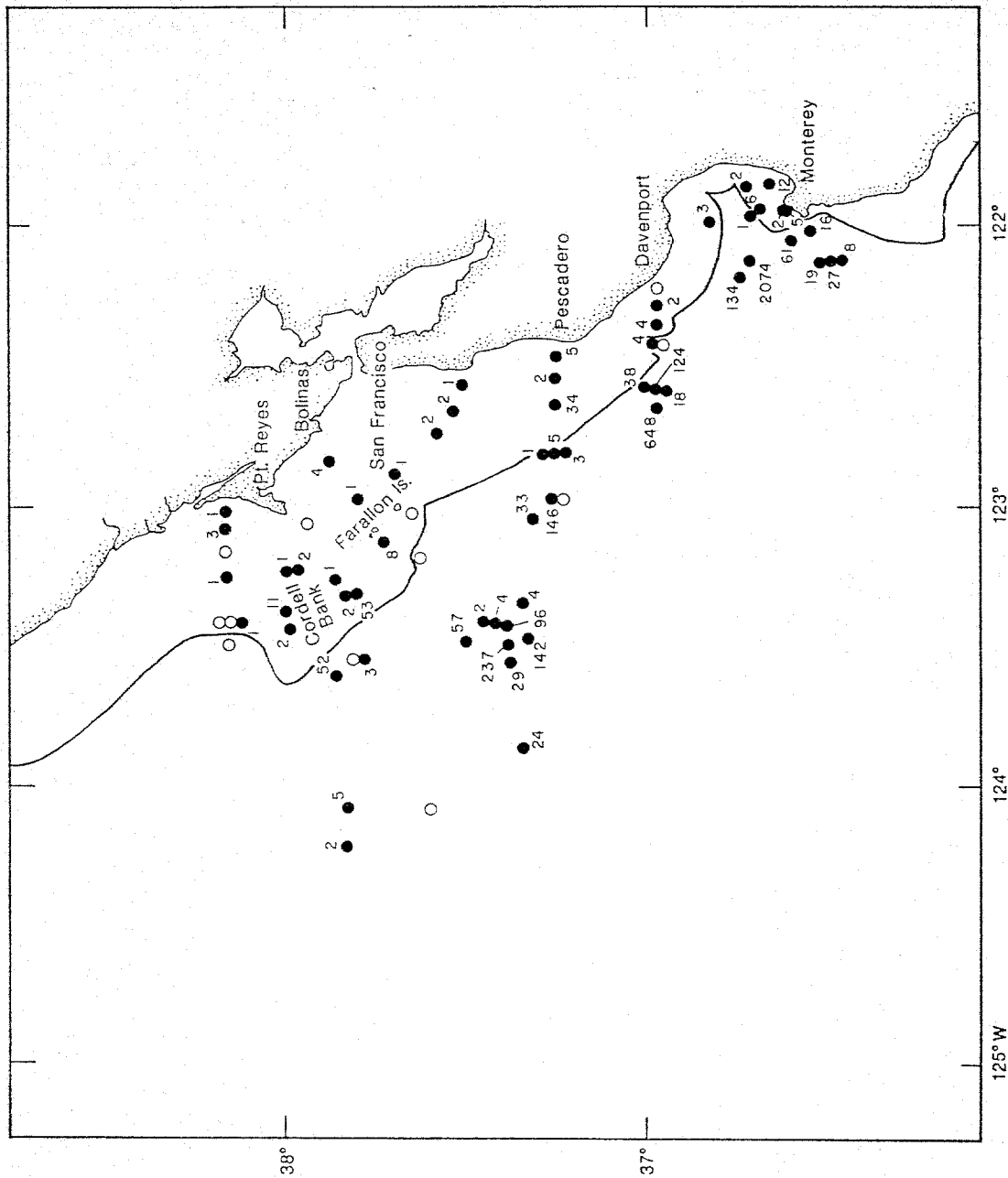


Figure 11. Abundance and distribution of juvenile *Sebastes* caught by mid-water trawl off central California in April 1987. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

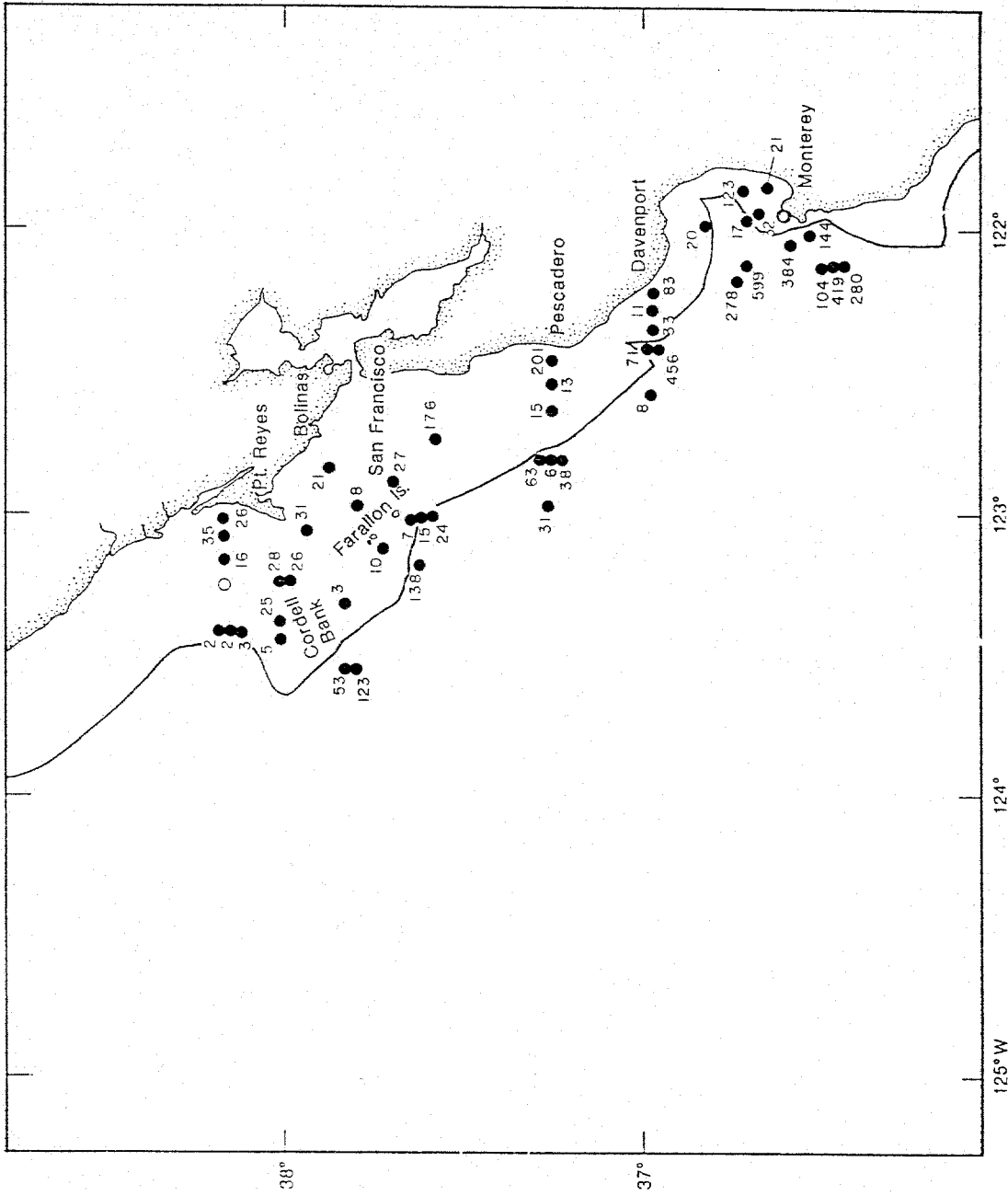


Figure 12. Abundance and distribution of juvenile *Sebastes* caught by mid-water trawl off central California in sweep 1 of May-June 1987. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

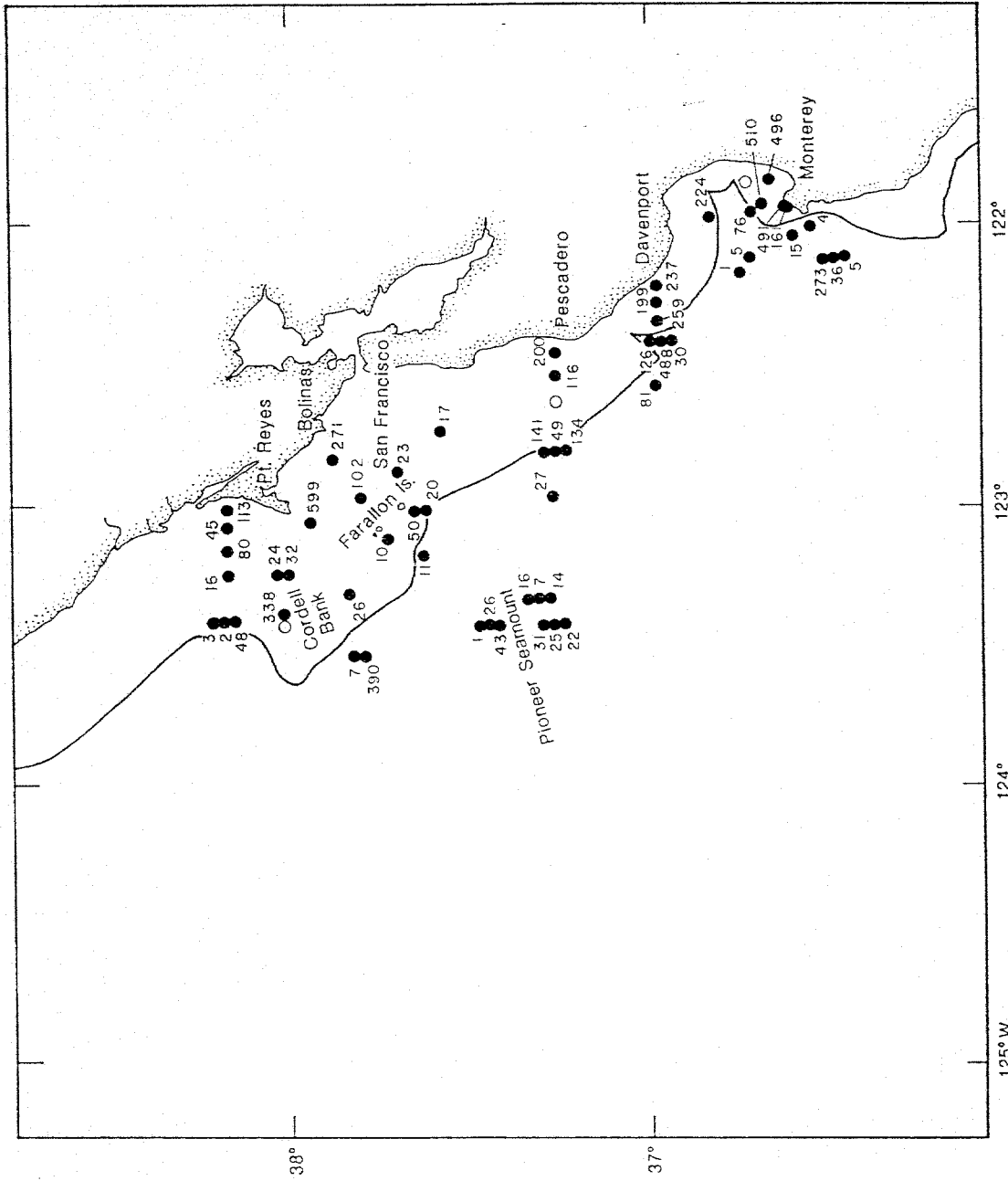


Figure 13. Abundance and distribution of juvenile *Sebastes* caught by mid-water trawl off central California in sweep 2 of May-June 1987. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

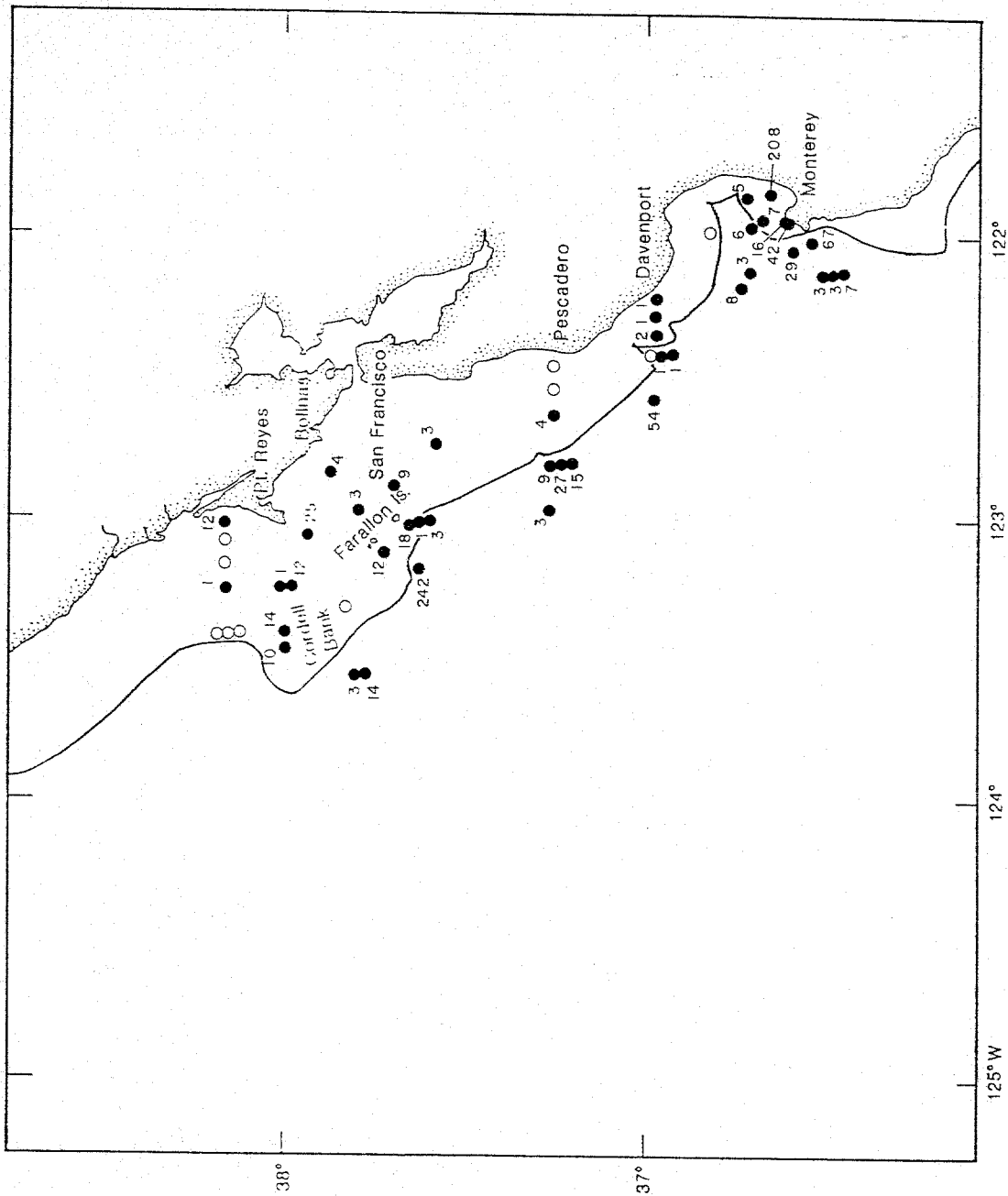


Figure 14. Abundance and distribution of juvenile *Sebastes* caught by mid-water trawl off central California in sweep 3 of May-June 1987. Open circles represent locations that were sampled but juvenile rockfish were not caught. Solid circles represent locations with positive samples of juvenile rockfish. The number adjacent to a solid circle represents the catch of juvenile rockfish.

Table 1. List of organisms identified during the juvenile rockfish surveys of 1983-1987.

Common Name	Scientific Name
Amphipod, Hyperiid	Hyperiidea
Amphipod	Amphipoda
Anchovy, northern, adult	<u>Engraulis mordax</u>
Anchovy, northern, juvenile	<u>Engraulis mordax</u>
Anenome, sea	Actinaria
Anthozoan	Anthozoa
Argentine, Pacific, adult	<u>Argentina sialis</u>
Argentine, Pacific, juvenile	<u>Argentina sialis</u>
Arrow worm	Chaetognatha
Barracudina, slender	<u>Lestidium ringens</u>
Barnacle, adult	Cirripedia
Barnacle, larva	Cirripedia
Barnacle, nauplii	Cirripedia
Bigscale	Melamphaidae
Bivalve veliger larva	Mollusca
Blackdragon	Idiacanthidae
Blacksmelt, deepsea	Bathylagidae
Blacksmelt, Pacific	<u>Bathylagus pacificus</u>
Blacksmelt, popeye	<u>Bathylagus ochotensis</u>
Blacksmelt, snubnose	<u>Bathylagus wesethi</u>
Bocaccio, adult	<u>Sebastes paucispinis</u>
Bocaccio, juvenile	<u>Sebastes paucispinis</u>
Brachiopod	Brachiopod
Bristlemouth, benttooth	<u>Cyclothone acclinidens</u>
Brittle star	Ophiuroidea
Butterfish	<u>Peprilus simillimus</u>
By the wind sailer	<u>Velella velella</u>
Cabazon	<u>Scorpaenichthys marmoratus</u>
Cephalopod	Cephalopoda
Chilipepper, adult	<u>Sebastes goodei</u>
Chilipepper, juvenile	<u>Sebastes goodei</u>
Clams	Bivalves
Combfish	Zaniolepididae
Combfish, longspine	<u>Zaniolepis latipinnis</u>
Combjelly	Ctenophore
Combjelly	<u>Pleurobrachia bachei</u>
Common mola	<u>Mola mola</u>
Copepod, adult	Copepoda
Copepod, juvenile	Copepoda
Copepod	<u>Neocalanus cristatus</u>
Copepod	<u>Calanus pacificus</u>
Copepod	<u>Calanidae</u> sp.
Copepod	<u>Candacia</u> sp.
Copepod	<u>Epilapidocera amphitrites</u>
Copepod	<u>Eucalanus</u> sp.
Copepod	<u>Eucalanus californicus</u>
Copepod	<u>Euchaeta</u> sp.

Table 1. Continued.

Common Name	Scientific Name
Copepod	<u>Euchirella</u> sp.
Copepod	<u>Metridia</u> sp.
Copepod	<u>Metridia pacifica</u>
Copepod	Pontellidae sp.
Corolla, spectacular	<u>Corolla spectabilis</u>
Cowcod, juvenile	<u>Sebastes levis</u>
Crab, anomuran zoea	Anomura
Crab, brachyuran larva	Brachyura
Crab, brachyuran megalopa	Brachyura
Crab, hermit	Paguridae sp.
Crab, pea zoea	Pinnotherid
Crab, pelagic red	<u>Pleuroncodes planipes</u>
Crab, porcellan zoea	Porcellanid
Crab, rock juvenile	<u>Cancer</u> sp.
Crab, rock megalopa	<u>Cancer</u> sp.
Crab, rock zoea	<u>Cancer</u> sp.
Crab, sand zoea	<u>Emerita</u> sp.
Crab, shore zoea	Grapsidae
Croaker, white	<u>Genyonemus lineatus</u>
Cumacean	Cumacean
Cusk-eel, basketweave	<u>Ophidion scrippsi</u>
Cusk-eel, spotted	<u>Chilara taylori</u>
Dog fish, spiny	<u>Squalus acanthias</u>
Dragonfish, highfin	<u>Bathophilus flemingi</u>
Dragonfish, longfin	<u>Tactostoma macropus</u>
Dragonfish, scaleless	Melanostomiidae
Eel, leptocephalus larva	Anguilliformes
Eelpout	Zoarcidae
Eelpout, bigfin	<u>Lycodes cortezianus</u>
Eelpout, flatcheek	<u>Lycenchelys crotalina</u>
Eelpout, pallid	<u>Lycodapus mandibularis</u>
Eelpout, soft	<u>Bothrocara molle</u>
Eggs, unidentified	Ova
Eulachon	<u>Thaleichthys pacificus</u>
Euphausiid	Euphausiacea sp.
Euphausiid	<u>Euphausia pacifica</u>
Euphausiid	<u>Nematoscelis difficilis</u>
Euphausiid	<u>Nyctiphanes simplex</u>
Euphausiid	<u>Thysanoessa spinifera</u>
Euphausiid, calyptopis	Euphausiidae sp.
Euphausiid, furcilia	Euphausiidae sp.
Euphausiid, juvenile	Euphausiidae sp.
Fish	Osteichthyes sp.
Fish, juvenile	Osteichthyes sp.
Fish, larva	Osteichthyes sp.
Flashlightfish	<u>Protomyctophum crockeri</u>

Table 1. Continued.

Common Name	Scientific Name
Flatfish	Pleuronectiformes
Flatfish, juvenile	Pleuronectiformes
Flatfish, larva	Pleuronectiformes
Flounder, starry, adult	<u>Platichthys stellatus</u>
Flounder, starry, juvenile	<u>Platichthys stellatus</u>
Gammarid amphipod	Gammaridea
Gastropod	Gastropoda
Gastropod, larva	Gastropoda
Goby, blackeye	<u>Coryphopterus nicholsii</u>
Goby, bluebanded, juvenile	<u>Lythrypnus dalli</u>
Greenling, juvenile	Hexagrammidae
Greenling, kelp, juvenile	<u>Hexagrammos decagrammus</u>
Greenling, painted, juvenile	<u>Oxylebius pictus</u>
Hagfish, Pacific	<u>Eptatretus stoutii</u>
Hake, Pacific, adult	<u>Merluccius productus</u>
Hake, Pacific, juvenile	<u>Merluccius productus</u>
Halfmoon, juvenile	<u>Medialuna californiensis</u>
Hatchetfish	Sternoptychidae
Headlightfish, California	<u>Diaphus theta</u>
Herring, Pacific	<u>Clupea pallasii</u>
Heteropod	<u>Carinaria</u> sp.
Heteropod	<u>Carinaria cristata</u>
Hydromedusa	Hydrozoa
Hyperiid, amphipod juvenile	Hyperiidea
Hyperiid, amphipod	<u>Dairella</u> sp.
Hyperiid, amphipod	<u>Hyperoche</u> sp.
Hyperiid, amphipod	<u>Phronima sedentaria</u>
Hyperiid, amphipod	<u>Phronima</u> sp.
Hyperiid, amphipod	<u>Symprone</u> sp.
Hyperiid, amphipod	<u>Vibilia</u> sp.
Jacksmelt	<u>Atherinopsis californiensis</u>
Jellyfish, purple	<u>Pelagia noctiluca</u>
Jellyfish	Scyphozoa
King-of-the-salmon	<u>Trachipterus altivelis</u>
Lampfish, northern	<u>Stenobranchius leucopsarus</u>
Lamprey	Petromyzontidae
Lanternfish	Myctophidae
Lanternfish, blue	<u>Tarletonbeania crenularis</u>
Lightfish	Gonostomatid
Lingcod, adult	<u>Ophiodon elongatus</u>
Lingcod, juvenile	<u>Ophiodon elongatus</u>
Lizardfish, California	<u>Synodus lucioceps</u>
Loosejaw	Malacosteidae
Lord, red Irish juvenile	<u>Hemilepidotus hemilepidotus</u>
Mackerel, jack	<u>Trachurus symmetricus</u>
Mackerel, chub	<u>Scomber japonicus</u>
Medusafish	<u>Icichthys lockingtoni</u>
Midshipman, plainfin	<u>Porichthys notatus</u>

Table 1. Continued.

Common Name	Scientific Name
Mysid	<u>Gnathophausia gigas</u>
Mysid	Mysidacea
Nudibranch	Nudibranchia
Octopus	Octopoda
Phoronid	Phoronidae
Pipefish	Syngnathidae
Poacher	Agonidae
Poacher, pygmy	<u>Odontopyxis trispinosa</u>
Polychaeta	<u>Tomopteris</u> sp
Polychaeta, larva	Polychaeta
Polychaeta, sedentary	Polychaeta
Pompano, gafftopsail	<u>Trachinotus rhodopus</u>
Pompano, Pacific	<u>Peprilus simillimus</u>
Ragfish	<u>Icosteus aenigmaticus</u>
Ratfish, spotted	<u>Hydrolagus colliei</u>
Ray, Pacific electric	<u>Torpedo californica</u>
Reptantian, zoea	Reptantia
Ribbon worm	Nemertea
Rockfish, juvenile	<u>Sebastes</u> sp.
Rockfish, larva	<u>Sebastes</u> sp.
Rockfish, bank, juvenile	<u>Sebastes rufus</u>
Rockfish, black, adult	<u>Sebastes melanops</u>
Rockfish, black, juvenile	<u>Sebastes melanops</u>
Rockfish, blue, adult	<u>Sebastes mystinus</u>
Rockfish, blue, juvenile	<u>Sebastes mystinus</u>
Rockfish, brown, adult	<u>Sebastes auriculatus</u>
Rockfish, brown, juvenile	<u>Sebastes auriculatus</u>
Rockfish, canary, adult	<u>Sebastes pinniger</u>
Rockfish, canary, juvenile	<u>Sebastes pinniger</u>
Rockfish, china, juvenile	<u>Sebastes nebulosus</u>
Rockfish, copper complex juvenile	<u>Sebastes</u> sp. (caurinus complex)
Rockfish, copper, adult	<u>Sebastes caurinus</u>
Rockfish, copper, juvenile	<u>Sebastes caurinus</u>
Rockfish, darkblotched, juvenile	<u>Sebastes cramerii</u>
Rockfish, grass, juvenile	<u>Sebastes rastelliger</u>
Rockfish, greenstriped, adult	<u>Sebastes elongatus</u>
Rockfish, greenstriped, juvenile	<u>Sebastes elongatus</u>
Rockfish, halfbanded, juvenile	<u>Sebastes semicinctus</u>
Rockfish, honeycomb, juvenile	<u>Sebastes umbrosus</u>
Rockfish, olive, adult	<u>Sebastes serranoides</u>
Rockfish, olive, juvenile	<u>Sebastes serranoides</u>
Rockfish, pygmy, juvenile	<u>Sebastes wilsoni</u>
Rockfish, quillback, adult	<u>Sebastes maliger</u>
Rockfish, quillback, juvenile	<u>Sebastes maliger</u>
Rockfish, redbanded, juvenile	<u>Sebastes babcocki</u>
Rockfish, rosy complex	<u>Sebastes</u> (subgenus <u>Sebastomus</u>)
Rockfish, rosy	<u>Sebastes rosaceus</u>
Rockfish, sharpchin, juvenile	<u>Sebastes zacentrus</u>
Rockfish, shortbelly, adult	<u>Sebastes jordani</u>

Table 1. Continued.

Common Name	Scientific Name
Rockfish, shortbelly, juvenile	<u>Sebastes jordani</u>
Rockfish, splitnose, juvenile	<u>Sebastes diploproa</u>
Rockfish, squarespot, juvenile	<u>Sebastes hopkinsi</u>
Rockfish, starry	<u>Sebastes constellatus</u>
Rockfish, stripetail, adult	<u>Sebastes saxicola</u>
Rockfish, stripetail, juvenile	<u>Sebastes saxicola</u>
Rockfish, tiger, juvenile	<u>Sebastes nigrocinctus</u>
Rockfish, widow, adult	<u>Sebastes entomelas</u>
Rockfish, widow	<u>Sebastes entomelas</u>
Rockfish, yelloweye, adult	<u>Sebastes ruberrimus</u>
Rockfish, yelloweye, juvenile	<u>Sebastes ruberrimus</u>
Rockfish, yellowtail, adult	<u>Sebastes flavidus</u>
Rockfish, yellowtail, juvenile	<u>Sebastes flavidus</u>
Sablefish, juvenile	<u>Anoplopoma fimbria</u>
Salmon, chinook	<u>Oncorhynchus tshawytscha</u>
Salmon, coho	<u>Oncorhynchus kisutch</u>
Salp	Larvacea
Salp	<u>Pyrosoma</u> sp
Salp	<u>Salpa</u> sp.
Salp	Thalacia
Sand dollar	Scurellina
Sanddab, juvenile	<u>Citharichthys</u> sp.
Sanddab, Pacific, adult	<u>Citharichthys sordidus</u>
Sanddab, Pacific, juvenile	<u>Citharichthys sordidus</u>
Sanddab, speckled, adult	<u>Citharichthys stigmaeus</u>
Sanddab, speckled, juvenile	<u>Citharichthys stigmaeus</u>
Sardine, Pacific	<u>Sardinops sagax</u>
Saury, Pacific	<u>Cololabis saira</u>
Sculpin, juvenile	Cottidae
Sea butterfly	Thecostomata
Sea cucumber	Holotheroidea
Sea mouse	Aphroditidae sp.
Sea stars	Asteroidea
Seaperch, pink	<u>Zalambius rosaceus</u>
Seaperch, shiner	<u>Cymatogaster aggregata</u>
Shark	Elasmobranchii
Shark, blue	<u>Prionace glauca</u>
Shrimp, Caridean	Caridean
Shrimp, juvenile	Natantia
Shrimp, larva	Natantia
Shrimp, ocean	<u>Pandalus jordani</u>
Shrimp, Pasiphaeid	<u>Pasiphaea pacifica</u>
Shrimp, spotted bay	<u>Crangon nigromaculata</u>
Shrimp, Sergestid	Sergestidae
Shrimp, Sergestid	<u>Sergestes similis</u>
Siphonophore	Calycophoran siphonophore
Siphonophore	<u>Muggiaea atlantica</u>
Siphonophore	Siphonophore
Skate	Rajidae

Table 1. Continued.

Common Name	Scientific Name
Skate case	Rajidae
Skate, big	<u>Raja binocolata</u>
Skate, longnose	<u>Raja rhina</u>
Skate, Bering	<u>Bathyraja interrupta</u>
Skate, starry	<u>Raja stellulata</u>
Smelt	Osmeridae
Smelt, deepsea	Bathylagidae
Smelt, longfin	<u>Spirinchus thaleichthys</u>
Smelt, night	<u>Spirinchus starksi</u>
Smelt, whitebait	<u>Allosmerus elongatus</u>
Smoothound, grey	<u>Mustelus californicus</u>
Smoothtongue, California	<u>Leuroglossus stilbius</u>
Snailfish	Cyclopteridae
Snailfish, slipskin	<u>Liparus fucensis</u>
Snipe eel, slender	<u>Nemichthys scolopaceus</u>
Sole, curlfin adult	<u>Pleuronichthys decurrens</u>
Sole, curlfin juvenile	<u>Pleuronichthys decurrens</u>
Sole, Dover, adult	<u>Microstomus pacificus</u>
Sole, Dover, juvenile	<u>Microstomus pacificus</u>
Sole, English, adult	<u>Pleuronectes vetulus</u>
Sole, Petrale, adult	<u>Eopsetta jordani</u>
Sole, Petrale, juvenile	<u>Eopsetta jordani</u>
Sole, rex, adult	<u>Errex zachirus</u>
Sole, rex, juvenile	<u>Errex zachirus</u>
Sole, sand, adult	<u>Psettichthys melanostictus</u>
Sole, slender, adult	<u>Eopsetta exilis</u>
Sole, slender, juvenile	<u>Eopsetta exilis</u>
Sponge	Porifera
Squaretail, smalleye	<u>Tetragonurus cuvieri</u>
Squid	Teuthoidea
Squid, California market	<u>Loligo opalescens</u>
Stickleback, threespine	<u>Gasterosteus aculeatus</u>
Stingray	Dasyatididae
Thornyhead, shortspined	<u>Sebastolobus alascanus</u>
Tomcod, Pacific, juvenile	<u>Microgadus proximus</u>
Tonguefish, California	<u>Symphurus atricauda</u>
Treefish, juvenile	<u>Sebastes serriceps</u>
Turbot, juvenile	<u>Pleuronichthys sp.</u>
Turbot, hornyhead, adult	<u>Pleuronichthys verticalis</u>
Turbot, hornyhead, juvenile	<u>Pleuronichthys verticalis</u>
Turbot, spotted, adult	<u>Pleuronichthys ritteri</u>
Turbot, spotted, juvenile	<u>Pleuronichthys ritteri</u>
Viperfish, Pacific	<u>Chauliodus macouni</u>
Wolf-eel, juvenile	<u>Anarrhichthys ocellatus</u>
Worm, sipunculid	Sipunculida

Table 2. Summary of mid-water trawl catches off Pt. Reyes in 1983.

Station	165	166	167	167	169
Month/day	6/22	6/22	6/8	6/23	6/23
Starting time	0235	0346	1745	0441	0258
Gear depth (m)	10	30	30	30	30
Bottom depth (m)	60	86	102	102	174
Age 0 fishes					
Rockfish					
Bocaccio					
Brown					
Canary					
Chilipepper					
Yellowtail				1	
Shortbelly					
Widow					
Other rockfish					
Total rockfish	-	-	-	1	-
Flatfish					
Dover sole					
Rex sole					
Sanddabs	1	2		4	
Other flatfish					1
Total flatfish	1	2	-	4	1
Pacific hake		3		37	
Lingcod					
Sablefish					
Other fish					
Total age 0 fishes	1	5	-	42	1
Adult fishes					
Pacific hake					
Northern anchovy		1			
Pacific herring		1			
Myctophids					
Midshipmen					
Invertebrates					
Ctenophores	1000	1000		10	40
Euphausiids		100		200	100
Squid					
Salps		5		3	31

Table 3. Summary of mid-water trawl catches outside Pt. Reyes in 1983.

Station	171	172	173	174
Month/day	6/23	6/23	6/22	6/22
Starting time	0213	0000	2239	2116
Gear depth (m)	30	30	30	30
Bottom depth (m)	500	644	1460	2180
Age 0 fishes				
Rockfish				
Bocaccio				
Brown				
Canary				
Chilipepper				
Yellowtail				
Shortbelly				
Widow				
Other rockfish				
Total rockfish	-	-	-	-
Flatfish				
Dover sole				1
Rex sole				2
Sanddabs				
Other flatfish			1	
Total flatfish	-	-	1	3
Pacific hake				7
Lingcod				
Sablefish				
Other fish				
Total age 0 fishes	-	-	1	10
Adult fishes				
Pacific hake				
Northern anchovy				
Pacific herring				
Myctophids			15	43
Midshipmen				
Invertebrates				
Ctenophores	200	2020	1000	
Euphausiids			1000	1000
Squid				
Salps	1020	1077	1057	1001

Table 4. Summary of mid-water trawl catches off the Farallon Islands in 1983.

Station	152	144	156	157
Month/day	6/18	6/18	6/18	6/17
Starting time	0257	0407	0130	2114
Gear depth (m)	30	30	30	30
Bottom depth (m)	106	420	74	82
Age 0 fishes				
Rockfish				
Bocaccio				
Brown				
Canary				
Chilipepper				
Yellowtail			7	
Shortbelly		25	3	1
Widow			4	
Other rockfish	1			
Total rockfish	1	25	14	1
Flatfish				
Dover sole				
Rex sole	1			1
Sanddabs	1			
Other flatfish				
Total flatfish	2	-	-	1
Pacific hake		1		
Lingcod				
Sablefish				
Other fish				
Total age 0 fishes	3	26	14	2
Adult fishes				
Pacific hake				
Northern anchovy				
Pacific herring				
Myctophids				
Midshipmen				
Invertebrates				
Ctenophores	100	1000	10	40
Euphausiids	3	1000	200	50
Squid				
Salps	3	1	21	2

Table 5. Summary of mid-water trawl catches off Pescadero in 1983.

Station	130	131	132	132	132
Month/day	6/15	6/15	6/16	6/15	6/16
Starting time	2120	2243	0432	2347	0325
Gear depth (m)	10	10	10	30	50
Bottom depth (m)	56	96	110	110	110
Age 0 fishes					
Rockfish					
Bocaccio					
Brown					
Canary					
Chilipepper					
Yellowtail					
Shortbelly					
Widow					
Other rockfish					
Total rockfish	-	-	-	-	-
Flatfish					
Dover sole					
Rex sole					
Sanddabs					
Other flatfish					
Total flatfish	-	-	-	-	-
Pacific hake			1	1	3
Lingcod					
Sablefish					
Other fish					
Total age 0 fishes	-	-	1	1	3
Adult fishes					
Pacific hake					
Northern anchovy		6	36	65	3
Pacific herring					
Myctophids					
Midshipmen				1	
Invertebrates					
Ctenophores			5	20	40
Euphausiids					
Squid	7	10	9	14	1
Salps	4	7	8	46	12

Table 6. Summary of mid-water trawl catches off Davenport in 1983.

Station	122	123	124	125	125
Month/day	6/14	6/14	6/15	6/15	6/15
Starting time	2150	2330	0021	0121	0222
Net depth (m)	30	30	30	30	100
Bottom depth (m)	52	90	132	324	162
Age 0 fishes					
Rockfish					
Bocaccio					
Brown					
Canary					
Chilipepper					
Yellowtail					
Shortbelly					
Widow					
Other rockfish					
Total rockfish	-	-	-	-	-
Flatfish					
Dover sole					
Rex sole					
Sanddabs	49		2		
Other flatfish		1			
Total flatfish	49	1	2	-	-
Pacific hake	4				1
Lingcod					
Sablefish					
Other fish					
Total age 0 fishes	53	1	2	-	1
Adult fishes					
Pacific hake					
Northern anchovy	516	450			
Pacific herring	200				
Myctophids					
Midshipmen	3	13	3	2	2
Invertebrates					
Ctenophores			15	10	10
Euphausiids			15	20	30
Squid	1	112			
Salps		2	6	31	145

Table 7. Summary of mid-water trawl catches inside Monterey Bay in 1983.

Station	114	115	116	119	120	121
Month/day	6/13	6/12	6/13	6/12	6/12	6/13
Starting time	0143	1949	0252	2211	2344	2225
Gear depth (m)	30	30	30	30	10	30
Bottom depth (m)	90	102	650	88	28	76
Age 0 fishes						
Rockfish						
Bocaccio						
Brown						
Canary						
Chilipepper						
Yellowtail						
Shortbelly			1			
Widow						
Other rockfish						
Total rockfish	-	-	1	-	-	-
Flatfish						
Dover sole						
Rex sole						
Sanddabs						4
Other flatfish						
Total flatfish	-	-	-	-	-	4
Pacific hake	20			1	1	1
Lingcod						
Sablefish						
Other fish						
Total age 0 fishes	20	-	1	1	1	5
Adult fishes						
Pacific hake						
Northern anchovy	40		14	268		260
Pacific herring				1	9	2
Myctophids	71		75			
Midshipmen	3					
Invertebrates						
Ctenophores						
Euphausiids	1200		93			
Squid	5			52		
Salps	1			35		

Table 8. Summary of mid-water trawl catches outside Monterey Bay in 1983.

Station	109	113	118	118	117
Month/day	6/12	6/14	6/14	6/14	6/14
Starting time	1748	0436	0139	0028	0307
Gear depth (m)	30	30	30	100	30
Bottom depth (m)	1150	1200	900	920	2000
Age 0 fishes					
Rockfish					
Bocaccio					
Brown					
Canary					
Chilipepper					
Yellowtail					
Shortbelly		2	2		
Widow					
Other rockfish					1
Total rockfish	-	2	2	-	1
Flatfish					
Dover sole					
Rex sole					
Sanddabs					
Other flatfish					
Total flatfish	-	-	-	-	-
Pacific hake		1			
Lingcod					
Sablefish				1	
Other fish					
Total age 0 fishes	-	3	2	1	1
Adult fishes					
Pacific hake					
Northern anchovy					
Pacific herring					
Myctophids		110	1		22
Midshipmen					
Invertebrates					
Ctenophores		50	150	30	10
Euphausiids		10006	5000		10000
Squid				2	
Salps		1	200		50

Table 9. Summary of mid-water trawl catches off Pt. Sur in 1983.

Station	101	102	104
Month/day	6/10	6/10	6/10
Starting time	2008	2111	2249
Gear depth (m)	30	30	30
Bottom depth (m)	72	80	480

Age 0 fishes

Rockfish

Bocaccio			
Brown			
Canary			
Chilipepper			
Yellowtail			
Shortbelly			56
Widow			
Other rockfish			

Total rockfish	-	-	56
----------------	---	---	----

Flatfish

Dover sole			
Rex sole			
Sanddabs			
Other flatfish			

Total flatfish	-	-	-
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Pacific hake			
Lingcod			
Sablefish			
Other fish			

Total age 0 fishes	-	-	56
--------------------	---	---	----

Adult fishes

Pacific hake			
Northern anchovy		1	
Pacific herring			
Myctophids		522	
Midshipmen			

Invertebrates

Ctenophores			
Euphausiids			
Squid			
Salps			

Table 10. Summary of mid-water trawl catches off Jenner in 1984.

Station	182	183	184
Month/day	6/25	6/25	6/25
Starting time	0215	0307	0345
Gear depth (m)	10	10	10
Bottom depth (m)	30	60	80
Age 0 fishes			
Rockfish			
Bocaccio	1		
Brown	4	2	
Canary	4		1
Chilipepper			
Yellowtail	30		
Shortbelly	28	3	3
Widow	6	1	
Other rockfish	4		
Total rockfish	<hr/> 77	<hr/> 6	<hr/> 4
Flatfish			
Dover sole		2	
Rex sole			
Sanddabs			
Other flatfish			
Total flatfish		<hr/> 2	
Pacific hake			25
Lingcod	111	17	
Sablefish			
Other fish			
Total age 0 fishes	<hr/> 188	<hr/> 25	<hr/> 29
Adult fishes			
Pacific hake	58	29	18
Northern anchovy	11		
Pacific herring			
Myctophids			
Midshipmen			
Invertebrates			
Ctenophores	200	200	
Euphausiids	57600	800	9600
Squid	20	1	
Salps			

Table 11. Summary of mid-water trawl catches off Pt. Reyes in 1984.

Station	165	166	167	169	171	171	172	173	174	175
Month/day	6/24	6/24	6/24	6/24	6/22	6/22	6/24	6/24	6/23	6/23
Starting time	2102	2215	2340	0330	2100	2203	0135	0008	2251	2104
Gear depth (m)	10	30	30	30	30	100	100	30	30	30
Bottom depth (m)	56	84	994	158	382	382	540	1150	2100	3700
Age 0 fishes										
Rockfishes										
Bocaccio										
Brown										
Canary										
								1		
Chilipepper										
Yellowtail	7		1	1				1		
Shortbelly	1	1				1	6	18	2	73
Widow				1						4
Other rockfish				1						3
Total rockfish	8	1	1	3	-	1	6	20	2	80
Flatfish										
Dover sole										
Rex sole										
Sanddabs										
							2			
Other flatfish										
Total flatfish	-	-	-	-	-	-	2	-	-	-
Pacific hake										
				13			19			
Lingcod										
Sablefish										
Other fish	17									
Total age 0 fishes	25	1	1	16	-	1	27	20	2	80
Adult fishes										
Pacific hake										
Northern anchovy										
Pacific herring	24									
Myctophids										
Midshipmen			17	1		50	72	2	6	13
Invertebrates										
Ctenophores	10000							20		200
Euphausiids		3200								
Squid	1	4		1		100	99	20	5	50
Salps										

Table 12. Summary of mid-water trawl catches in the Gulf of the Farallones in 1984.

Station	140	141	142	137	135
Month/day	6/27	6/27	6/27	6/26	6/26
Starting time	0510	0350	0025	2257	2100
Gear depth (m)	10	10	10	10	10
Bottom depth (m)	22	24	28	64	27
Age 0 fishes					
Rockfish					
Bocaccio				8	
Brown			7		
Canary				5	
Chilipepper				1	
Yellowtail			8	6	
Shortbelly			1	53	
Widow			1	10	
Other rockfish			4	3	
Total rockfish	-	-	21	86	-
Flatfish					
Dover sole					
Rex sole					
Sanddabs			2		
Other flatfish					
Total flatfish	-	-	2	-	-
Pacific hake			30		
Lingcod			5		
Sablefish					
Other fish				9	
Total age 0 fishes	-	-	58	95	-
Adult fishes					
Pacific hake		47		39	107
Northern anchovy	8500	30	208	9	1296
Pacific herring	578	1000	80		540
Myctophids			4	1	
Midshipmen					
Invertebrates					
Ctenophores				9200	10000
Euphausiids				27968	
Squid		20	3	4140	
Salps					

Table 13. Summary of mid-water trawl catches off the Farallon Islands in 1984.

Station	156	157	158	152	144	145
Month/day	6/22	6/22	6/25	6/22	6/21	6/21
Starting time	0251	0402	2104	0130	2253	0012
Gear depth (m)	30	10	30	30	30	30
Bottom depth (m)	70	72	100	106	182	1094
Age 0 fishes						
Rockfish						
Bocaccio					10	55
Brown				1	1	
Canary	3			11	14	
Chilipepper			1	3	3	
Yellowtail	1			6	6	6
Shortbelly	26	19	8	41	93	218
Widow	4	1	2	7	6	2
Other rockfish	2	1		5	14	3
Total rockfish	36	21	11	74	147	284
Flatfish						
Dover sole					3	
Rex sole						
Sanddabs				1		
Other flatfish						
Total flatfish	-	-	-	1	3	-
Pacific hake	1				98	160
Lingcod						
Sablefish						
Other fish						
Total age 0 fishes	37	21	11	75	248	444
Adult fishes						
Pacific hake	1	3	275	15	26	
Northern anchovy					1	
Pacific herring						
Myctophids			12			
Midshipmen	1				1	168
Invertebrates						
Ctenophores	500		200	100	200	200
Euphausiids		5000	100	300		
Squid		3	1		76	23
Salps						

Table 14. Summary of mid-water trawl catches off Pescadero in 1984.

Station	130	131	132	133	134
Month/day	6/17	6/17	6/17	6/16	6/16
Starting time	0345	0235	0125	2337	2203
Gear depth (m)	10	30	30	30	30
Bottom depth (m)	54	94	104	196	552
Age 0 fishes					
Rockfish					
Bocaccio			4	7	4
Brown	2		5		1
Canary	2				
Chilipepper	2		1		2
Yellowtail	2				
Shortbelly	34		28		28
Widow	4		1		
Other rockfish	1		5		
Total rockfish	47	-	44	7	35
Flatfish					
Dover sole					2
Rex sole					1
Sanddabs					
Other flatfish		3	14		3
Total flatfish		3	14		6
Pacific hake					
Lingcod					
Sablefish					
Other fish					3
Total age 0 fishes	47	3	58	7	44
Adult fishes					
Pacific hake		76	179	330	480
Northern anchovy	48		15	3	
Pacific herring					
Myctophids			69		
Midshipmen					67
Invertebrates					
Ctenophores	50	100		100	150
Euphausiids	30800	100		200	300
Squid	10			3	480
Salps					10

Table 15. Summary of mid-water trawl catches off Davenport in 1984.

Station	122	123	124	126	125	125	127
Month/day	6/12	6/12	6/12	6/13	6/13	6/13	6/13
Starting time	2110	2210	2311	0250	0005	0110	0401
Gear depth (m)	10	30	30	30	30	100	30
Bottom depth (m)	56	100	134	404	220	154	794
Age 0 fishes							
Rockfish							
Bocaccio		13	18		145	18	21
Brown	3	3	3		5		
Canary	4	5	6		19	13	
Chilipepper	8	6			11	2	
Yellowtail	18	5			22	33	
Shortbelly	67	3	23		163	246	
Widow	10	1	3		3	14	
Other rockfish		1	2		21	16	2
Total rockfish	110	37	55	-	389	342	23
Flatfish							
Dover sole			10				
Rex sole							
Sanddabs	2	6				3	
Other flatfish				1		1	
Total flatfish	2	6	10	1	-	4	-
Pacific hake		1	11		1		7755
Lingcod	11						
Sablefish					1		
Other fish		3			12	3	
Total age 0 fishes	123	47	76	1	403	349	7778
Adult fishes							
Pacific hake		349	3	25		22	
Northern anchovy	460	2765	2380	1	3920	2030	10
Pacific herring	4						
Myctophids		1					
Midshipmen				7			7
Invertebrates							
Ctenophores	100		200		200		100
Euphausiids	5		200	50	200		100
Squid	28	3		2			
Salps				10			

Table 16. Summary of mid-water trawl catches inside Monterey Bay in 1984.

Station	119	112	115	121
Month/day	6/13	6/14	6/14	6/13
Starting time	2202	0217	0050	2025
Gear depth (m)	30	30	30	30
Bottom depth (m)	98	94	106	78
Age 0 fishes				
Rockfish				
Bocaccio				2
Brown			1	2
Canary		4	1	
Chilipepper		13	3	
Yellowtail		1		
Shortbelly	2	59	6	1
Widow		1		
Other rockfish	1	4	2	
Total rockfish	3	82	13	5
Flatfish				
Dover sole			26	
Rex sole				
Sanddabs	8	1		2
Other flatfish				
Total flatfish	8	1	26	2
Pacific hake	1	1		1
Lingcod		2		
Sablefish		1		
Other fish				1
Total age 0 fishes	12	87	39	9
Adult fishes				
Pacific hake	79		2	
Northern anchovy				
Pacific herring	23	10	41	179
Myctophids	78			
Midshipmen				
Invertebrates				
Ctenophores			500	2000
Euphausiids		1000	2000	200
Squid	8	21	14	90
Salps				

Table 17. Summary of mid-water trawl catches outside Monterey Bay in 1984.

Station	109	113	116	117	110	110
Month/day	6/15	6/15	6/14	6/16	6/15	6/15
Starting time	2343	0042	0330	0145	2221	2111
Gear depth (m)	30	30	30	30	30	100
Bottom depth (m)	590	1030	562	2000	2400	2400
Age 0 fishes						
Rockfish						
Bocaccio	2	4			48	1
Brown			1	1		
Canary			1		1	1
Chilipepper			5		1	
Yellowtail						
Shortbelly			2	2	112	4
Widow					2	
Other rockfish	1		2	1	3	3
Total rockfish	3	4	11	4	167	9
Flatfish						
Dover sole				8		
Rex sole						
Sanddabs			19			
Other flatfish		1				
Total flatfish	-	1	19	8	-	-
Pacific hake						
Lingcod						
Sablefish						
Other fish						
Total age 0 fishes	3	5	30	12	167	9
Adult fishes						
Pacific hake	3040	9920		68	3000	154
Northern anchovy						
Pacific herring		2	28	4		
Myctophids						
Midshipmen	4		12	300	260	230
Invertebrates						
Ctenophores	100	100	100	1000	1125	128
Euphausiids		200	2000	2000	1000	
Squid	45	115	50	88	60	440
Salps				9		1

Table 18. Summary of mid-water trawl catches off Pt. Sur in 1984.

Station	101	102	103	103	105	106	106
Month/day	6/14	6/14	6/14	6/14	6/15	6/15	6/15
Starting time	2112	2150	2242	2327	0103	0230	0330
Gear depth (m)	10	10	10	30	30	30	100
Bottom depth (m)	66	78	112	112	906	984	1061
Age 0 fishes							
Rockfish							
Bocaccio	2	2	7	9		5	2
Brown				1			
Canary		2		2			
Chilipepper	1						
Yellowtail							
Shortbelly	5	44	4	86	1	7	
Widow				1			
Other rockfish		2		3		1	2
Total rockfish	8	50	11	102	1	13	4
Flatfish							
Dover sole		2		9	1	1	
Rex sole		1				1	
Sanddabs		12	4				2
Other flatfish			1				
Total flatfish	-	15	5	9	1	2	2
Pacific hake							
Lingcod							
Sablefish							
Other fish	1			5		3	
Total age 0 fishes	9	65	16	116	2	18	6
Adult fishes							
Pacific hake			2				
Northern anchovy							
Pacific herring	9	37		1		2	1
Myctophids							
Midshipmen					505	250	250
Invertebrates							
Ctenophores	20	50		100	500	200	
Euphausiids		50	1000	35200			
Squid	1	10	6	5	55	80	11
Salps			6	12	100	27	

Table 19. Summary of bottom trawl catches off Jenner in 1984.

Station	234	235	236	237
Month/day	6/25	6/25	6/25	6/25
Starting time	0835	0951	1111	1350
Gear depth (m)	62	77	102	148
Bottom depth (m)	62	77	107	148
Age 0 fishes				
Rockfish				
Bocaccio				
Brown				
Canary				
Chilipepper				
Yellowtail				
Shortbelly				
Widow				
Other rockfish	1			1
Total rockfish	1	-	-	1
Flatfish				
Dover sole	1	6		
Rex sole	1	10	10	
Sanddabs	28	74	30	
Other flatfish	8	5	10	
Total flatfish	38	95	50	-
Pacific hake				
Lingcod	3	1		
Sablefish				
Other fish	1	2		
Total age 0 fishes	43	98	50	1
Adult fishes				
Pacific hake				
Northern anchovy				
Pacific herring				
Myctophids				
Midshipmen	1		10	1
Invertebrates				
Ctenophores	20			
Euphausiids				
Squid				
Salps				

Table 20. Summary of bottom trawl catches off Pt. Reyes in 1984.

Station	230	231	232	233
Month/day	6/24	6/24	6/24	6/24
Starting time	0855	1019	1220	1415
Gear depth (m)	78	84	100	152
Bottom depth (m)	78	84	100	152
Age 0 fishes				
Rockfish				
Bocaccio				
Brown				
Canary				
Chilipepper				
Yellowtail				
Shortbelly				
Widow				
Other rockfish	1			2
Total rockfish	1	-	-	2
Flatfish				
Dover sole	8		28	
Rex sole	3			
Sanddabs	49	1	113	2
Other flatfish	38		70	7
Total flatfish	98	1	211	9
Pacific hake				3
Lingcod				
Sablefish				
Other fish	12			
Total age 0 fishes	111	1	211	14
Adult fishes				
Pacific hake			2	
Northern anchovy				
Pacific herring				
Myctophids				
Midshipmen			55	10
Invertebrates				
Ctenophores	750	20		
Euphausiids				
Squid				
Salps				

Table 21. Summary of bottom trawl catches in the Gulf of the Farallones in 1984.

Station	238	239	240
Month/day	6/26	6/26	6/26
Starting time	0833	1049	1320
Gear depth (m)	100	53	26
Bottom depth (m)	100	53	26
Age 0 fishes			
Rockfish			
Bocaccio			
Brown			
Canary			
Chilipepper			
Yellowtail			2
Shortbelly			
Widow			
Other rockfish	3		
Total rockfish	3	-	2
Flatfish			
Dover sole	8		
Rex sole	28	1	
Sanddabs	13		4
Other flatfish	3	1	28
Total flatfish	52	2	32
Pacific hake			
Lingcod			
Sablefish			
Other fish			11
Total age 0 fishes	55	2	45
Adult fishes			
Pacific hake	6		
Northern anchovy			
Pacific herring			
Myctophids			
Midshipmen	12		2
Invertebrates			
Ctenophores	1000	50	2000
Euphausiids			
Squid			
Salps			

Table 22. Summary of bottom trawl catches off Pescadero in 1984.

Station	227	228	229	255
Month/day	6/17	6/17	6/17	6/17
Starting time	0824	1010	1225	1425
Gear depth (m)	189	149	94	58
Bottom depth (m)	189	149	94	58
Age 0 fishes				
Rockfish				
Bocaccio				
Brown			1	
Canary				
Chilipepper				
Yellowtail				
Shortbelly				
Widow				
Other rockfish			16	5
Total rockfish	-	-	17	5
Flatfish				
Dover sole			100	
Rex sole				
Sanddabs	2		100	47
Other flatfish	2		200	77
Total flatfish	4	-	400	124
Pacific hake				
Lingcod				27
Sablefish				
Other fish			1	
Total age 0 fishes	4	-	418	156
Adult fishes				
Pacific hake				
Northern anchovy				
Pacific herring				
Myctophids				
Midshipmen				
Invertebrates				
Ctenophores		20		200
Euphausiids				
Squid				
Salps				

Table 23. Summary of bottom trawl catches off Davenport in 1984.

Station	214	215	216
Month/day	6/13	6/13	6/13
Starting time	0901	1035	1420
Gear depth (m)	308	204	130
Bottom depth (m)	308	204	130
Age 0 fishes			
Rockfish			
Bocaccio			
Brown			
Canary		1	
Chilipepper			
Yellowtail			
Shortbelly			
Widow			
Other rockfish		5	7
Total rockfish	-	6	7
Flatfish			
Dover sole			30
Rex sole			30
Sanddabs	4		37
Other flatfish			35
Total flatfish	4	-	132
Pacific hake			
Lingcod			
Sablefish			
Other fish			1
Total age 0 fishes	4	6	140
Adult fishes			
Pacific hake			12
Northern anchovy			
Pacific herring			
Myctophids			
Midshipmen			40
Invertebrates			
Ctenophores			
Euphausiids	20		
Squid			1
Salps			

Table 24. Summary of bottom trawl catches inside Monterey Bay in 1984.

Station	217	218	219	220	221	222	225	226
Month/day	6/14	6/14	6/14	6/14	6/14	6/14	6/16	6/16
Starting time	0833	0954	1112	1235	1336	1505	1024	1243
Gear depth (m)	80	42	150	60	94	86	100	94
Bottom depth (m)	80	42	150	60	94	86	100	94
Age 0 fishes								
Rockfish								
Bocaccio							1	
Brown								
Canary							4	5
Chilipepper								
Yellowtail				1				
Shortbelly							2	1
Widow								
Other rockfish				2			94	110
Total rockfish	-	-	-	3	-	-	101	116
Flatfish								
Dover sole				2			22	11
Rex sole							1	1
Sanddabs							31	16
Other flatfish							95	732
Total flatfish	-	-	-	2	-	-	149	760
Pacific hake								
Lingcod								
Sablefish								
Other fish				4				
Total age 0 fishes	-	-	-	9	-	-	250	876
Adult fishes								
Pacific hake				13	52	4	58	105
Northern anchovy							1	
Pacific herring				11	3			
Myctophids								
Midshipmen	4			9	2		71	174
Invertebrates								
Ctenophores	100	200	50	50	50	5		
Euphausiids								
Squid						2	140	23
Salps				6				

Table 25. Summary of bottom trawl catches off Pt. Sur in 1984.

Station	223	224
Month/day	6/15	6/15
Starting time	0837	0945
Gear depth (m)	67	96
Bottom depth (m)	67	96
Age 0 fishes		
Rockfish		
Bocaccio		
Brown		
Canary		
Chilipepper		
Yellowtail		
Shortbelly		
Widow		
Other rockfish		
Total rockfish	-	-
Flatfish		
Dover sole		
Rex sole		
Sanddabs		5
Other flatfish		5
Total flatfish	-	10
Pacific hake		
Lingcod		
Sablefish		
Other fish		
Total age 0 fishes	-	10
Adult fishes		
Pacific hake		
Northern anchovy		
Pacific herring		
Myctophids		
Midshipmen		
Invertebrates		
Ctenophores	20	
Euphausiids		
Squid		
Salps		

Table 26. Summary of mid-water trawl catches off Pt. Cabrillo in 1985.

Station	202	203	204	204	205
Month/day	6/25	6/25	6/26	6/26	6/26
Starting time	2117	2312	0015	0120	0239
Gear depth (m)	10	30	30	100	30
Bottom depth (m)	70	150	554	478	734
Age 0 fishes					
Rockfish					
Bocaccio					
Brown					
Canary					
Chilipepper					
Yellowtail					
Shortbelly					
Widow					
Other rockfish					
Total rockfish	-	-	-	-	-
Flatfish					
Dover sole					
Rex sole				1	
Sanddabs		1	20		
Other flatfish					
Total flatfish	-	1	20	1	-
Pacific hake			50		
Lingcod					
Sablefish					
Other fish					
Total age 0 fishes	-	1	70	1	-
Adult fishes					
Pacific hake	2288	38	54	1	28
Northern anchovy					
Pacific herring					
Myctophids			1254	102	194
Midshipmen					
Invertebrates					
Ctenophores		50		35	
Euphausiids		30	490	50	400
Squid			29	54	59
Salps					2

Table 27. Summary of mid-water trawl catches off Irish Gulch in 1985.

Station	193	194	195	196	197	197	197
Month/day	6/22	6/22	6/22	6/23	6/23	6/23	6/22
Starting time	2123	2225	2313	2400	0310	0120	0212
Gear depth (m)	10	10	10	30	10	30	100
Bottom depth (m)	38	50	78	98	498	520	518
Age 0 fishes							
Rockfish							
Bocaccio							
Brown							
Canary				1			
Chilipepper							
Yellowtail					2		1
Shortbelly			1				
Widow							
Other rockfish							
Total rockfish	-	-	1	1	2	-	1
Flatfish							
Dover sole							
Rex sole				1			
Sanddabs				3	1	1	
Other flatfish							
Total flatfish	-	-	-	4	1	1	-
Pacific hake				5		8	1
Lingcod							
Sablefish							
Other fish				1			
Total age 0 fishes	-	-	1	11	3	9	2
Adult fishes							
Pacific hake	1325	715	385	14	177	14	56
Northern anchovy							
Pacific herring		1	1				
Myctophids							4
Midshipmen							
Invertebrates							
Ctenophores				14	52	50	19
Euphausiids	100						30
Squid				1	32	50	63
Salps						2	6

Table 28. Summary of mid-water trawl catches off Jenner in 1985.

Station	182	183	184	186	187
Month/day	6/27	6/27	6/27	6/28	6/28
Starting time	2121	2208	2248	0011	0135
Gear depth (m)	10	10	10	30	10
Bottom depth (m)	40	56	78	146	214
Age 0 fishes					
Rockfish					
Bocaccio					
Brown					
Canary					
Chilipepper					
Yellowtail	1				
Shortbelly					
Widow	3	1			
Other rockfish					
Total rockfish	4	1	-	-	-
Flatfish					
Dover sole					
Rex sole					
Sanddabs					
Other flatfish					
Total flatfish	-	-	-	-	-
Other fish					
Pacific hake					
Lingcod					
Sablefish					
Other fish					
Total age 0 fishes	4	1	-	-	-
Adult fishes					
Pacific hake		3	6	222	307
Northern anchovy					
Pacific herring	28				
Myctophids					
Midshipmen					
Invertebrates					
Ctenophores	2000	500	300	200	
Euphausiids				50	
Squid	750	3			
Salps					

Table 29. Summary of mid-water trawl catches off Pt. Reyes in 1985.

Station	165	166	168	170
Month/day	6/28	6/28	6/22	6/22
Starting time	2117	2227	0215	0130
Gear depth (m)	10	10	30	30
Bottom depth (m)	60	86	134	202
Age 0 fishes				
Rockfish				
Bocaccio				
Brown				
Canary				1
Chilipepper				
Yellowtail				
Shortbelly				
Widow	1	1		
Other rockfish				1
Total rockfish	1	1	-	2
Flatfish				
Dover sole				
Rex sole				
Sanddabs			2	2
Other flatfish				2
Total flatfish	-	-	2	4
Pacific hake	1		1	51
Lingcod				
Sablefish	2			
Other fish				2
Total age 0 fishes	4	1	3	59
Adult fishes				
Pacific hake	11	4	21	86
Northern anchovy				
Pacific herring				
Myctophids				
Midshipmen				
Invertebrates				
Ctenophores	50		25	30
Euphausiids		10	150	50
Squid				
Salps				4

Table 30. Summary of mid-water trawl catches outside Pt. Reyes in 1985.

Station	172	172	172	173	175	176	177	177	177	180	181
Month/day	6/21	6/21	6/22	6/21	6/21	6/21	6/20	6/20	6/20	6/19	6/19
Starting time	2323	2238	2400	2115	0250	0115	2222	2123	2318	2343	2120
Gear depth (m)	10	30	100	30	30	30	10	30	100	30	30
Bottom depth (m)	594	600	622	1300	3650	3900	4000	4000	4000	4200	4200
Age 0 fishes											
Rockfish											
Bocaccio											
Brown											
Canary											
Chilipepper											
Yellowtail											
Shortbelly											
Widow			1								
Other rockfish											
Total rockfish	-	-	1	-	-	-	-	-	-	-	-
Flatfish											
Dover sole	1										
Rex sole	2							1	2		
Sanddabs	27	1	4				2				
Other flatfish	1	2									
Total flatfish	31	3	4	-	-	-	2	1	2	-	-
Pacific hake	8	530	84								
Lingcod											
Sablefish											
Other fish	1					246					
=====											
Total age 0 fishes	40	533	89	-	-	246	2	1	2	-	-
Adult fishes											
Pacific hake	31	3	22	458	5			98			
Northern anchovy											
Pacific herring											
Myctophids	2	23	115	33	26	1525	355	1560	327	359	422
Midshipmen											
Invertebrates											
Ctenophores	15	16	7		5		27	136	8	26	
Euphausiids		390			30	1640	12	544	55		100
Squid	50	577	87	4	74	689	131	376	35	302	45
Salps	2		3			4	4			1	1

Table 31. Summary of mid-water trawl catches off Bolinas in 1985.

Station	161	161	161	162	163	164
Month/day	6/18	6/18	6/18	6/19	6/19	6/19
Starting time	2219	2259	2356	0050	0141	0233
Gear depth (m)	10	30	100	30	30	30
Bottom depth (m)	200	200	200	1600	2650	2800
Age 0 fishes						
Rockfish						
Bocaccio				1		
Brown						
Canary						
Chilipepper						
Yellowtail						
Shortbelly			3	1		
Widow		3	8			
Other rockfish						
Total rockfish	-	3	11	2	-	-
Flatfish						
Dover sole	4	1				1
Rex sole	4	3				1
Sanddabs	57	36	19	5	1	24
Other flatfish	8	2	3	5		4
Total flatfish	73	42	22	10	1	30
Pacific hake	3	89	143	2	3	
Lingcod						
Sablefish						
Other fish	8	3	3	5		5
Total age 0 fishes	84	137	179	19	4	35
Adult fishes						
Pacific hake	30	94	52		20	68
Northern anchovy						
Pacific herring						
Myctophids			55	327	663	172
Midshipmen						
Invertebrates						
Ctenophores		25		2	8	13
Euphausiids		5		3	2	1
Squid	100	50		500	200	
Salps	2	2	126	125	874	384

Table 32. Summary of mid-water trawl catches in the Gulf of the Farallones in 1985.

Station	141	143	137	138
Month/day	6/29	6/29	6/30	6/30
Starting time	2305	2116	0205	0040
Gear depth (m)	10	10	10	10
Bottom depth (m)	38	70	60	62
Age 0 fishes				
Rockfish				
Bocaccio				
Brown				
Canary				
Chilipepper				
Yellowtail				
Shortbelly				
Widow				
Other rockfish				
Total rockfish	-	-	-	-
Flatfish				
Dover sole				
Rex sole				
Sanddabs				
Other flatfish				
Total flatfish	-	-	-	-
Pacific hake		1		
Lingcod				
Sablefish			4	
Other fish				
Total age 0 fishes	-	1	4	-
Adult fishes				
Pacific hake	120	67	68	
Northern anchovy	49909		7	53
Pacific herring		13		
Myctophids				
Midshipmen				
Invertebrates				
Ctenophores		50	75	200
Euphausiids		50		
Squid		1	10	
Salps				

Table 33. Summary of mid-water trawl catches off the Farallon Islands in 1985.

Station	160	152	153	153	153	154	155	156	157	158	159
Month/day	6/17	6/17	6/16	6/17	6/17	6/16	6/16	6/18	6/18	6/17	6/17
Starting time	2303	0247	2334	0016	0115	2223	2102	0110	0005	2102	2200
Gear depth (m)	30	30	10	30	100	30	30	30	10	30	30
Bottom depth (m)	120	128	686	670	714	1326	2000	72	60	96	104
Age 0 fishes											
Rockfish											
Bocaccio											
Brown											
Canary											
Chilipepper											
Yellowtail		6		1			3	1		10	
Shortbelly	2	9		3	11	9	12	41		55	3
Widow	2	9			2	14	28	1	2	36	4
Other rockfish		3				2	5	1		17	
Total rockfish	4	27	-	4	13	25	48	44	2	118	7
Flatfish											
Dover sole	1								1		
Rex sole	2			2	1	3	1			4	
Sanddabs	1				17	11	11		8		6
Other flatfish				1							
Total flatfish	4	-	-	3	18	14	12	-	9	4	6
Pacific hake				5	25	800	54600		1		2
Lingcod											
Sablefish											
Other fish											
Total age 0 fishes	8	27	-	12	56	839	54660	44	12	122	15
Adult fishes											
Pacific hake	1	3676	368	2264	342	34		661		661	25
Northern anchovy			1	1		1					
Pacific herring		17						3		2	
Myctophids			1	6	3	78	12				
Midshipmen		7									
Invertebrates											
Ctenophores	12				6	12				8	5
Euphausiids	250		7		50	200	20	20	400	200	200
Squid	3		62	24	200	135	56		7	62	
Salps						1	4				

Table 34. Summary of mid-water trawl catches off of Half Moon Bay in 1985.

Station	148	148	148	149	150	151
Month/day	6/12	6/12	6/12	6/13	6/13	6/13
Starting time	2105	2202	2305	0020	0150	0315
Gear depth (m)	10	30	100	30	30	30
Bottom depth (m)	2200	2200	2200	3450	3700	3700
Age 0 fishes						
Rockfish						
Bocaccio						
Brown						
Canary						
Chilipepper						
Yellowtail		1	4			
Shortbelly			19		6	3
Widow	1		21	2		
Other rockfish		2	3		2	1
Total rockfish	1	3	47	2	8	4
Flatfish						
Dover sole	6	3				
Rex sole	25	27	7		1	
Sanddabs	14	18	9	9	22	5
Other flatfish						
Total flatfish	45	48	16	9	23	5
Pacific hake	2		1			
Lingcod						
Sablefish						
Other fish						
Total age 0 fishes	48	51	64	11	31	9
Adult fishes						
Pacific hake		7	5			
Northern anchovy						
Pacific herring						
Myctophids						
Midshipmen	12	244	1281	632	470	930
Invertebrates						
Ctenophores	50	30	24		15	
Euphausiids	20	100	1500	1800	1000	1938
Squid		338	107	185	245	93
Salps	46	100	12			

Table 35. Summary of mid-water trawl catches off Pescadero in 1985.

Station	130	131	132	133	133	133
Month/day	6/11	6/11	6/11	6/12	6/12	6/12
Starting time	2100	2200	2312	0310	0031	0132
Gear depth (m)	10	30	30	10	30	100
Bottom depth (m)	50	92	104	200	200	200
Age 0 fishes						
Rockfish						
Bocaccio						
Brown						
Canary			4			
Chilipepper						
Yellowtail	3	14	56	1	2	3
Shortbelly		44	188		7	
Widow	10	18	232		2	2
Other rockfish	1	20	33		1	1
Total rockfish	14	96	513	1	12	6
Flatfish						
Dover sole						
Rex sole						
Sanddabs		1	4	2	5	7
Other flatfish				1	2	
Total flatfish	-	1	4	3	7	7
Pacific hake			2	9	27	5
Lingcod				5		
Sablefish						
Other fish						
Total age 0 fishes	14	97	519	18	46	18
Adult fishes						
Pacific hake	816	572	49	9	1232	603
Northern anchovy	726	614	1	25	23	18
Pacific herring						
Myctophids						
Midshipmen						
Invertebrates						
Ctenophores	300			12		
Euphausiids	6500	50		100		50
Squid	371	13	9	18	5	1
Salps	3000					

Table 36. Summary of mid-water trawl catches off Davenport in 1985.

Station	123	124	126	126	126	125	125	125
Month/day	6/10	6/10	6/5	6/5	6/5	6/11	6/11	6/10
Starting time	2208	2310	2340	2245	2105	0225	0128	2355
Gear depth (m)	30	30	10	30	100	10	30	100
Bottom depth (m)	88	130	416	398	494	374	586	490
Age 0 fishes								
Rockfish								
Bocaccio								
Brown								
Canary								
Chilipepper								
Yellowtail	2				31			
Shortbelly	5	26		2		8	9	5
Widow	45	1			11	6	4	2
Other rockfish	4	1		4	8	2		
Total rockfish	56	28	-	6	50	16	13	7
Flatfish								
Dover sole					1			1
Rex sole	1			3	2			
Sanddabs	10	5		30	41		4	
Other flatfish								
Total flatfish	11	5	-	33	44	-	4	-
Pacific hake			3	456	61		4	
Lingcod								
Sablefish								
Other fish								
Total age 0 fishes	67	33	3	495	155	16	21	8
Adult fishes								
Pacific hake	19	13	99	41	832	26	34	
Northern anchovy	15	2336	499	7	20	5	30	
Pacific herring								
Myctophids				85				
Midshipmen								
Invertebrates								
Ctenophores			22	44				
Euphausiids	53			200		100		
Squid	16	4	36	20	33	12	38	16
Salps		300		10	6		2000	

Table 37. Summary of mid-water trawl catches outside Davenport in 1985.

Station	127	128	129
Month/day	6/6	6/6	6/6
Starting time	0100	0217	0337
Gear depth (m)	30	30	30
Bottom depth (m)	804	1464	2000
Age 0 fishes			
Rockfish			
Bocaccio			
Brown			
Canary			
Chilipepper			
Yellowtail			
Shortbelly			
Widow			
Other rockfish			
Total rockfish	-	-	-
Flatfish			
Dover sole	1		
Rex sole	2	1	
Sanddabs		2	
Other flatfish	1	2	
Total flatfish	4	5	-
Pacific hake	10	1	1
Lingcod			
Sablefish			
Other fish	1	1	
Total age 0 fishes	15	7	1
Adult fishes			
Pacific hake			
Northern anchovy	14	4	
Pacific herring			
Myctophids	624	269	500
Midshipmen			
Invertebrates			
Ctenophores	10	20	35
Euphausiids	45	40	750
Squid	406	640	420
Salps	50	10	25

Table 38. Summary of mid-water trawl catches inside Monterey Bay in 1985.

Station	111	114	119	112	121	115	116
Month/day	6/9	6/10	6/10	6/9	6/10	6/9	6/9
Starting time	2235	0050	0207	2107	0327	2335	0110
Gear depth (m)	30	30	30	30	30	30	30
Bottom depth (m)	52	86	90	92	84	98	318
Age 0 fishes							
Rockfish							
Bocaccio							
Brown							
Canary							
Chilipepper							
Yellowtail	1	4		1	7	3	
Shortbelly		1	1		5		
Widow	1	1	5		7	13	
Other rockfish					2	2	
Total rockfish	2	6	6	1	21	18	-
Flatfish							
Dover sole							
Rex sole							2
Sanddabs	2	2			5	3	7
Other flatfish							
Total flatfish	2	2	-	-	5	3	9
Pacific hake		40	2				141
Lingcod							
Sablefish							
Other fish							
Total age 0 fishes	4	48	8	1	26	21	150
Adult fishes							
Pacific hake	3	127	2	109	2	55	39
Northern anchovy	5541	1	3	212	1		
Pacific herring							
Myctophids		1					
Midshipmen	12	1	9		39	38	
Invertebrates							
Ctenophores							
Euphausiids							
Squid							
Salps							

Table 39. Summary of mid-water trawl catches outside Monterey Bay in 1985.

Station	109	113	118	117	110
Month/day	6/8	6/8	6/9	6/9	6/8
Starting time	2107	2352	0405	0250	2230
Gear depth (m)	30	30	30	30	30
Bottom depth (m)	574	984	1024	1980	2500
Age 0 fishes					
Rockfish					
Bocaccio					
Brown					
Canary					
Chilipepper					
Yellowtail					
Shortbelly					1
Widow	1				
Other rockfish	1	1		1	5
Total rockfish	2	1	-	1	6
Flatfish					
Dover sole					
Rex sole	1			1	4
Sanddabs			2		11
Other flatfish					2
Total flatfish	1	-	2	1	17
Pacific hake	2	104		1	166
Lingcod					
Sablefish					
Other fish	2				2
Total age 0 fishes	7	105	2	3	191
Adult fishes					
Pacific hake		1	1		70
Northern anchovy					
Pacific herring	3	15	3	9	50
Myctophids					
Midshipmen					
Invertebrates					
Ctenophores	24		20		100
Euphausiids	75	100			100
Squid	104	29	3	62	112
Salps	12				

Table 40. Summary of mid-water trawl catches off Pt. Sur in 1985.

Station	101	102	103	104	105	105	105	106	106	106
Month/day	6/7	6/7	6/7	6/8	6/8	6/6	6/8	6/6	6/6	6/7
Starting time	2105	2205	2310	0007	0306	2107	0150	2235	2328	0023
Gear depth (m)	10	10	30	30	10	30	100	10	30	100
Bottom depth (m)	58	80	116	428	906	894	916	910	1894	946
Age 0 fishes										
Rockfish										
Bocaccio										
Brown										
Canary										
Chilipepper										
Yellowtail		1	1							
Shortbelly										
Widow		3	1							
Other rockfish		3				3				1
Total rockfish	-	7	2	-	-	3	-	-	-	1
Flatfish										
Dover sole										
Rex sole		2							1	
Sanddabs	3	6	3	1			3		2	2
Other flatfish										
Total flatfish	3	8	3	1	-	-	3	-	3	2
Pacific hake		1	4	21						
Lingcod										
Sablefish										
Other fish			1							
Total age 0 fishes	3	16	10	22	-	3	3	-	3	3
Adult fishes										
Pacific hake										
Northern anchovy			2							
Pacific herring										
Myctophids				2	14	1050	263	143	1076	750
Midshipmen										
Invertebrates										
Ctenophores	40	14	10	12	4	30	12	50	20	6
Euphausiids		1900	100	200	20	250	200	100	200	500
Squid	1000		25		3			21		
Salps	6	13		45	37	275	105	216	496	363

Table 41. Summary of mid-water trawl catches off Pt. Reyes during sweep 1 of 1986.

Station	165	166	167	168	170	170	171	171
Month/day	6/11	6/11	6/11	6/10	6/10	6/10	6/9	6/9
Starting time	0302	0146	0030	2322	2110	2205	2108	2210
Gear depth (m)	10	30	30	30	10	100	30	100
Bottom depth (m)	60	86	110	134	202	248	450	450
Age 0 fishes								
Rockfish								
Bocaccio								
Brown		3	1					
Canary								
Chilipepper	1							
Yellowtail								
Shortbelly	11	3						
Widow		2						
Other rockfish		1						
Total rockfish	12	9	1	-	-	-	-	-
Flatfish								
Dover sole								
Rex sole	1							
Sanddabs	3							
Other flatfish								
Total flatfish	4	-	-	-	-	-	-	-
Pacific hake			15			6		280
Lingcod	14							
Sablefish								
Other fish	5			1				
Total age 0 fishes	35	9	16	1	-	6	-	280
Adult fishes								
Pacific hake	1	4	226	15	360	103	970	800
Northern anchovy								
Pacific herring								
Myctophids								
Midshipmen			3					
Invertebrates								
Ctenophores								
Euphausiids								
Squid								
Salps								

Table 42. Summary of mid-water trawl catches off Pt. Reyes during sweep 3 of 1986.

Station	165	166	167	168	170	171
Month/day	6/24	6/24	6/24	6/23	6/23	6/23
Starting time	0230	0138	0045	2350	2255	2112
Gear depth (m)	10	30	30	30	30	30
Bottom depth (m)	60	88	102	134	190	452
Age 0 fishes						
Rockfish						
Bocaccio					1	
Brown						
Canary			1			
Chilipepper						
Yellowtail			1			
Shortbelly			5			
Widow						
Other rockfish						
Total rockfish	-	-	7	-	1	-
Flatfish						
Dover sole						
Rex sole		1	5			3
Sanddabs	2		10	1		
Other flatfish	1					
Total flatfish	3	1	15	1	-	3
Pacific hake		7	35	10	2	36
Lingcod						
Sablefish						
Other fish		1		19		
Total age 0 fishes	3	9	57	30	3	39
Adult fishes						
Pacific hake	190	194	270		88	203
Northern anchovy						
Pacific herring						9
Myctophids	2	3	11			
Midshipmen						
Invertebrates						
Ctenophores					100	300
Euphausiids	1000	200	150		100	
Squid				1		2
Salps				4		

Table 43. Summary of mid-water trawl catches in Gulf of the Farallones during sweep 1 of 1986.

Station	141	143	137	138	139
Month/day	6/3	6/3	6/4	6/4	6/4
Starting time	2134	2310	0341	0212	0052
Gear depth (m)	10	10	10	10	10
Bottom depth (m)	42	58	58	64	64
Age 0 fishes					
Rockfish					
Bocaccio			2	1	2
Brown	1	2	7	6	4
Canary	2	2	3	4	3
Chilipepper					
Yellowtail	1	5	2		
Shortbelly			2	10	3
Widow					
Other rockfish	1	2		1	
Total rockfish	5	11	16	22	12
Flatfish					
Dover sole	1	3		1	
Rex sole					
Sanddabs	2	20	32	13	22
Other flatfish					
Total flatfish	3	23	32	14	22
Pacific hake	1			2	2
Lingcod	6	1		3	
Sablefish					
Other fish	10	10	2		2
Total age 0 fishes	25	45	50	41	38
Adult fishes					
Pacific hake	31	1	18		
Northern anchovy		6		2	2
Pacific herring					
Myctophids					
Midshipmen	3	15	4	5	13
Invertebrates					
Ctenophores	100	20	1000	20	100
Euphausiids	200	20000	1000	2000	600
Squid			25		2
Salps	2		8	15	

Table 44. Summary of mid-water trawl catches in Gulf of the Farallones during sweep 2 of 1986.

Station	141	143	137	138	139
Month/day	6/11	6/11	6/12	6/12	6/11
Starting time	2247	2112	0232	0100	2358
Gear depth (m)	10	10	10	10	10
Bottom depth (m)	46	64	60	76	64
Age 0 fishes					
Rockfish					
Bocaccio		1			
Brown		6	10		11
Canary		1			1
Chilipepper			1		
Yellowtail		5			
Shortbelly			33	16	8
Widow					1
Other rockfish			1	1	3
Total rockfish	-	13	45	17	24
Flatfish					
Dover sole			1		
Rex sole			1		
Sanddabs		2	66	151	8
Other flatfish					
Total flatfish	-	2	68	151	8
Pacific hake					
Lingcod	5	75		1	
Sablefish					
Other fish		1			
Total age 0 fishes	5	91	116	169	32
Adult fishes					
Pacific hake	60	23	137	74	43
Northern anchovy	20	23			
Pacific herring					
Myctophids					
Midshipmen			3		107
Invertebrates					
Ctenophores			1000		1
Euphausiids	500	80000	5000		
Squid	60		20		
Salps					

Table 45. Summary of mid-water trawl catches in the Gulf of the Farallones during sweep 3 of 1986.

Station	141	143	137	138	139
Month/day	6/24	6/24	6/25	6/25	6/25
Starting time	2251	2111	0304	0127	0006
Gear depth (m)	10	10	10	10	10
Bottom depth (m)	46	60	60	66	64
Age 0 fishes					
Rockfish					
Bocaccio					
Brown					
Canary					
Chilipepper					
Yellowtail				1	
Shortbelly					
Widow					
Other rockfish					
Total rockfish	-	-	-	1	-
Flatfish					
Dover sole					
Rex sole	1	1	3		1
Sanddabs		5	13	45	8
Other flatfish		1			
Total flatfish	1	7	16	45	9
Pacific hake					
Lingcod					
Sablefish					
Other fish	2	26	1	1	1
Total age 0 fishes	3	33	17	47	10
Adult fishes					
Pacific hake	52	408	84	95	192
Northern anchovy	89				7
Pacific herring	1	1		18	1
Myctophids					
Midshipmen	4			1	12
Invertebrates					
Ctenophores			100		200
Euphausiids		100			
Squid	42		25		3
Salps					

Table 46. Summary of mid-water trawl catches off the Farallon Islands during sweep 1 of 1986.

Station	156	160	152
Month/day	6/10	6/10	6/8
Starting time	0254	0055	2117
Gear depth (m)	30	30	30
Bottom depth (m)	72	100	116
Age 0 fishes			
Rockfish			
Bocaccio	1		
Brown	8		
Canary	3		
Chilipepper			
Yellowtail			
Shortbelly	22		5
Widow			
Other rockfish			
Total rockfish	34	-	5
Flatfish			
Dover sole			
Rex sole			
Sanddabs	2		1
Other flatfish			5
Total flatfish	2	-	6
Pacific hake			5
Lingcod			
Sablefish			
Other fish			
Total age 0 fishes	36	-	16
Adult fishes			
Pacific hake	74	252	12
Northern anchovy			
Pacific herring	1		
Myctophids			
Midshipmen			10
Invertebrates			
Ctenophores			
Euphausiids			10000
Squid			
Salps			

Table 47. Summary of mid-water trawl catches off the Farallon Islands during sweep 2 of 1986.

Station	156	160	152	154
Month/day	6/18	6/18	6/17	6/17
Starting time	0039	0234	2130	2305
Gear depth (m)	30	30	30	30
Bottom depth (m)	70	90	116	1500

Age 0 fishes

Rockfish

Bocaccio				
Brown				
Canary				
Chilipepper				
Yellowtail			1	1
Shortbelly			2	
Widow				
Other rockfish				

Total rockfish	-	-	3	1
----------------	---	---	---	---

Flatfish

Dover sole				
Rex sole		3	10	1
Sanddabs			1	1
Other flatfish				

Total flatfish	-	3	11	2
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Pacific hake			1	46
Lingcod				
Sablefish				
Other fish				

Total age 0 fishes	-	3	15	49
--------------------	---	---	----	----

Adult fishes

Pacific hake	8	28	6	
Northern anchovy				
Pacific herring				
Myctophids				488
Midshipmen	3			

Invertebrates

Ctenophores	50	500	200	400
Euphausiids	100	300	50	
Squid	4			58
Salps	12			

Table 48. Summary of mid-water trawl catches off Pescadero during sweep 1 in 1986.

Station	130	131	132	133	133	134
Month/day	6/4	6/4	6/4	6/5	6/5	6/5
Starting time	2111	2221	2323	0120	0216	0416
Gear depth (m)	10	30	30	30	100	30
Bottom depth (m)	56	98	106	204	204	600
Age 0 fishes						
Rockfish						
Bocaccio	5		1	250	168	12
Brown	3	3	6	124	12	
Canary		1		4	12	
Chilipepper		1	4	7	36	
Yellowtail			1		24	
Shortbelly	3		8	3947	15900	2400
Widow			4	1	36	
Other rockfish			2	25	24	
Total rockfish	11	5	26	4358	16212	2412
Flatfish						
Dover sole			2	1		
Rex sole			4	11		4
Sanddabs	2	30	66	404	624	56
Other flatfish						
Total flatfish	2	30	72	416	624	60
Pacific hake		14	1	252	1086	1132
Lingcod						
Sablefish		1				
Other fish		4		14	111	
Total age 0 fishes	13	54	99	5040	18033	3604
Adult fishes						
Pacific hake		64			6	
Northern anchovy						
Pacific herring						
Myctophids						1100
Midshipmen		25	16	2		
Invertebrates						
Ctenophores	45000	2000	2500	100		550
Euphausiids	5000	100	200	450	24000	350
Squid	2750	65	10	37	36	67
Salps				21		2

Table 49. Summary of mid-water trawl catches off Pescadero during sweep 2 in 1986.

Station	130	131	132	133	134
Month/day	6/12	6/12	6/12	6/13	6/13
Starting time	2136	2245	2350	2244	2121
Gear depth (m)	10	30	30	30	30
Bottom depth (m)	60	94	108	198	584
Age 0 fishes					
Rockfish					
Bocaccio		2	1	3	5
Brown	3	85	5	8	27
Canary	1	4			2
Chilipepper	1	6	1	2	6
Yellowtail		2			
Shortbelly	2	4		31	84
Widow					1
Other rockfish		1			1
Total rockfish	7	104	7	44	126
Flatfish					
Dover sole					1
Rex sole					12
Sanddabs		6	8		13
Other flatfish				72	1
Total flatfish	-	6	8	72	27
Pacific hake		11	27	223	2526
Lingcod		1			
Sablefish					
Other fish	5	4		39	9
Total age 0 fishes	12	126	42	378	2688
Adult fishes					
Pacific hake		349	297	20	
Northern anchovy	112				
Pacific herring					
Myctophids	600				
Midshipmen		17	7		
Invertebrates					
Ctenophores	500000	1000			
Euphausiids				200	200
Squid		50		2	51
Salps					

Table 50. Summary of mid-water trawl catches off Pescadero during sweep 3 in 1986.

Station	130	131	132	133	134
Month/day	6/20	6/20	6/21	6/21	6/21
Starting time	2219	2328	0027	0206	0357
Gear depth (m)	30	30	30	30	30
Bottom depth (m)	56	96	108	198	576
Age 0 fishes					
Rockfish					
Bocaccio					
Brown	3		2		2
Canary					
Chilipepper					1
Yellowtail					1
Shortbelly			1	1	19
Widow					
Other rockfish					
Total rockfish	3	-	3	1	23
Flatfish					
Dover sole					2
Rex sole	1	1	1		6
Sanddabs	18	1	1	6	
Other flatfish					
Total flatfish	19	2	2	6	8
Pacific hake				6	
Lingcod					
Sablefish					
Other fish					
Total age 0 fishes	22	2	5	13	31
Adult fishes					
Pacific hake	37	2	8	33	
Northern anchovy	16	14	15	3	
Pacific herring				1	
Myctophids	2				122
Midshipmen					
Invertebrates					
Ctenophores	500		200	100	200
Euphausiids		30	100	200	100
Squid	301	8	8	3	72
Salps				2	

Table 51. Summary of mid-water trawl catches off Davenport during sweep 1 in 1986.

Station	122	123	124	126	125	125
Month/day	6/5	6/5	6/5	6/6	6/6	6/6
Starting time	2116	2212	2318	0232	0004	0101
Gear depth (m)	10	30	30	30	30	100
Bottom depth (m)	54	86	132	412	-580	580
Age 0 fishes						
Rockfish						
Bocaccio	1			5	1	2
Brown	4	7	11	9	5	1
Canary		2	1	9		
Chilipepper		2	3		2	
Yellowtail						
Shortbelly	10	10	14	373	14	4
Widow		1			1	1
Other rockfish		2		36	2	
Total rockfish	15	24	29	432	25	8
Flatfish						
Dover sole				9		
Rex sole		2	1	27	8	8
Sanddabs	5	32	6	95	10	27
Other flatfish						
Total flatfish	5	34	7	131	18	35
Pacific hake		3	8	495	17	4
Lingcod	1					
Sablefish						
Other fish	2	2		14	133	121
Total age 0 fishes	23	63	44	1072	193	168
Adult fishes						
Pacific hake		2		20		
Northern anchovy						
Pacific herring						
Myctophids		2		1223		1
Midshipmen	168					
Invertebrates						
Ctenophores	12000	10000	500		500	5000
Euphausiids	4000		2000	1818	1000	150
Squid	99	12		114	3	2
Salps				150		9

Table 52. Summary of mid-water trawl catches off Davenport during sweep 2 in 1986.

Station	122	123	124	126	125	125
Month/day	6/15	6/15	6/15	6/16	6/16	6/16
Starting time	2110	2227	2340	0337	0133	0039
Gear depth (m)	10	30	30	30	30	100
Bottom depth (m)	42	180	130	430	500	542
Age 0 fishes						
Rockfish						
Bocaccio				7	1	1
Brown		2		6	1	1
Canary						1
Chilipepper						
Yellowtail				1		
Shortbelly			39	308	183	16
Widow						
Other rockfish						
Total rockfish	-	2	39	322	185	19
Flatfish						
Dover sole					3	1
Rex sole			15	62	87	10
Sanddabs		9	10	34	37	16
Other flatfish						
Total flatfish	-	9	25	96	127	27
Pacific hake				1776	2	11
Lingcod						
Sablefish						
Other fish		1			8	1
Total age 0 fishes	-	12	64	2194	322	58
Adult fishes						
Pacific hake	5	28		1		19
Northern anchovy				1		2
Pacific herring						
Myctophids				89		
Midshipmen	3	38				
Invertebrates						
Ctenophores	500		500	100	300	
Euphausiids		50	100	100	200	150
Squid	101	2	2	66	13	4
Salps	8			3	12	

Table 53. Summary of mid-water trawl catches off Davenport during sweep 3 in 1986.

Station	122	123	124	126	125
Month/day	6/22	6/21	6/21	6/22	6/26
Starting time	2117	2237	2339	0306	0026
Gear depth (m)	10	30	30	30	30
Bottom depth (m)	40	94	132	408	480
Age 0 fishes					
Rockfish					
Bocaccio		1		2	
Brown		1		14	
Canary					
Chilipepper				1	
Yellowtail					
Shortbelly		2		51	
Widow					
Other rockfish					
Total rockfish	-	4	-	68	-
Flatfish					
Dover sole	2			2	1
Rex sole		10	2	17	10
Sanddabs	1	3	1	33	2
Other flatfish					1
Total flatfish	3	13	3	52	14
Pacific hake			1	210	1
Lingcod					
Sablefish					
Other fish				104	
Total age 0 fishes	3	17	4	434	15
Adult fishes					
Pacific hake					
Northern anchovy					
Pacific herring					
Myctophids	1				7
Midshipmen					
Invertebrates					
Ctenophores	100	100		500	100
Euphausiids		200	100	500	100
Squid	78	2	1		1
Salps		100	200		

Table 54. Summary of mid-water trawl catches inside Monterey Bay during sweep 1 in 1986.

Station	111	114	119	112	112	115	116
Month/day	6/6	6/7	6/7	6/6	6/6	6/7	6/7
Starting time	2327	0249	0405	2110	2205	0038	0128
Gear depth (m)	10	30	30	10	30	30	30
Bottom depth (m)	44	82	94	96	96	100	380
Age 0 fishes							
Rockfish							
Bocaccio							
Brown							
Canary							
Chilipepper							
Yellowtail							
Shortbelly		4	12	9	5	1	
Widow		1					
Other rockfish				1			
Total rockfish		5	12	10	5	1	-
Flatfish							
Dover sole							
Rex sole		1	4				
Sanddabs		1	20	4			
Other flatfish	1	3					
Total flatfish	1	5	24	4	-	-	-
Pacific hake		143					
Lingcod							
Sablefish					14		
Other fish							
Total age 0 fishes	1	153	36	14	19	1	-
Adult fishes							
Pacific hake	12	45	232	14	102	11	632
Northern anchovy	1500		16				
Pacific herring							
Myctophids		16					48
Midshipmen	1		60		12	6	
Invertebrates							
Ctenophores		1000	3200		300	250	200
Euphausiids				1800	1000	100	100
Squid	6	5	60	74	25	4	20
Salps				1	1		24

Table 55. Summary of mid-water trawl catches inside Monterey Bay during sweep 2 in 1986.

Station	111	114	119	112	112	115
Month/day	6/14	6/15	6/15	6/14	6/14	6/15
Starting time	2131	0213	0344	2249	2347	0051
Gear depth (m)	10	30	30	10	30	30
Bottom depth (m)	44	90	100	98	98	100
Age 0 fishes						
Rockfish						
Bocaccio		5		14	2	5
Brown		6				11
Canary						1
Chilipepper		1				4
Yellowtail						
Shortbelly		68	2	663	667	150
Widow						
Other rockfish				1	1	
Total rockfish	-	80	2	678	670	171
Flatfish						
Dover sole	2					1
Rex sole		15	8	9	1	21
Sanddabs	9	33	6	19	10	55
Other flatfish						
Total flatfish	11	48	14	28	11	77
Pacific hake		131		11	5	16
Lingcod		10	2	25	15	82
Sablefish						
Other fish						
Total age 0 fishes	11	269	18	742	701	346
Adult fishes						
Pacific hake	7	41	25			2
Northern anchovy						
Pacific herring						
Myctophids		14				
Midshipmen	1		26			
Invertebrates						
Ctenophores		1000	200			
Euphausiids	50000	500	500			
Squid	42	51	150	26		
Salps				1		

Table 56. Summary of mid-water trawl catches outside Monterey Bay during sweep 1 in 1986.

Station	109	113	118	117	110
Month/day	6/7	6/8	6/8	6/8	6/7
Starting time	2046	0027	0235	0130	2243
Gear depth (m)	30	30	30	30	30
Bottom depth (m)	700	1000	1100	2000	2450
Age 0 fishes					
Rockfish					
Bocaccio			1	2	1
Brown			21	35	
Canary					
Chilipepper			2	4	1
Yellowtail					
Shortbelly			39	394	
Widow					
Other rockfish			2		
Total rockfish	-	-	65	435	2
Flatfish					
Dover sole			2		
Rex sole			27	21	
Sanddabs			51	2	1
Other flatfish			1		
Total flatfish	-	-	81	23	1
Pacific hake			97	81	5
Lingcod					
Sablefish					
Other fish				11	
Total age 0 fishes	-	-	243	550	8
Adult fishes					
Pacific hake	300	528		5	103
Northern anchovy			116		2
Pacific herring					
Myctophids			185	64501	13
Midshipmen					
Invertebrates					
Ctenophores	100			193	
Euphausiids		500		375	100
Squid	6	20		23	34
Salps	2				2

Table 57. Summary of mid-water trawl catches outside Monterey Bay during sweep 2 in 1986.

Station	109	113	117	110	110
Month/day	6/16	6/17	6/17	6/16	6/16
Starting time	2350	0055	0206	2112	2213
Gear depth (m)	30	30	30	30	100
Bottom depth (m)	770	900	2080	2300	2300
Age 0 fishes					
Rockfish					
Bocaccio	4		1	1	
Brown	1	1	4		1
Canary					
Chilipepper					
Yellowtail					
Shortbelly	63	11	32	3	5
Widow					
Other rockfish			2		
Total rockfish	68	12	39	4	6
Flatfish					
Dover sole	39	5	28	5	7
Rex sole	4	1	91	2	
Sanddabs					
Other flatfish					
Total flatfish	43	6	119	7	7
Pacific hake	18	23	29	3	11
Lingcod					
Sablefish					
Other fish	11	6	5		5
Total age 0 fishes	140	47	192	14	29
Adult fishes					
Pacific hake	21	1	3	69	10
Northern anchovy					
Pacific herring					
Myctophids	10	34	132	47	231
Midshipmen					
Invertebrates					
Ctenophores	1000	500	2000	1000	500
Euphausiids	200	50	400		
Squid	23	17	37	82	
Salps				2	

Table 58. Summary of mid-water trawl catches outside Monterey Bay during sweep 3 in 1986.

Station	109	113	118	117	110	110
Month/day	6/23	6/22	6/22	6/22	6/23	6/23
Starting time	0028	2332	2120	2227	0159	0240
Gear depth (m)	30	30	30	30	30	100
Bottom depth (m)	700	928	1100	2050	2600	2600

Age 0 fishes

Rockfish

Bocaccio						
Brown					1	2
Canary						
Chilipepper				3		
Yellowtail						
Shortbelly		1	1	29		2
Widow						
Other rockfish						

Total rockfish	-	1	1	32	1	4
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Flatfish

Dover sole						
Rex sole	6	3	5	26	87	15
Sanddabs	2	5	17	7	35	18
Other flatfish		1				

Total flatfish	8	9	22	33	122	33
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Pacific hake		34	1127	1728	90	87
Lingcod						
Sablefish	11	1	1	1		
Other fish						

Total age 0 fishes	19	45	1151	1794	213	124
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Adult fishes

Pacific hake		14		7	10	7
Northern anchovy						
Pacific herring						
Myctophids	10	27	60	17	189	992
Midshipmen						

Invertebrates

Ctenophores	200	400	500	300	1000	507
Euphausiids	100			50	100	1000
Squid	15	20	38	33	93	73
Salps				1	3	

Table 59. Summary of mid-water trawl catches off Pt. Reyes in April 1987.

Station	165	166	167	168	170	170	170	171
Month/day	4/12	4/12	4/12	4/13	4/13	4/13	4/13	4/13
Starting time	2030	2133	2253	0018	0205	0120	0250	0414
Gear depth (m)	10	30	30	30	10	30	100	30
Bottom depth (m)	60	84	102	136	206	206	206	392
Age 0 fishes								
Rockfish								
Bocaccio								
Brown	1	2		1				
Canary		1						
Chilipepper								
Yellowtail								
Shortbelly								
Widow								
Other rockfish							1	
Total rockfish	1	3	-	1	-	-	1	-
Flatfish								
Dover sole			1		2		1	
Rex sole								
Sanddabs		42	6	16	35	30	65	2
Other flatfish		5	3	8	209	15	40	7
Total flatfish	-	47	10	24	246	45	106	9
Pacific hake					1			
Lingcod								
Sablefish								
Other fish		1					1	
Total age 0 fishes	1	51	10	25	247	46	107	9
Adult fishes								
Pacific hake								1
Northern anchovy							1	6
Pacific herring	3							
Myctophids								79
Midshipmen								
Invertebrates								
Ctenophores	51	176	60			200	200	80
Euphausiids	5	24	57			300		
Squid					1		1	2
Salps	1	401	210	2142	1320	664	6501	300

Table 60. Summary of mid-water trawl catches over Cordell Bank in April 1987.

Station	208	208	209	210	162	162
Month/day	4/13	4/14	4/13	4/13	4/14	4/14
Starting time	2300	0003	2140	2029	0417	0508
Gear depth (m)	10	30	10	10	30	100
Bottom depth (m)	128	128	86	70	1320	1320
Age 0 fishes						
Rockfish						
Bocaccio						
Brown						
Canary		1	1			1
Chilipepper			2	1		1
Yellowtail						
Shortbelly		1	8	1		
Widow						1
Other rockfish	1					
Total rockfish	1	2	11	2	-	3
Flatfish						
Dover sole						
Rex sole						
Sanddabs	20	26	1	1	1	4
Other flatfish	20	95		2	1	5
Total flatfish	40	121	1	3	2	9
Pacific hake		1				
Lingcod						
Sablefish						
Other fish					1	
Total age 0 fishes	41	124	12	5	3	12
Adult fishes						
Pacific hake				1	281	105
Northern anchovy						
Pacific herring						
Myctophids			2	7	71	278
Midshipmen						
Invertebrates						
Ctenophores			12	24		150
Euphausiids			1035		50	
Squid					4	4
Salps	7	1980	632		1120	1052

Table 61. Summary of mid-water trawl catches in the Gulf of the Farallones in April 1987.

Station	143	141	139	138	137	241	242
Month/day	4/10	4/10	4/11	4/11	4/11	4/12	4/12
Starting time	2205	2340	0251	0059	0131	0223	0410
Gear depth (m)	10	10	10	10	10	10	10
Bottom depth (m)	46	64	64	60	54	68	106
Age 0 fishes							
Rockfish							
Bocaccio		1					
Brown		1					
Canary		1					
Chilipepper							2
Yellowtail							
Shortbelly			1	1			
Widow							
Other rockfish		1			2	1	
Total rockfish	-	4	1	1	2	1	2
Flatfish							
Dover sole							
Rex sole							
Sanddabs	2	2	2	5	37	6	3
Other flatfish	3	1		2	3		
Total flatfish	5	3	2	7	40	6	3
Pacific hake	4	12					
Lingcod		46			11	2	
Sablefish							
Other fish	2	4	5	1			
Total age 0 fishes	11	69	8	9	53	9	5
Adult fishes							
Pacific hake			1			52	
Northern anchovy		14			1	456	
Pacific herring	1	77			6		
Myctophids							
Midshipmen					6	2	
Invertebrates							
Ctenophores	13	100	50	12			20
Euphausiids	460		200	1000	52	200	25
Squid			1	8	7	36	
Salps	161		12	800			55

Table 62. Summary of mid-water trawl catches off the Farallon Islands in April 1987.

Station	152	154	156	160	160	244	245	246	247
Month/day	4/14	4/14	4/14	4/14	4/14	4/21	4/21	4/22	4/22
Starting time	2037	2333	2215	0241	0417	2024	2334	0148	0427
Gear depth (m)	10	30	30	10	30	30	30	30	30
Bottom depth (m)	96	1400	72	98	98	4250	3600	2200	104
Age 0 fishes									
Rockfish									
Bocaccio				1		1		11	
Brown					5				
Canary					7				
Chilipepper				1	16			12	1
Yellowtail									
Shortbelly			5		14		5	23	
Widow									
Other rockfish			3		11	1		6	
Total rockfish	-	-	8	2	53	2	5	52	1
Flatfish									
Dover sole			1	4	1				
Rex sole					1				
Sanddabs	34	9	6	12	38	6	29	56	133
Other flatfish	7	10	1	22	41		87	72	
Total flatfish	41	19	8	38	81	6	116	128	133
Pacific hake		1		1	4		3		
Lingcod						6			
Sablefish									
Other fish		2	2				23	2	
Total age 0 fishes	41	22	18	41	138	14	147	182	134
Adult fishes									
Pacific hake					1			1	24
Northern anchovy									
Pacific herring									
Myctophids		107				12	801	986	
Midshipmen	1								
Invertebrates									
Ctenophores	150	250						300	100
Euphausiids		2000	2000	300	500				200
Squid	4	1	14		3		13	53	
Salps	1052	32	30	291	524	31020		4017	400

Table 63. Summary of mid-water trawl catches over the Pioneer Seamount in April 1987.

Station	211	212	213	213	213
Month/day	4/15	4/15	4/15	4/15	4/15
Starting time	0614	0453	0346	0215	0257
Gear depth (m)	60	50	10	30	80
Bottom depth (m)	2200	1300	1136	1136	1136
Age 0 fishes					
Rockfish					
Bocaccio	2			1	
Brown					
Canary					1
Chilipepper		7		2	23
Yellowtail					
Shortbelly	2	134	2		59
Widow					7
Other rockfish		1		1	6
Total rockfish	4	142	2	4	96
Flatfish					
Dover sole		1			
Rex sole					
Sanddabs	87	107	170	40	174
Other flatfish	155	196	493	127	121
Total flatfish	242	304	663	167	295
Pacific hake					
Lingcod					
Sablefish					
Other fish	2		1	1	1
Total age 0 fishes	248	446	666	172	392
Adult fishes					
Pacific hake					
Northern anchovy					
Pacific herring					
Myctophids	355	258	29	810	836
Midshipmen					
Invertebrates					
Ctenophores	400			200	
Euphausiids	100			100	
Squid	1	9	2	3	26
Salps	800	4000	3000	500	607

Table 64. Summary of mid-water trawl catches near the Pioneer Seamount in April 1987.

Station	243	213	250	251	252	253	254
Month/day	4/20	4/20	4/21	4/21	4/21	4/21	4/21
Starting time	2147	2335	0032	0154	0303	0425	0539
Gear depth (m)	30	30	30	30	30	30	30
Bottom depth (m)	1566	1156	2600	3600	3800	4000	4000
Age 0 fishes							
Rockfish							
Bocaccio		1	7	35		1	
Brown		1	1				
Canary	10	1					
Chilipepper	6	73	35	4			
Yellowtail				1			
Shortbelly	14	126	12	186	28	23	
Widow		1		5	1		
Other rockfish	3	6	2	6			
Total rockfish	33	209	57	237	29	24	-
Flatfish							
Dover sole							
Rex sole				1			
Sanddabs	17	132	78	324			30
Other flatfish	148		42	4754			70
Total flatfish	165	132	120	5079	-	-	100
Pacific hake	1			270	192		1125
Lingcod							
Sablefish							
Other fish			18	15	4	2	
Total age 0 fishes	199	341	195	5601	225	26	1225
Adult fishes							
Pacific hake							
Northern anchovy							
Pacific herring							
Myctophids	1304	870	229	176	760		95
Midshipmen							
Invertebrates							
Ctenophores	108	600	168		40		
Euphausiids	1080		700				
Squid	12	24	10	122	440		
Salps	2089	1210	1793	1350	566		51225

Table 65. Summary of mid-water trawl catches off Pescadero in April 1987.

Station	130	131	132	133	133	133	134
Month/day	4/16	4/16	4/16	4/15	4/16	4/15	4/15
Starting time	0423	0317	0206	2255	0026	2345	2118
Gear depth (m)	10	30	30	10	30	100	30
Bottom depth (m)	54	98	98	196	196	196	568
Age 0 fishes							
Rockfish							
Bocaccio							
Brown	2		1				
Canary							8
Chilipepper	2		22	1	5	3	55
Yellowtail							
Shortbelly			8				79
Widow							1
Other rockfish	1	2	3				3
Total rockfish	5	2	34	1	5	3	146
Flatfish							
Dover sole		6					
Rex sole							
Sanddabs	1	29	38		2	2	11
Other flatfish	1	27	33	6	4	7	34
Total flatfish	2	62	71	6	6	9	45
Pacific hake		5	7		5	3	4
Lingcod	7	1	16				
Sablefish			1				
Other fish	2	2					
Total age 0 fishes	16	72	129	7	16	15	195
Adult fishes							
Pacific hake		5	1	1	2	7	
Northern anchovy	78						
Pacific herring							
Myctophids				2			119
Midshipmen	2	2	1				
Invertebrates							
Ctenophores			192	72		50	418
Euphausiids	92000	7200	600	50	100	200	6600
Squid	368	2	47				2
Salps	17	546	387	949	10	200	704

Table 66. Summary of mid-water trawl catches off Davenport in April 1987.

Station	122	123	124	125	125	126	126	126	248
Month/day	4/16	4/16	4/16	4/17	4/17	4/17	4/17	4/17	4/17
Starting time	2033	2130	2308	0008	0057	0325	0245	0416	0542
Gear depth (m)	10	30	30	30	100	10	30	100	30
Bottom depth (m)	36	82	124	490	476	410	404	412	592
Age 0 fishes									
Rockfish									
Bocaccio						2	1		7
Brown			1				2		1
Canary									2
Chilipepper				1		26	44	9	171
Yellowtail									
Shortbelly				1		9	69	6	450
Widow							1		1
Other rockfish		2	3	2		1	7	3	16
Total rockfish	-	2	4	4	-	38	124	18	648
Flatfish									
Dover sole		6						1	
Rex sole									
Sanddabs		197	100	36	8	39	381	24	136
Other flatfish		213	30	26	21	240	173	36	248
Total flatfish	-	416	130	62	29	279	554	61	384
Pacific hake		1	9	5	5	2	24	4	25
Lingcod		1			2			3	
Sablefish									
Other fish		3	2	1		5	41	2	34
Total age 0 fishes	-	423	145	72	36	324	743	88	1091
Adult fishes									
Pacific hake	tons	2	17	1	85				
Northern anchovy	tons	18	1	1					
Pacific herring	yes								
Myctophids							3	2	3
Midshipmen		21	14	6	31		2		
Invertebrates									
Ctenophores			100	640	50		2240		
Euphausiids		2000	10000	4000	100		14000	2160	312
Squid	yes	253	160	1				1	2
Salps		14	7	100	3	2812	170	724	106

Table 67. Summary of mid-water trawl catches inside Monterey Bay in April 1987.

Station	111	112	112	114	115	116	119
Month/day	4/19	4/19	4/19	4/20	4/19	4/20	4/20
Starting time	2214	2025	2107	0400	2324	0003	0223
Gear depth (m)	10	10	30	30	30	30	30
Bottom depth (m)	42	82	82	84	100	430	96
Age 0 fishes							
Rockfish							
Bocaccio							
Brown							
Canary							
Chilipepper	10	2	3		1		
Yellowtail							
Shortbelly							
Widow					1		
Other rockfish	2		2	2	4	1	3
Total rockfish	12	2	5	2	6	1	3
Flatfish							
Dover sole			1				
Rex sole							
Sanddabs	68		3	110	60	40	17
Other flatfish				59	62	16	1
Total flatfish	68	-	4	169	122	56	18
Pacific hake				7	3		7
Lingcod							
Sablefish							
Other fish			5	2	1	1	
Total age 0 fishes	80	2	14	180	132	58	28
Adult fishes							
Pacific hake				14			2
Northern anchovy	650		20	43	342		615
Pacific herring		1					
Myctophids				6		656	
Midshipmen	8		10	8	84		63
Invertebrates							
Ctenophores		50	50	200	20	8	200
Euphausiids				100		3200	200
Squid	25	28	195	149	81	72	277
Salps	9	35	23	14	13	97	17

Table 68. Summary of mid-water trawl catches outside Monterey Bay in April 1987.

Station	109	110	110	110	113	117	118
Month/day	4/18	4/18	4/18	4/18	4/17	4/17	4/17
Starting time	0045	0155	0233	0324	2322	2215	2038
Gear depth (m)	30	10	30	100	30	30	30
Bottom depth (m)	680	2560	2560	2560	1150	2200	622
Age 0 fishes							
Rockfish							
Bocaccio		5			3	21	3
Brown							1
Canary			1			7	
Chilipepper	10	8	10	2	21	1535	110
Yellowtail							
Shortbelly	4	6	8	2	15	472	11
Widow			1		1	16	
Other rockfish	2		7	4	21	23	9
Total rockfish	16	19	27	8	61	2074	134
Flatfish							
Dover sole					1		
Rex sole							
Sanddabs	24	12	206		200	149	83
Other flatfish	8	240	184	97	30	207	30
Total flatfish	32	252	390	97	231	356	113
Pacific hake	1		41	27		17	4
Lingcod							2
Sablefish							
Other fish					10	2	
Total age 0 fishes	49	271	458	132	302	2449	253
Adult fishes							
Pacific hake						1	14
Northern anchovy							2
Pacific herring							
Myctophids	80		80	38	330	1301	56
Midshipmen							
Invertebrates							
Ctenophores			20				
Euphausiids	14401			10240	12800	30875	
Squid	2	2	23	25	20	14	1
Salps	46	2800	153	70	160	227	

Table 69. Summary of mid-water trawl catches off Pt. Reyes during sweep 1 of May-June 1987.

Station	165	166	167	168	170	170	170
Month/day	5/29	5/29	5/29	5/29	5/29	5/29	5/29
Starting time	0205	0318	0408	2054	2324	2148	2236
Gear depth (m)	10	30	30	30	10	30	100
Bottom depth (m)	60	86	110	134	202	248	450
Age 0 fishes							
Rockfish							
Bocaccio			1				
Brown							
Canary	1	2					
Chilipepper	13	7	6		1	2	1
Yellowtail							
Shortbelly	3	12	2				
Widow	4	7	3				
Other rockfish	5	7	4		1		2
Total rockfish	26	35	16	-	2	2	3
Flatfish							
Dover sole							1
Rex sole			2				
Sanddabs	3			12	7	12	
Other flatfish	35	38	11	7	3	9	
Total flatfish	38	38	13	19	10	21	1
Pacific hake			2				11
Lingcod							
Sablefish							
Other fish	2	2	1				
Total age 0 fishes	66	75	32	19	12	23	15
Adult fishes							
Pacific hake			4	105	13	484	341
Northern anchovy							
Pacific herring	1						
Myctophids							
Midshipmen		1					
Invertebrates							
Ctenophores	1000	2000	100				
Euphausiids			40000				
Squid	1			165	54		18
Salps		200		42	304	12	4

Table 70. Summary of mid-water trawl catches off Pt. Reyes during sweep 2 of May-June 1987.

Station	165	166	167	168	170	170	170
Month/day	6/6	6/6	6/6	6/7	6/7	6/7	6/7
Starting time	2102	2158	2301	0033	0142	0222	0309
Gear depth (m)	10	30	30	30	10	30	100
Bottom depth (m)	60	88	102	144	452	452	452
Age 0 fishes							
Rockfish							
Bocaccio			1				
Brown							
Canary		2	5	3	1		3
Chilipepper							
Yellowtail	7	4	6		1		1
Shortbelly	54	11	40	11		1	10
Widow	24	9	22	2		1	15
Other rockfish	28	19	6		1		19
Total rockfish	113	45	80	16	3	2	48
Flatfish							
Dover sole			1				
Rex sole				1		3	2
Sanddabs	1	4	15	4			
Other flatfish	3	51	25	2			11
Total flatfish	4	55	41	7	-	3	13
Pacific hake	4	37	36	67		12	48
Lingcod							
Sablefish							
Other fish	8			1			
Total age 0 fishes	129	137	157	91	3	17	109
Adult fishes							
Pacific hake	54	13	192	158	214	540	43
Northern anchovy							
Pacific herring							
Myctophids						10	5
Midshipmen		2	4				
Invertebrates							
Ctenophores	5000	2000	600	2000	10	25	
Euphausiids	21840	2000	275	400			1200
Squid		50			23		100
Salps					1		

Table 71. Summary of mid-water trawl catches off Pt. Reyes during sweep 3 of May-June 1987.

Station	165	166	167	168	170	170	170
Month/day	6/19	6/19	6/19	6/19	6/18	6/18	6/18
Starting time	0412	0304	0203	0033	2138	2224	2317
Gear depth (m)	10	30	30	30	10	30	100
Bottom depth (m)	60	88	102	134	452	452	452
Age 0 fishes							
Rockfish							
Bocaccio							
Brown							
Canary				1			
Chilipepper							
Yellowtail	3						
Shortbelly	8						
Widow							
Other rockfish	1						
Total rockfish	12	-	-	1	-	-	-
Flatfish							
Dover sole							
Rex sole							
Sanddabs				1			
Other flatfish							
Total flatfish	-	-	-	1	-	-	-
Pacific hake	100	2000	4450	1096	9	200	60
Lingcod							
Sablefish							
Other fish	5	3					
Total age 0 fishes	117	2003	4450	1098	9	200	60
Adult fishes							
Pacific hake	7	81	388	306	589	445	203
Northern anchovy							
Pacific herring							
Myctophids					10	40	12
Midshipmen		3					
Invertebrates							
Ctenophores	500	200		200			200
Euphausiids	50			100	1700		
Squid						1	6
Salps	5	5			1		

Table 72. Summary of mid-water trawl catches over Cordell Bank during sweep 1 of May-June 1987.

Station	208	208	209	210	162	162
Month/day	5/30	5/30	5/30	5/30	5/30	5/30
Starting time	0402	0318	0210	0105	2155	2111
Gear depth (m)	10	30	10	10	10	30
Bottom depth (m)	128	128	86	70	1320	1320
Age 0 fishes						
Rockfish						
Bocaccio	1	1	1	1		
Brown						
Canary						1
Chilipepper	8	5	2	1	2	7
Yellowtail					2	7
Shortbelly	9	6	8		46	71
Widow	1	1			1	16
Other rockfish	9	13	14	3	2	21
Total rockfish	28	26	25	5	53	123
Flatfish						
Dover sole						
Rex sole						
Sanddabs			1		4	7
Other flatfish					5	12
Total flatfish	-	-	1	-	9	19
Pacific hake	4		1		46	61
Lingcod						
Sablefish						
Other fish			1		4	1
Total age 0 fishes	32	26	28	5	112	204
Adult fishes						
Pacific hake		1	1	2		1
Northern anchovy						
Pacific herring						
Myctophids					80	475
Midshipmen						
Invertebrates						
Ctenophores						
Euphausiids	2250	7050	12220			
Squid	4			3	16	1
Salps	1058	500	4	5	5000	5000

Table 73. Summary of mid-water trawl catches over Cordell Bank during sweep 2 of May-June 1987.

Station	208	208	209	210	162	162
Month/day	6/7	6/7	6/7	6/7	6/8	6/8
Starting time	2305	2345	2153	2059	0313	0352
Gear depth (m)	10	30	10	10	10	30
Bottom depth (m)	128	128	86	70	1320	1320
Age 0 fishes						
Rockfish						
Bocaccio	1		17			14
Brown						
Canary						9
Chilipepper						1
Yellowtail	2	4	5			1
Shortbelly	14	6	299		3	322
Widow	5	19	10			35
Other rockfish	2	3	7		4	8
Total rockfish	24	32	338	-	7	390
Flatfish						
Dover sole						1
Rex sole			4		3	12
Sanddabs					1	28
Other flatfish			2		11	150
Total flatfish	-	-	6	-	15	191
Pacific hake		11	27		2080	
Lingcod						
Sablefish						
Other fish						
Total age 0 fishes	24	43	371	-	2102	581
Adult fishes						
Pacific hake	278	981	3		4	
Northern anchovy						
Pacific herring						
Myctophids					37	441
Midshipmen						
Invertebrates						
Ctenophores						
Euphausiids			6	19	100	1
Squid			5	1	800	
Salps		2	2		42	19

Table 74. Summary of mid-water trawl catches over Cordell Bank during sweep 3 of May-June 1987.

Station	208	208	209	210	162	162
Month/day	6/20	6/21	6/21	6/21	6/21	6/21
Starting time	2336	0011	0113	0210	0329	0400
Gear depth (m)	10	30	10	10	10	30
Bottom depth (m)	128	128	86	70	1320	1320
Age 0 fishes						
Rockfish						
Bocaccio						1
Brown						
Canary		1				
Chilipepper						
Yellowtail		1				
Shortbelly	1	4	13	8	1	7
Widow		3				
Other rockfish		3	1	2	2	6
Total rockfish	1	12	14	10	3	14
Flatfish						
Dover sole						1
Rex sole	1	4		6	3	6
Sanddabs				1		4
Other flatfish	3	1	1	1	1	10
Total flatfish	4	5	1	8	4	21
Pacific hake	8	87		1		1
Lingcod						
Sablefish						
Other fish						
Total age 0 fishes	13	104	15	19	7	36
Adult fishes						
Pacific hake	96	298	7	8		
Northern anchovy						
Pacific herring						
Myctophids					122	618
Midshipmen						
Invertebrates						
Ctenophores						
Euphausiids	30			50	20	100
Squid	100	150	100	200		100
Salps					3	49

Table 75. Summary of mid-water trawl catches in the Gulf of the Farallones during sweep 1 of May-June 1987.

Station	141	143	137	138	139
Month/day	5/28	5/28	5/28	5/28	5/28
Starting time	2206	2348	0248	0414	2055
Gear depth (m)	10	10	10	10	10
Bottom depth (m)	42	58	58	64	64
Age 0 fishes					
Rockfish					
Bocaccio				1	
Brown			1		
Canary				3	1
Chilipepper	21	17	9	4	3
Yellowtail		1		2	
Shortbelly			164	15	1
Widow			1		
Other rockfish		13	1	2	3
Total rockfish	21	31	176	27	8
Flatfish					
Dover sole					
Rex sole		1			
Sanddabs		36			
Other flatfish		5	1		
Total flatfish	-	42	1	-	-
Pacific hake					
Lingcod	2	5	88	19	5
Sablefish				1	
Other fish	9		10	7	
Total age 0 fishes	32	78	275	54	13
Adult fishes					
Pacific hake					
Northern anchovy					
Pacific herring	1		1		
Myctophids					
Midshipmen	2	1			
Invertebrates					
Ctenophores	1000	500	500	2000	2000
Euphausiids				36000	
Squid	1		1	3	13
Salps			500		

Table 76. Summary of mid-water trawl catches in the Gulf of the Farallones during sweep 2 of May-June 1987.

Station	141	143	137	138	139
Month/day	6/8	6/8	6/9	6/9	6/8
Starting time	2233	2100	0234	0058	2349
Gear depth (m)	10	10	10	10	10
Bottom depth (m)	46	64	60	72	64
Age 0 fishes					
Rockfish					
Bocaccio	6		2		
Brown				2	
Canary	3	1	5	1	
Chilipepper		1	2	1	6
Yellowtail	11				
Shortbelly	234	595		12	96
Widow	1	1	6	3	
Other rockfish	16	1	2	4	
Total rockfish	271	599	17	23	102
Flatfish					
Dover sole					
Rex sole		2			6
Sanddabs			3		
Other flatfish				10	
Total flatfish	-	2	3	10	6
Pacific hake	13		91	35	46376
Lingcod				1	
Sablefish					
Other fish	37	3	5	1	12
Total age 0 fishes	321	604	116	70	46496
Adult fishes					
Pacific hake		35	21	3	6
Northern anchovy				3	
Pacific herring			1		
Myctophids					
Midshipmen	1		6	41	6
Invertebrates					
Ctenophores	150	2100	100		
Euphausiids		1500		63000	
Squid	40	2	840	25	146
Salps					

Table 77. Summary of mid-water trawl catches in the Gulf of the Farallones during sweep 3 of May-June 1987.

Station	141	143	137	138	139
Month/day	6/16	6/17	6/16	6/20	6/20
Starting time	0001	0153	2106	0325	0445
Gear depth (m)	10	10	10	10	10
Bottom depth (m)	46	60	60	66	64
Age 0 fishes					
Rockfish					
Bocaccio		1			1
Brown		1		1	
Canary		4		2	
Chilipepper	3	9			
Yellowtail		3		2	
Shortbelly	1	5	3	2	1
Widow		1		1	1
Other rockfish		1		1	
Total rockfish	4	25	3	9	3
Flatfish					
Dover sole					
Rex sole		15		6	1
Sanddabs				8	1
Other flatfish	1	2	1	6	2
Total flatfish	1	17	1	20	4
Pacific hake	45	15	16	89	15
Lingcod	1		1		
Sablefish	1		1		
Other fish	3	2	1		1
Total age 0 fishes	55	59	23	118	23
Adult fishes					
Pacific hake	2	2	6	6	20
Northern anchovy					
Pacific herring		11			
Myctophids					
Midshipmen	1	2			
Invertebrates					
Ctenophores	200	2000	500		2000
Euphausiids		900	4000	84000	18000
Squid				16	18
Salps					

Table 78. Summary of mid-water trawl catches off the Farallon Islands during sweep 1 of May-June 1987.

Station	156	160	152	152	152	154
Month/day	5/31	5/30	6/1	5/31	5/31	5/31
Starting time	0136	2332	2220	0407	2127	0243
Gear depth (m)	30	30	10	30	100	30
Bottom depth (m)	72	100	116	116	116	1500
Age 0 fishes						
Rockfish						
Bocaccio				1		
Brown						
Canary	2					
Chilipepper	1		1	1	2	1
Yellowtail						
Shortbelly	2	1	3	5		109
Widow				5	6	14
Other rockfish	5	2	3	3	16	14
Total rockfish	10	3	7	15	24	138
Flatfish						
Dover sole			1	3	1	2
Rex sole			4	10		5
Sanddabs	4		4	28	4	26
Other flatfish	23		84	83	489	87
Total flatfish	27	-	93	124	494	120
Pacific hake	8	1		1		422
Lingcod						
Sablefish						
Other fish						1
Total age 0 fishes	45	4	100	140	518	681
Adult fishes						
Pacific hake		2			2	
Northern anchovy						
Pacific herring						
Myctophids						1044
Midshipmen					4	
Invertebrates						
Ctenophores	3150			1260	200	500
Euphausiids	2327			7200	200	
Squid				4		16
Salps	70	1		3		

Table 79. Summary of mid-water trawl catches off the Farallon Islands during sweep 2 of May-June 1987.

Station	156	160	152	152	154
Month/day	6/10	6/8	6/10	6/11	6/10
Starting time	2107	0133	0004	0044	2228
Gear depth (m)	30	30	10	30	30
Bottom depth (m)	70	90	116	116	1500
Age 0 fishes					
Rockfish					
Bocaccio		4	16	3	1
Brown			1		
Canary		4	1	1	1
Chilipepper	5				
Yellowtail		1	4		1
Shortbelly		13	26	12	8
Widow	5		1	2	
Other rockfish		4	1	2	
Total rockfish	10	26	50	20	11
Flatfish					
Dover sole					
Rex sole	1		5	20	7
Sanddabs	3		9	7	2
Other flatfish	1	1	39	17	16
Total flatfish	5	1	53	44	25
Pacific hake	7	2	6	2	245
Lingcod					
Sablefish					
Other fish					
Total age 0 fishes	22	29	109	66	281
Adult fishes					
Pacific hake	2	202			
Northern anchovy					
Pacific herring					
Myctophids					256
Midshipmen					
Invertebrates					
Ctenophores	700	200			200
Euphausiids	3000	400	1500	6000	1250
Squid					38
Salps		12	56	1	4

Table 80. Summary of mid-water trawl catches off the Farallon Islands during sweep 3 of May-June 1987.

Station	156	152	152	152	154
Month/day	6/19	6/20	6/20	6/20	6/19
Starting time	2120	0051	0123	0203	2310
Gear depth (m)	30	10	30	100	30
Bottom depth (m)	70	116	116	116	1500
Age 0 fishes					
Rockfish					
Bocaccio					13
Brown					
Canary	4				3
Chilipepper		1			2
Yellowtail		1			
Shortbelly	4	14	1	1	220
Widow	4				
Other rockfish		2		2	4
Total rockfish	12	18	1	3	242
Flatfish					
Dover sole					1
Rex sole		4	1	6	6
Sanddabs					2
Other flatfish		5	3	9	45
Total flatfish	-	9	4	15	54
Pacific hake		1		16	16
Lingcod					
Sablefish					
Other fish			1		1
Total age 0 fishes	12	28	6	34	313
Adult fishes					
Pacific hake	975	11	439	136	8
Northern anchovy					
Pacific herring					
Myctophids					2133
Midshipmen					
Invertebrates					
Ctenophores		12			
Euphausiids		10000	800	1800	1100
Squid		6			435
Salps		2	2		17

Table 81. Summary of mid-water trawl catches over the Pioneer Seamount during sweep 2 of May-June 1987.

Station	211	211	211	213	213	213	214	214	214
Month/day	6/12	6/12	6/12	6/11	6/11	6/11	6/11	6/11	6/11
Starting time	0212	0255	0342	2339	0019	0104	2111	2150	2235
Gear depth (m)	10	30	100	10	30	100	10	30	100
Bottom depth (m)	2200	2200	2200	1236	1236	1236	3000	3000	3000
Age 0 fishes									
Rockfish									
Bocaccio	1	1				1	4	1	
Brown		1							
Canary						2		1	
Chilipepper						1			
Yellowtail						1			2
Shortbelly	13	4	11	1	26	29	6	23	8
Widow			3			7	1		10
Other rockfish	2	1				2			2
Total rockfish	16	7	14	1	26	43	11	25	22
Flatfish									
Dover sole	1								
Rex sole	50	19	22	1	12	15	6	1	9
Sanddabs	26	11	10		20	5	1	2	4
Other flatfish	145	74	92		34	19	2	16	9
Total flatfish	222	104	124	1	66	39	9	19	22
Pacific hake	18	17	8		77	30	72	1500	148
Lingcod									
Sablefish									
Other fish						1			
Total age 0 fishes	256	128	146	2	169	113	92	1544	192
Adult fishes									
Pacific hake									
Northern anchovy									
Pacific herring									
Myctophids	158	204	352	51	282	643	63	202	715
Midshipmen									
Invertebrates									
Ctenophores		1100		3000	2000	400	700		
Euphausiids	50	300	480	700	1700	1500	600	400	700
Squid	14	9	11	9	24	51	2	26	26
Salps	163	6		60	50		106	63	

Table 82. Summary of mid-water trawl catches off Pescadero during sweep 1 of May-June 1987.

Station	130	131	132	133	133	133	134
Month/day	5/26	5/26	5/27	5/27	5/27	5/27	5/27
Starting time	2057	0141	0053	2155	0426	2101	2315
Gear depth (m)	10	30	30	10	30	100	30
Bottom depth (m)	56	98	106	204	204	600	60
Age 0 fishes							
Rockfish							
Bocaccio	2					1	
Brown							
Canary			1				2
Chilipepper		1		1		1	3
Yellowtail							
Shortbelly	194	9	6	54		2	21
Widow	2	1		3	1	16	
Other rockfish	3	2	8	5	5	18	5
Total rockfish	201	13	15	63	6	38	31
Flatfish							
Dover sole							
Rex sole				1	2		
Sanddabs			1		5	2	9
Other flatfish		19	23	2	14	24	39
Total flatfish	-	19	24	3	21	26	48
Pacific hake		2	1	880	177	382	660
Lingcod							
Sablefish							
Other fish	2	8	26	15	19		4
Total age 0 fishes	203	42	66	961	223	446	743
Adult fishes							
Pacific hake	1	4		1		4	
Northern anchovy	15	20	12		1		
Pacific herring							
Myctophids							248
Midshipmen		21	52		6		
Invertebrates							
Ctenophores	1000	1000	500	500	200	200	
Euphausiids				2000	50	200	
Squid		575	23	23	3	3	12
Salps	256		3	2	50	5	56

Table 83. Summary of mid-water trawl catches off Pescadero during sweep 2 of May-June 1987.

Station	130	131	132	133	133	133	134
Month/day	6/5	6/5	6/5	6/6	6/6	6/6	6/6
Starting time	2105	2200	2320	0036	0114	0156	0425
Gear depth (m)	10	30	30	10	30	100	30
Bottom depth (m)	94	108	198	584	-584	584	60
Age 0 fishes							
Rockfish							
Bocaccio				14	1	3	
Brown							
Canary				1	1		1
Chilipepper		2					
Yellowtail	4	3					1
Shortbelly	176	91		114	39	110	9
Widow	20	6		5	3	17	10
Other rockfish		14		7	5	4	6
Total rockfish	200	116	-	141	49	134	27
Flatfish							
Dover sole					1	2	
Rex sole			3	7	2	2	3
Sanddabs			1	5	1		6
Other flatfish			9	61	31	16	18
Total flatfish	-	-	13	73	35	20	27
Pacific hake	32560	102	7	51	68	64	3
Lingcod							
Sablefish							
Other fish	205	13	1				2
Total age 0 fishes	32965	231	21	265	152	218	59
Adult fishes							
Pacific hake		11				16	
Northern anchovy							
Pacific herring							
Myctophids							398
Midshipmen		8					
Invertebrates							
Ctenophores		1500	200		100		
Euphausiids			2625	900	1000	500	11000
Squid	21224	128		20	3		17
Salps		17		83	26		

Table 84. Summary of mid-water trawl catches off Pescadero during sweep 3 of May-June 1987.

Station	130	131	132	133	133	133	134
Month/day	6/15	6/15	6/15	6/16	6/16	6/16	6/16
Starting time	2102	2150	2252	0020	0051	0131	0320
Gear depth (m)	10	30	30	10	30	100	10
Bottom depth (m)	96	108	198	576	576	576	60
Age 0 fishes							
Rockfish							
Bocaccio					1	1	
Brown							
Canary						1	
Chilipepper							
Yellowtail			4		1		1
Shortbelly				1	21	7	
Widow							
Other rockfish				8	4	7	2
Total rockfish	-	-	4	9	27	16	3
Flatfish							
Dover sole							
Rex sole			4		2	3	12
Sanddabs			8	2		3	3
Other flatfish			4	8	34	35	8
Total flatfish	-	-	16	10	36	41	23
Other fish							
Pacific hake			8		3	3	
Lingcod		2					
Sablefish		1					
Other fish			2				1
Total age 0 fishes	-	3	30	19	66	60	27
Adult fishes							
Pacific hake	40	49	12				
Northern anchovy	4000						
Pacific herring							
Myctophids							25
Midshipmen		3	22				
Invertebrates							
Ctenophores			200	20		50	500
Euphausiids		2000	300	100	30	40	
Squid	8440	5				1	78
Salps		1	6	9	5	5	14

Table 85. Summary of mid-water trawl catches off Davenport during sweep 1 of May-June 1987.

Station	122	123	124	126	125	125
Month/day	5/24	5/24	5/24	5/25	5/26	5/26
Starting time	2115	2209	2344	0317	0015	0111
Gear depth (m)	10	30	30	30	10	30
Bottom depth (m)	58	86	132	412	580	580
Age 0 fishes						
Rockfish						
Bocaccio	3			1	3	25
Brown						
Canary				1		
Chilipepper	46		1		2	
Yellowtail	2				4	1
Shortbelly	9	5	8	3	28	55
Widow	7	2	1		4	8
Other rockfish	16	4	23	3	30	367
Total rockfish	83	11	33	8	71	456
Flatfish						
Dover sole			1	1		
Rex sole						
Sanddabs	2	5	3	12	22	16
Other flatfish		200	42	22	53	31
Total flatfish	2	205	46	35	75	47
Pacific hake				157	44	334
Lingcod						
Sablefish						
Other fish	5	3			1	17
Total age 0 fishes	90	219	79	200	191	854
Adult fishes						
Pacific hake						
Northern anchovy	16	93	50			
Pacific herring						
Myctophids				17	4	
Midshipmen	1	10	4		3	
Invertebrates						
Ctenophores	100			200	100	
Euphausiids	50			200	15	
Squid	300	80	22	11	45	700
Salps	20	6	3	6		51

Table 86. Summary of mid-water trawl catches off Davenport during sweep 2 of May-June 1987.

Station	122	123	124	126	125	125	125
Month/day	6/3	6/3	6/3	6/2	6/2	6/2	6/2
Starting time	0358	0256	0209	2108	2304	2220	2349
Gear depth (m)	10	30	30	10	10	30	100
Bottom depth (m)	42	180	130	430	500	542	542
Age 0 fishes							
Rockfish							
Bocaccio			3	1		3	
Brown				1			
Canary				2			
Chilipepper	17		1	2		2	2
Yellowtail	2	1				1	
Shortbelly	185	158	225	72	112	460	17
Widow	27	29	15	2		18	6
Other rockfish	6	9	15	1	14	4	5
Total rockfish	237	197	259	81	126	488	30
Flatfish							
Dover sole							
Rex sole				7			
Sanddabs		5		44		2	1
Other flatfish		7	12	73		7	10
Total flatfish	-	12	12	124	-	9	11
Pacific hake		2	30	126	28	16	31
Lingcod	3						
Sablefish		2					
Other fish	3	3				1	
Total age 0 fishes	243	216	301	331	154	514	72
Adult fishes							
Pacific hake		5	15		1	15	51
Northern anchovy	200	370	2346		6370	1434	264
Pacific herring							
Myctophids				253			
Midshipmen		9	3				
Invertebrates							
Ctenophores		1000	1800		100		50
Euphausiids		100			750		62
Squid	1000	259	225		11	6	
Salps	50	16	9		32	66	1

Table 87. Summary of mid-water trawl catches off Davenport during sweep 3 of May-June 1987.

Station	122	123	124	126	125	125	125
Month/day	6/12	6/12	6/12	6/13	6/12	6/12	6/13
Starting time	2058	2140	2240	0228	2315	2345	0034
Gear depth (m)	30	30	30	30	10	30	100
Bottom depth (m)	- 40	94	132	408	480	492	480

Age 0 fishes

Rockfish

Bocaccio							
Brown							
Canary						1	1
Chilipepper							
Yellowtail	1						
Shortbelly		1	2	49			
Widow				2			
Other rockfish				3			
Total rockfish	1	1	2	54	-	1	1

Flatfish

Dover sole							
Rex sole				5			2
Sanddabs				2			9
Other flatfish		1	5	5		4	242
Total flatfish	-	1	5	12	-	4	253

Pacific hake		4	14	76	98	417	129
Lingcod							
Sablefish							
Other fish			1		1		1

Total age 0 fishes	1	6	22	142	99	422	384
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Adult fishes

Pacific hake			1	5	1	8	30
Northern anchovy				7	2	6	5
Pacific herring							
Myctophids				6			6
Midshipmen		2	1			1	

Invertebrates

Ctenophores			350		75	375	1000
Euphausiids			250	17500	1500	1500	2500
Squid	5300	6		6	18	3	5
Salps						1	15

Table 88. Summary of mid-water trawl catches inside Monterey Bay during sweep 1 of May-June 1987.

Station	111	114	119	115	116
Month/day	5/24	5/24	5/23	5/24	5/24
Starting time	0459	0105	2335	0343	0238
Gear depth (m)	10	30	30	30	30
Bottom depth (m)	44	82	94	100	380
Age 0 fishes					
Rockfish					
Bocaccio	4	1			
Brown	1				
Canary					
Chilipepper	2	1		2	
Yellowtail	2				
Shortbelly	1	4	3	4	
Widow	3	9		10	1
Other rockfish	8	108	17	19	16
Total rockfish	21	123	20	35	17
Flatfish					
Dover sole		1			
Rex sole		1			
Sanddabs		12	33	2	41
Other flatfish		52	90	6	56
Total flatfish	-	66	123	8	97
Pacific hake			3		21
Lingcod	1				
Sablefish					
Other fish		1	3		4
Total age 0 fishes	22	190	149	43	139
Adult fishes					
Pacific hake		1	1		
Northern anchovy	6	250	53	1	2
Pacific herring	2				
Myctophids					91
Midshipmen			12	3	
Invertebrates					
Ctenophores		50	100		100
Euphausiids	200	100	200	22200	50
Squid	3	53	81	15	36
Salps	50	24	24	10	28

Table 89. Summary of mid-water trawl catches inside Monterey Bay during sweep 2 of May-June 1987.

Station	111	114	119	112	112	115	116
Month/day	6/4	6/3	6/3	6/4	6/4	6/3	6/3
Starting time	0121	2159	2050	0205	0246	0004	2317
Gear depth (m)	10	30	30	10	30	30	30
Bottom depth (m)	44	90	100	98	98	100	380
Age 0 fishes							
Rockfish							
Bocaccio	3			8			1
Brown	1						
Canary					1		1
Chilipepper	75			238	93	19	52
Yellowtail				3	2		1
Shortbelly	416		212	184	31	484	7
Widow			4	28	4	3	9
Other rockfish	1		8	30	30	4	5
Total rockfish	496	-	224	491	161	510	76
Flatfish							
Dover sole							
Rex sole							
Sanddabs			8		1	2	
Other flatfish	1	35			5	48	73
Total flatfish	1	35	8	-	6	50	73
Pacific hake			372		1	34	305
Lingcod							
Sablefish							
Other fish	21			8	2	10	1
Total age 0 fishes	518	35	604	499	170	604	455
Adult fishes							
Pacific hake	1	385	152		15	18	20
Northern anchovy	5	3710	96	1			
Pacific herring	4				1	1	
Myctophids							6
Midshipmen				1	30		
Invertebrates							
Ctenophores	50		100	65	65		500
Euphausiids			96	1000	700	1400	3000
Squid	91		11568	465	57	140	267
Salps			8			3	13

Table 90. Summary of mid-water trawl catches inside Monterey Bay during sweep 3 of May-June 1987.

Station	111	114	119	112	112	115	116
Month/day	6/14	6/14	6/13	6/14	6/14	6/14	6/13
Starting time	0132	2214	2105	0132	0313	0020	2320
Gear depth (m)	10	30	30	10	30	30	30
Bottom depth (m)	44	90	100	98	98	100	380
Age 0 fishes							
Rockfish							
Bocaccio	5				2		
Brown							
Canary							
Chilipepper	2	5		3	30	2	5
Yellowtail				1	4		
Shortbelly	200			9	2	5	1
Widow	1			3			
Other rockfish					4		
Total rockfish	208	5	-	16	42	7	6
Flatfish							
Dover sole		1				1	
Rex sole							
Sanddabs	4		1		2		
Other flatfish		1			2		
Total flatfish	4	2	1	-	4	1	-
Pacific hake		53	99			17	357
Lingcod							
Sablefish							
Other fish	5	1		5	3	1	1
Total age 0 fishes	217	61	100	21	49	26	364
Adult fishes							
Pacific hake		12	6	1	7		123
Northern anchovy	2						
Pacific herring							
Myctophids							
Midshipmen	3						
Invertebrates							
Ctenophores	250		100	50		200	50
Euphausiids					400		100
Squid	12	290	38	15	14	27	13
Salps			2	3	1		

Table 91. Summary of mid-water trawl catches outside Monterey Bay during sweep 1 of May-June 1987.

Station	109	113	118	117	110	110	110
Month/day	5/26	5/25	5/25	5/25	5/26	5/26	5/26
Starting time	0030	2325	2057	2203	0337	0200	0251
Gear depth (m)	30	30	30	30	10	30	100
Bottom depth (m)	700	1000	1100	2000	2450	2450	2450
Age 0 fishes							
Rockfish							
Bocaccio		5	1			7	
Brown							1
Canary							
Chilipepper	9	6	17	18	13	52	7
Yellowtail		1					1
Shortbelly	122	308	243	538	78	338	51
Widow	2	17	8	31			126
Other rockfish	11	47	9	12	13	22	94
Total rockfish	144	384	278	599	104	419	280
Flatfish							
Dover sole							
Rex sole			2			1	1
Sanddabs	4	9	240	29	13	16	8
Other flatfish	17	81	717	147	65	168	58
Total flatfish	21	90	959	176	78	185	67
Pacific hake	6084	6000	55000	2268	2015	2688	1522
Lingcod							
Sablefish							
Other fish	1	17		1		4	2
Total age 0 fishes	6250	6491	56237	3044	2197	3296	1871
Adult fishes							
Pacific hake							
Northern anchovy							
Pacific herring							
Myctophids	187	393	198	1000	26	844	450
Midshipmen							
Invertebrates							
Ctenophores				200			
Euphausiids							
Squid	19	178	130	144	559	112	39
Salps			38	12	156	5	7

Table 92. Summary of mid-water trawl catches outside Monterey Bay during sweep 2 of May-June 1987.

Station	109	113	118	117	110	110	110
Month/day	6/4	6/4	6/5	6/5	6/4	6/4	6/4
Starting time	2352	0053	0253	0145	2054	2129	2207
Gear depth (m)	30	30	30	30	10	30	100
Bottom depth (m)	770	900	1048	2080	2300	2300	2300
Age 0 fishes							
Rockfish							
Bocaccio		1			3	3	
Brown						1	
Canary							
Chilipepper							
Yellowtail	1				4		
Shortbelly	2	11	1	2	93	22	2
Widow		2			29	6	
Other rockfish	1	1		3	144	4	3
Total rockfish	4	15	1	5	273	36	5
Flatfish							
Dover sole							
Rex sole						5	1
Sanddabs	1		2	5			16
Other flatfish	2	3	1	6		39	
Total flatfish	3	3	3	11	-	44	17
Pacific hake	250	170	600	240	87	80	28
Lingcod							
Sablefish	2						
Other fish	3	1				1	
Total age 0 fishes	262	189	604	256	360	161	50
Adult fishes							
Pacific hake	1	1	37	2		15	19
Northern anchovy			8				
Pacific herring							
Myctophids	200	602	331	232	378	420	656
Midshipmen							
Invertebrates							
Ctenophores	195	50	1980	2445	500	400	
Euphausiids	1300	400	946	600	923	1050	1000
Squid	7	23	6	27	118	272	112
Salps	5			7		220	18

Table 93. Summary of mid-water trawl catches outside Monterey Bay during sweep 3 of May-June 1987.

Station	109	113	118	117	110	110	110
Month/day	6/15	6/15	6/15	6/15	6/14	6/14	6/14
Starting time	0014	0118	0324	0208	2106	2137	2217
Gear depth (m)	30	30	30	30	10	30	100
Bottom depth (m)	700	928	1100	2050	2600	2600	2600
Age 0 fishes							
Rockfish							
Bocaccio	2	1	2		1		1
Brown		1					
Canary							
Chilipepper							
Yellowtail							
Shortbelly	59	23	4	2	2	3	5
Widow							
Other rockfish	6	4	2	1			1
Total rockfish	67	29	8	3	3	3	7
Flatfish							
Dover sole							
Rex sole	12	18	3	3	1	2	1
Sanddabs	8	5				1	
Other flatfish	13	24	8	2	6	11	4
Total flatfish	33	47	11	5	7	14	5
Pacific hake	140	114	39	15	11	726	112
Lingcod							
Sablefish					2		
Other fish		30			1		
Total age 0 fishes	240	220	58	23	24	743	124
Adult fishes							
Pacific hake				7			
Northern anchovy							
Pacific herring							
Myctophids	68	185	97	49	282	196	813
Midshipmen							
Invertebrates							
Ctenophores	1000	500	2000	700	500		
Euphausiids	50	9000	850	2000	15000	2800	2300
Squid	13	20	13	8	29	18	21
Salps	1	7		12	36	10	94

Table 94. Species composition of 1983-1985 catches of pelagic juvenile rockfish arranged in order of abundance.

1983 Mid-water trawl			1984 Mid-water trawl		
Species	Number	Percent	Species	Number	Percent
Shortbelly	90	86.54	Shortbelly	1523	61.68
Yellowtail	8	7.69	Bocaccio	388	15.71
Widow	4	3.85	Yellowtail	154	6.24
Unidentified	2	1.92	Canary	100	4.05
			Widow	85	3.44
			Chilipepper	63	2.55
			Squarespot	55	2.23
			Brown	43	1.74
			Unidentified	16	0.65
			Stripetail	13	0.53
			Halfbanded	9	0.36
			Blue	6	0.24
			Darkblotched	6	0.24
			Black	5	0.20
			Pygmy	3	0.12

1984 Bottom trawl			1985 Mid-water trawl		
Species	Number	Percent	Species	Number	Percent
Stripetail	202	76.23	Widow	492	40.13
Darkblotched	17	6.42	Shortbelly	475	38.74
Squarespot	12	4.53	Yellowtail	129	10.52
Canary	10	3.77	Blue	75	6.12
Halfbanded	7	2.64	Squarespot	22	1.79
Splitnose	5	1.89	Unidentified	18	1.47
Shortbelly	3	1.13	Canary	6	0.49
Yellowtail	3	1.13	Stripetail	3	0.24
Pygmy	2	0.75	Cowcod	2	0.16
Bocaccio	1	0.38	Olive	2	0.16
Brown	1	0.38	Black	1	0.08
Starry	1	0.38	Bocaccio	1	0.08
Unidentified	1	0.38	Pygmy	1	0.08

Table 95. Species composition of 1986 catches of pelagic juvenile rockfish arranged in order of abundance.

1986 Mid-water trawl Sweep 1			1986 Mid-water trawl Sweep 2		
Species	Number	Percent	Species	Number	Percent
Shortbelly	23203	95.80	Shortbelly	2390	88.91
Bocaccio	455	1.88	Brown	189	7.03
Brown	273	1.13	Bocaccio	53	1.97
Chilipepper	63	0.26	Chilipepper	22	0.82
Widow	47	0.19	Canary	11	0.41
Canary	46	0.19	Yellowtail	10	0.37
Unidentified	36	0.15	Copper complex	8	0.30
Yellowtail	33	0.14	Unidentified	2	0.07
Rosy complex	18	0.07	Widow	2	0.07
Pygmy	14	0.06	Squarespot	1	0.04
Black	13	0.05			
Blue	5	0.02			
Squarespot	3	0.01			
Quillback	2	0.01			
Stripetail	2	0.01			
Copper complex	1	0.00			
Cowcod	1	0.00			
Grass	1	0.00			
Halfbanded	1	0.00			
Splitnose	1	0.00			
Tiger	1	0.00			

1986 Mid-water trawl Sweep 3		
Species	Number	Percent
Shortbelly	112	74.67
Brown	25	16.67
Chilipepper	5	3.33
Bocaccio	4	2.67
Yellowtail	3	2.00
Canary	1	0.67

Table 96. Species composition of 1987 catches of pelagic juvenile rockfish arranged in order of abundance.

April 1987 Mid-water trawl Sweep 1			May-June 1987 Mid-water trawl Sweep 1		
Species	Number	Percent	Species	Number	Percent
Chilipepper	2237	50.84	Shortbelly	2541	59.70
Shortbelly	1785	40.57	Squarespot	516	12.12
Bocaccio	103	2.34	Widow	311	7.31
Stripetail	59	1.34	Chilipepper	297	6.98
Canary	42	0.95	Blue	217	5.10
Copper complex	37	0.84	Stripetail	210	4.93
Widow	37	0.84	Bocaccio	60	1.41
Pygmy	22	0.50	Yellowtail	23	0.54
Brown	20	0.45	Bank	14	0.33
Squarespot	20	0.45	Canary	14	0.33
Darkblotched	12	0.27	Pygmy	12	0.28
Blue	9	0.20	Cowcod	10	0.23
Splitnose	6	0.14	Halfbanded	8	0.19
Grass	4	0.09	Black	6	0.14
Cowcod	2	0.05	Darkblotched	5	0.12
Unidentified	2	0.05	Brown	3	0.07
Vermillion	2	0.05	Olive	3	0.07
Yellowtail	1	0.02	Splitnose	3	0.07
			Copper complex	1	0.02
			Grass	1	0.02
			Rosy complex	1	0.02
			Vermillion	1	0.02

May-June 1987 Mid-water trawl Sweep 2			May-June 1987 Mid-water trawl Sweep 3		
Species	Number	Percent	Species	Number	Percent
Shortbelly	5123	75.63	Shortbelly	690	75.82
Chilipepper	520	7.68	Chilipepper	62	6.81
Widow	425	6.27	Bocaccio	32	3.52
Blue	196	2.89	Yellowtail	22	2.42
Bocaccio	117	1.73	Canary	18	1.98
Squarespot	114	1.68	Rosy complex	16	1.76
Bank	80	1.18	Widow	16	1.76
Yellowtail	74	1.09	Copper complex	10	1.10
Canary	50	0.74	Cowcod	9	0.99
Stripetail	18	0.27	Black	8	0.88
Black	14	0.21	Greenstriped	4	0.44
Cowcod	12	0.18	Brown	3	0.33
Pygmy	8	0.12	Pygmy	3	0.33
Brown	7	0.10	Squarespot	3	0.33
Olive	6	0.09	China	2	0.22
Halfbanded	4	0.06	Darkblotched	2	0.22
Darkblotched	3	0.04	Splitnose	2	0.22
Copper complex	1	0.01	Stripetail	2	0.22
Quillback	1	0.01	Vermillion	2	0.22
Splitnose	1	0.01	Bank	1	0.11
			Blue	1	0.11
			Halfbanded	1	0.11
			Olive	1	0.11

Table 97. Number of pelagic juvenile rockfish otoliths collected in 1983-1987.

Species	1983	1984	1985	1986	April 1987	May-June 1987
Shortbelly	74	186	59	345	102	305
Bocaccio		145	17	184	50	98
Chilipepper		2	29	40	99	133
Squarespot		1	21		5	74
Stripetail		43	8		18	38
Widow			68	9	8	218
Yellowtail			43	9	1	69
Brown			23	89	7	6
Canary			5	34	34	59
Blue			39	5	2	159
Total	74	377	312	715	326	1159

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