

State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

SOUTHERN CALIFORNIA MARINE SPORT FISHING FROM
PRIVATELY OWNED BOATS: CATCH AND EFFORT
FOR OCTOBER-DECEMBER 1982

by

David S. Ono
and
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MARINE RESOURCES
Administration Report No. 86-2

1986

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ABSTRACT

The catch landed and effort expended by private-boat sport fishermen were studied in southern California marine waters between October and December 1982, to determine the impact of one segment of the sport fishery on local marine resources. Fishermen returning from fishing trips were interviewed at launch ramps, hoists, and boat-rental facilities. This report contains quantitative data and statistical estimates of total effort, total catch, catch of preferred species, and length frequencies for those species whose catches are regulated by minimum size limits.

An estimated 157,000 organisms were landed by 57,700 anglers and 4800 divers. The major components of the angler catch were Pacific mackerel, Scomber japonicus (28,700 estimated catch); white croaker, Genyonemus lineatus (24,000 estimated catch); and Pacific bonito, Sarda chiliensis (16,700 estimated catch). These three species represented almost half the total estimated angler catch. Rockfishes, Sebastes spp; were a major catch component; the 35 rockfish species landed made up 24% of the estimated catch. Divers landed an estimated 14,700 fishes and invertebrates. Chief among these were abalone, Haliotis spp. (4200 estimated catch); rock scallop, Hinnites rugosus (3600 estimated catch); and California spiny lobster, Panulirus interruptus (2500 estimated catch).

Angler and diver compliance with size-limit regulations was generally favorable, with diver compliance being particularly scrupulous, especially with invertebrate species. The compliance rate for California halibut, Paralichthys californicus, showed a drop from the previous quarter (July - September 1982) from 70 to 59% legal. During the same time period, size-limit compliance rose from 4 to 20% for Pacific bonito, a species with a tolerance allowing the take of some under-sized fish.

^{1/} Marine Resources Administration Report No. 86-2.

^{2/} Marine Resources Division, 4025 State Street #32,
Santa Barbara, California, 93110.

^{3/} Marine Resources Division, 1301 W. 12th Street, Long Beach,
California, 90813.

ACKNOWLEDGMENT

This work was performed as part of Dingell-Johnson Project F-35-R, the Southern California Marine Sportfish Monitoring Program, which was supported in part by Federal Aid to Fish Restoration Funds.

INTRODUCTION

Recreational fishing activity in southern California marine waters affects the abundance of local fish populations and also influences migratory fish populations. To determine the extent of these fishing activities, the Department of Fish and Game studied one segment of the recreational fishery: fishermen using privately owned, trailerable boats.

The major purposes of the study were to estimate effort levels expended by anglers and divers, to estimate the magnitude and species composition of the catch by these fishermen, and to assess the degree of compliance with size limit regulations.

The information generated by this study provides: 1) a baseline for future comparison of catch and effort trends; 2) evidence for adding, deleting, or changing fishing regulations; 3) an indication of the magnitude of fishing pressure on various species; and 4) supportive material for other agencies to use when assessing proposed actions which could affect southern California's marine resources. The results of the study focus attention on areas in which management may be necessary.

OPERATIONS

Sampling Plan

The sampling plan consisted of a program of random field sampling at selected launch ramps, hoists, and boat-rental facilities in southern California. Sampling was conducted on all weekends and holidays, and on randomly chosen weekdays in accordance with available staff levels. Field samplers remained at sample locations from 1000 to 1800 h, and an attempt was made to interview all returning anglers and divers. Information on length of angling trip, number of hours spent diving, numbers of fishing

poles used, and number of people was gathered along with the identification and enumeration of all fishes, mollusks, and crustaceans in possession. Instances of fishing parties which did not keep their catch were noted, but no attempt was made to identify or quantify those fishes returned to the ocean. All species with minimum size limit requirements were measured for subsequent length frequency analysis.

Sampling Locations

Five coastal counties were covered in the survey: Santa Barbara, Ventura, Los Angeles, Orange, and San Diego. Three sampling sites were located in Santa Barbara County, three sites in Ventura County, seven sites in Los Angeles County, six sites in Orange County, and eight sites in San Diego County.

Statistical Analysis

Data were averaged on a daily basis for each county, then expanded to estimate the total catch or effort for each county, each month. Catch estimates were made for each species which had a legal minimum size limit, for the 18 most commonly landed species, for the rockfishes (Sebastes spp.) and for the total number of fishes landed. Estimates were calculated separately for weekends and weekdays.

RESULTS AND DISCUSSION

Data Samples

During the October 1 - December 31, 1982 quarter, 19 launch ramps, five boat hoists, and four boat-rental locations were sampled 309 times. Samplers interviewed 13,323 anglers and 1146 divers who spent 84,861 angler trip hours^{4/} and 1704 diver hours^{5/} in southern California coastal waters. Samplers identified 32,491 fishes, mollusks, crustaceans, and other invertebrates representing 123 species in the angler catch, along with 64

unidentified fishes, 1263 filleted fishes, and 34 unidentified invertebrates (Tables 1 and 2). In the sampled diver catch, 3965 organisms along with 2 unidentified rockfish, 19 unidentified fish and 56 unidentified invertebrates were examined.

Effort

An estimated 57,700 angler days were expended by southern California sport fishermen between October 1 and December 31, 1982 (Tables 3 and 4). This represented a slight (6%) increase over angler effort expended during the same period last year. Each county, individually, experienced an increase in angling effort over 1981, except Los Angeles County, which had an 11% drop in angler days over that time period. Los Angeles still held the largest (35%) share of angling effort among the five counties surveyed.

An estimated 4781 diver days were expended in southern California during the October-December, 1982 quarter (Tables 5 and 6). This represented a 5% drop in diving effort over the corresponding quarter in 1981. Each county actually experienced a slight to moderate increase in diving effort, except Los Angeles County, which showed a 33% decrease in diving effort between the last quarter 1981 and 1982. San Diego County, with 1749 diver days, had the greatest portion of diving effort among the five counties.

Catch

An estimated total of 142,266 fishes and other organisms was landed by private boat anglers in southern California during the October-December 1982 quarter. This represented a 26% drop in landings from the same quarter in 1981.

^{4/} The unit of effort is one hour of trip-time per angler. Adjustments are made for those using more than one fishing pole concurrently.

^{5/} The unit of dive effort is one hour spent underwater.

Three species were prominent in the angler catch: Pacific mackerel, Scomber japonicus, 28,750 landed; white croaker, Genyonemus lineatus, 24,000 landed; and Pacific bonito, Sarda chiliensis, 16,650 landed. These three species, in varying rankings, have dominated the angler catch with regularity for the last two years. During this quarter, their combined estimated landings represented 49% of the total angler catch. Among preferred or favored game fishes, the three basses, kelp bass, Paralabrax clathratus; barred sand bass, P. nebulifer; and spotted sand bass, P. maculatofasciatus, at a combined total landing of 12,385, represented 9% of the angler catch. An estimated 33,840 rockfishes, Sebastes spp. were landed by anglers; or approximately 24% of the angler catch. Among the 35 species of rockfish sampled, bocaccio, Sebastes paucispinus; greenspotted rockfish, S. chlorostictus; blue rockfish, S. mystinus; and copper rockfish S. caurinus, were the most prominently represented species.

The southern California diver catch was composed of an estimated 14,730 organisms (Tables 5 and 6). The three leading species in the diver catch included rock scallop, Hinnites multirugosus, 3600 landed; red abalone, Haliotis rufescens, 3190 landed; and California spiny lobster, Panulirus interruptus, 2540 landed. These three species represented over 60% of the estimated diver catch. As in the last three quarters of 1982, California sheephead, Semicossyphus pulcher, was the top finfish species speared by divers; an estimated 1280 sheephead were landed this quarter.

Variation by County

Private-boat anglers in Santa Barbara and Ventura Counties landed an estimated 31,300 fishes, or about 22% of the southern California angler catch. As in the past, rockfishes dominated this area's landings; the 12,980 rockfishes landed in Santa Barbara/Ventura represented 42% of the

total catch. Blue, copper, vermilion (Sebastes miniatus), and greenspotted rockfishes were among the most frequently encountered rockfish species. White croaker was the leading species in the catch, comprising 21% of the landings. Other significant species in the Santa Barbara/Ventura County angler catch included Pacific mackerel, Pacific bonito and kelp bass (Table 7). Divers landed an estimated 6680 organisms in Santa Barbara/Ventura. Rock scallop was the leading species landed, followed by spiny lobster, and red abalone. Combined, these three species represented 65% of the diver catch.

Los Angeles County anglers landed 54,520 fishes, or 38% of the estimated southern California private-boat catch. The catch was clearly dominated by two species: white croaker and Pacific mackerel. The combined estimated landing of these two species equaled half the Los Angeles County angler catch. Among the other major catch species, Pacific bonito, halfmoon (Medialuna californiensis), and sculpin (Scorpaena guttata), were landed with the greatest frequency. Divers in Los Angeles County landed an estimated 2475 organisms. Chief among these were rock scallop and spiny lobster. These two species represented 55% of the county's diver catch. Much of the mainland coast of Los Angeles County continued to be closed to the take of abalone, resulting in the low catch totals for all species of abalone in the county.

Orange County anglers landed 19,960 fishes, or 14% of the southern California angler catch. Bonito and Pacific mackerel were the leading catch species, with a combined total equal to 49% of the Orange County angler catch. The estimated 1580 white croaker landed made it the third most important catch species. Divers in Orange County landed 1830 organisms. Rock scallop was the leading catch species, representing 55% of the Orange

County diver catch. Abalone landings were the lowest among the five counties surveyed, probably a result of the same coastal abalone closure that impacted Los Angeles County.

San Diego private-boat anglers landed an estimated 36,480 fishes. Pacific mackerel was the leading catch species, followed by bonito, and barred sand bass. These three species represented 45% of the county's angler catch. Other leading species in the catch included white croaker, sculpin, Pacific sanddab (Citharichthys sordidus), spotted sand bass, and sheephead. Rockfishes were fairly important in the angler catch, comprising 25%. San Diego County divers landed 3750 organisms. One species, red abalone, dominated the catch making up over 52% of the diver landings. This was also the case in October-December, 1981, when red abalone comprised 54% of the diver catch.

Length Frequencies

The length frequency data (Table 8, Figures 1-4) show that the size-limit compliance for the three Paralabrax bass species combined averaged 87%. This was 3-4% lower than the compliance rate for the first three quarters of 1982. It was, however, very close to the 88% compliance rate for the same (Oct.-Dec. 1981) quarter last year. This may indicate that fewer legal size bass remain in the fished populations toward the end of each year, resulting in a larger percentage of sublegal fish being caught and kept. The size-limit compliance rate of 59% for California halibut represented an 11% drop from the 77% compliance rate during the previous, July-September, 1982 quarter. When compared to the 1981 Oct.-Dec. quarter, a 6% decline in size-limit compliance is seen (from 65%). Looking at the California halibut length frequency histogram (Figure 3), there were at least two modal length groups between 38 cm and 50 cm (15 to 20 in).

Apparently, there were numbers of large, but sublegal halibut in the sport fishery, and anglers were reluctant to release them, despite the minimum size limit. The compliance rate for Pacific bonito rose from 7% during the previous, July-Sept., quarter to 20%. These percentages were not an entirely accurate measure of angler compliance with size limits, since a tolerance for under-size bonito was provided for in the current sportfishing regulations. No attempt was made by samplers to determine how many of the sub-legal bonito measured were part of legal limits. Looking at the bonito length frequency histogram (Figure 2), three distinct age classes were indicated by modal peaks; these modal groups represented young-of-the-year, one-year-old, and two-year-old bonito. The diver size-limit compliance rate for abalone and spiny lobster, respectively 94% and 97%, was representative of the high level of diver compliance with invertebrate size limits seen during the first three quarters of this year. As observed in previous quarters, sport divers, as a group, seemed to be more familiar with the regulations that govern their sport and tended to follow them more closely than sport fishermen.

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TABLE 1. List of Species Sampled from Southern California Private Boats October through December 1982.

Scientific name	Common name	No. sampled
<u>Fishes</u>		
<i>Albula vulpes</i>	bonefish	1
<i>Alopias vulpinus</i>	common thresher	2
<i>Amphistichus argenteus</i>	barred surfperch	16
<i>A. koelzi</i>	calico surfperch	2
<i>Anisotremus davidsonii</i>	sargo	32
<i>Anoplopoma fimbria</i>	sablefish	24
<i>Atherinops affinis</i>	topsmelt	10
<i>Atherinopsis californiensis</i>	jacksmelt	142
<i>Atractoscion nobilis</i>	white seabass	51
<i>Balistes polylepis</i>	finescale triggerfish	5
<i>Caulolatilus princeps</i>	ocean whitefish	346
<i>Cephaloscyllium ventriosum</i>	swell shark	1
<i>Cheilotrema saturnum</i>	black croaker	21
<i>Chromis punctipinnis</i>	blacksmith	21
<i>Citharichthys sordidus</i>	Pacific sanddab	562
<i>C. xanthostigma</i>	longfin sanddab	2
<i>Damalichthys vacca</i>	pile surfperch	20
<i>Decapterus hypodus</i>	Mexican scad	1
<i>Embiotoca jacksoni</i>	black surfperch	446
<i>E. lateralis</i>	striped surfperch	13
<i>Eopsetta jordani</i>	petrale sole	23
<i>Galeorhinus zyopterus</i>	soupfin shark	2
<i>Genyonemus lineatus</i>	white croaker	5284
<i>Gibbonsia metzi</i>	striped kelpfish	1
<i>Girella nigricans</i>	opaleye	593
<i>Halichoeres semicinctus</i>	rock wrasse	21
<i>Heterostichus rostratus</i>	giant kelpfish	29
<i>Hexagrammos decagrammus</i>	kelp greenling	2
<i>Hippoglossina stomata</i>	bigmouth sole	4
<i>Hippoglossoides elassodon</i>	flathead sole	1
<i>Hydrolagus colliei</i>	ratfish	2
<i>Hyperprosopon argenteum</i>	walleye surfperch	8
<i>H. ellipticum</i>	silver surfperch	4
<i>Hypsopsetta guttulata</i>	diamond turbot	76
<i>Hypsurus caryi</i>	rainbow surfperch	31
<i>Isurus oxyrinchus</i>	bonito shark	8
<i>Lepidopsetta bilineata</i>	rock sole	2
<i>Leptocottus armatus</i>	staghorn sculpin	1
<i>Makaira nigricans</i>	blue marlin	1
<i>Medialuna californiensis</i>	halfmoon	835
<i>Menticirrhus undulatus</i>	California corbina	6
<i>Merluccius productus</i>	Pacific whiting	34
<i>Mustelus californicus</i>	gray smoothhound	59
<i>M. henlei</i>	brown smoothhound	28

Table 1 - cont'd.

Scientific name	Common name	No. sampled
<i>Myliobatis californica</i>	bat ray	11
<i>Ophiodon elongatus</i>	lingcod	41
<i>Oxyjulis californica</i>	senorita	65
<i>Paralabrax clathratus</i>	kelp bass	1044
<i>P. maculatofasciatus</i>	spotted sand bass	297
<i>P. nebulifer</i>	barred sand bass	1134
<i>Paralichthys californicus</i>	California halibut	143
<i>Peprilus simillimus</i>	Pacific butterfish	2
<i>Phanerodon atripes</i>	sharpnose surfperch	14
<i>P. furcatus</i>	white surfperch	130
<i>Platyrrhinoidis triseriata</i>	thornback	4
<i>Pleuronichthys decurrens</i>	curlfin turbot	2
<i>P. ritteri</i>	spotted turbot	1
<i>P. verticalis</i>	hornyhead turbot	1
<i>Porichthys myriaster</i>	specklefin midshipman	1
<i>Prionace glauca</i>	blue shark	29
<i>Prionotus stephanophrys</i>	lumptail searobin	1
<i>Rhacochilus toxotes</i>	rubberlip surfperch	84
<i>Rhinobatos productus</i>	shovelnose guitarfish	33
<i>Roccus saxatilis</i>	striped bass	2
<i>Roncador stearnsii</i>	spotfin croaker	10
<i>Sarda chliensis</i>	Pacific bonito	4222
<i>Sardinops sagax caeruleus</i>	Pacific sardine	7
<i>Scomber japonicus</i>	Pacific mackerel	7239
<i>Scorpaena guttata</i>	sculpin	979
<i>Scorpaenichthys marmoratus</i>	cabezon	101
<i>Sebastes atrovirens</i>	kelp rockfish	146
<i>S. auriculatus</i>	brown rockfish	172
<i>S. carnatus</i>	gopher rockfish	64
<i>S. caurinus</i>	copper rockfish	639
<i>S. chlorostictus</i>	greenspotted rockfish	834
<i>S. chrysomelas</i>	black and yellow rockfish	18
<i>S. constellatus</i>	starry rockfish	364
<i>S. dallii</i>	calico rockfish	4
<i>S. diploproa</i>	splitnose rockfish	1
<i>S. elongatus</i>	greenstriped rockfish	236
<i>S. ensifer</i>	swordspine rockfish	18
<i>S. entomelas</i>	widow rockfish	34
<i>S. eos</i>	pink rockfish	7
<i>S. flavidus</i>	yellowtail rockfish	35
<i>S. gilli</i>	bronzespotted rockfish	1
<i>S. goodei</i>	chilipepper	220
<i>S. hopkinsi</i>	squarespot rockfish	62
<i>S. levis</i>	cowcod	44
<i>S. mcdonaldi</i>	Mexican rockfish	3
<i>S. miniatus</i>	vermilion rockfish	388
<i>S. mystinus</i>	blue rockfish	778
<i>S. ovalis</i>	speckled rockfish	540
<i>S. paucispinis</i>	bocaccio	829

Table 1 - cont'd.

scientific name	Common name	No. sampled
<i>Sebastes pinniger</i>	canary rockfish	8
<i>S. rastrelliger</i>	grass rockfish	195
<i>S. rosaceus</i>	rosy rockfish	164
<i>S. rosenblatti</i>	greenblotched rockfish	25
<i>S. ruberrimus</i>	yelloweye rockfish	2
<i>S. rubrivinctus</i>	flag rockfish	133
<i>S. rufus</i>	bank rockfish	38
<i>S. semicinctus</i>	halfbanded rockfish	6
<i>S. serranoides</i>	olive rockfish	413
<i>S. serriceps</i>	treefish	47
<i>S. umbrosus</i>	honeycomb rockfish	27
<i>S. zacentrus</i>	sharpchin rockfish	4
<i>Semicossyphus pulcher</i>	California sheephead	835
<i>Seriola lalandi</i>	yellowtail	43
<i>Seriphus politus</i>	queenfish	231
<i>Sphyrna argentea</i>	California barracuda	33
<i>Sphyrna zygaena</i>	smooth hammerhead	3
<i>Squalus acanthias</i>	spiny dogfish	66
<i>Squatina californica</i>	Pacific angel shark	3
<i>Stereolepis gigas</i>	giant sea bass	4
<i>Synodus lucioceps</i>	California lizardfish	86
<i>Tetrapturus audax</i>	striped marlin	1
<i>Trachurus symmetricus</i>	jack mackerel	93
<i>Triakis semifasciata</i>	leopard shark	22
<i>Umbrina roncadore</i>	yellowfin croaker	124
<i>Xystreurys liolepis</i>	fantail sole	9
<i>Zapteryx exasperata</i>	banded guitarfish	1
-	unidentified fish	24
-	unidentified filleted fish	685
<i>Sebastes</i> spp.	unidentified rockfish	43
	unidentified rockfish fillets	598

Mollusks and Crustaceans

<i>Cancer antennarius</i>	rock crab	52
<i>Cypraea spadicea</i>	chestnut cowry	1
<i>Haliotis corrugata</i>	pink abalone	143
<i>H. cracherodii</i>	black abalone	63
<i>H. fulgens</i>	green abalone	99
<i>H. rufescens</i>	red abalone	695
<i>H. sorenseni</i>	white abalone	4
<i>Hinnites multirugosus</i>	rock scallop	1240
<i>Kelletia kelletii</i>	Kellet's whelk	9
<i>Loxorhynchus grandis</i>	sheep crab	2
<i>Megathura crenulata</i>	giant keyhole limpet	8

Table 1 - cont'd.

<u>Scientific name</u>	<u>Common name</u>	<u>No. sampled</u>
<i>Panulirus interruptus</i>	California spiny lobster	590
<i>Mytilus</i> spp.	mussel	237
<i>Octopus</i> spp.	unidentified octopus	9
Majidae	unidentified spider crab	7
Brachyura	unidentified crab	3
Mollusca	unidentified mollusk	19
Crustacea	unidentified crustacean	5
<u>Echinoderms and Sponges</u>		
<i>Strongylocentrotus franciscanus</i>	giant red urchin	86
<i>S. purpuratus</i>	purple urchin	4
<i>Pisaster</i> spp.	unidentified sea star	17
Echinodermata	unidentified echinoderm	2
Porifera	unidentified sponge	1

TABLE 2. Most Commonly Landed Species; October through December 1982.

<u>Scientific name</u>	<u>Common name</u>	<u>No. sampled</u>
<u>Fishes</u>		
<i>Scomber japonicus</i>	Pacific mackerel	7239
<i>Genyonemus lineatus</i>	white croaker	5284
<i>Sarda chiliensis</i>	Pacific bonito	4222
<i>Paralabrax nebulifer</i>	barred sand bass	1134
<i>P. clathratus</i>	kelp bass	1044
<i>Scorpaena guttata</i>	sculpin	979
<i>Medialuna californiensis</i>	halfmoon	835
<i>Semicossyphus pulcher</i>	California sheephead	835
<i>Sebastes chlorostictus</i>	greenspotted rockfish	834
<i>S. paucispinis</i>	bocaccio	829
<i>S. mystinus</i>	blue rockfish	778
<i>S. caurinus</i>	copper rockfish	639
<i>Girella nigricans</i>	opaleye	593
<i>Citharichthys sordidus</i>	Pacific sanddab	562
<i>Sebastes ovalis</i>	speckled rockfish	540
<i>Embiotoca jacksoni</i>	black surfperch	446
<i>Sebastes serranoides</i>	olive rockfish	413
<i>S. miniatus</i>	vermilion rockfish	388
<i>S. constellatus</i>	starry rockfish	364
<i>Caulolatilus princeps</i>	ocean whitefish	346
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	297
<i>Sebastes elongatus</i>	greenstriped rockfish	236
<i>Seriphus politus</i>	queenfish	231
<i>Sebastes goodei</i>	chilipepper rockfish	220
<i>S. rastrelliger</i>	grass rockfish	195
<i>S. auriculatus</i>	brown rockfish	172
<i>S. rosaceus</i>	rosy rockfish	164
<i>S. atrovirens</i>	kelp rockfish	146
<i>Paralichthys californicus</i>	California halibut	143
<i>Atherinopsis californiensis</i>	jacksmelt	142
<i>Synodus lucioceps</i>	California lizardfish	135
<i>Sebastes rubrivinctus</i>	flag rockfish	133
<i>Phanerodon furcatus</i>	white surfperch	130
<i>Umbrina roncador</i>	yellowfin croaker	124
<i>Scorpaenichthys marmoratus</i>	cabezon	101
<i>Trachurus symmetricus</i>	jack mackerel	93
<u>Mollusks and Crustaceans</u>		
<i>Hinnites multirugosus</i>	rock scallop	1240
<i>Haliotis rufescens</i>	red abalone	695
<i>Panulirus interruptus</i>	California spiny lobster	582
<i>Haliotis corrugata</i>	pink abalone	143
<i>H. fulgens</i>	green abalone	99

TABLE 3. Catch and Effort Estimates for Anglers; October through December 1982.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Angler parties					
weekend	1991	5465	3222	4340	15 018
weekday	1024	2434	1599	3188	8245
total	<u>3015</u>	<u>7899</u>	<u>4821</u>	<u>7528</u>	<u>23 263</u>
Angler days					
weekend	5418	14 554	8216	10 708	38 896
weekday	2446	5549	3600	7196	18 791
total	<u>7864</u>	<u>20 103</u>	<u>11 816</u>	<u>17 904</u>	<u>57 687</u>
Angler-trip-hours					
weekend	31 119	94 591	52 188	71 169	249 067
weekday	12 723	35 874	23 034	48 254	119 885
total	<u>43 842</u>	<u>130 465</u>	<u>75 222</u>	<u>119 423</u>	<u>368 952</u>
Total fishes landed					
weekend	19 583	41 971	14 908	22 561	99 023
weekday	11 732	12 547	5048	13 916	43 243
total	<u>31 315</u>	<u>54 518</u>	<u>19 956</u>	<u>36 477</u>	<u>142 266</u>
No. rockfishes landed					
weekend	10 105	6402	2477	4656	23 640
weekday	2877	2257	662	4400	10 196
total	<u>12 982</u>	<u>8659</u>	<u>3139</u>	<u>9056</u>	<u>33 836</u>
<i>Atractoscion nobilis</i> (white seabass)					
	3	48	51	72	174
<i>Caulolatilus princeps</i> (ocean whitefish)					
	574	225	38	579	1416
<i>Citharichthys sordidus</i> (Pacific sanddab)					
	362	364	322	1242	2290
<i>Embiotoca jacksoni</i> (black surfperch)					
	87	1037	174	319	1617
<i>Genyonemus lineatus</i> (white croaker)					
	6665	13 997	1577	1773	24 012
<i>Girella nigricans</i> (opaleye)					
	140	1316	454	465	2375

Table 3 - cont'd.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
<i>Medialuna californiensis</i> (halfmoon)	577	2733	425	226	3916
<i>Ophiodon elongatus</i> (lingcod)	81	11	6	12	110
<i>Paralabrax clathratus</i> (kelp bass)	1538	1474	528	600	4140
<i>P. maculatofasciatus</i> (spotted sand bass)	27	55	367	1066	1515
<i>P. nebulifer</i> (barred sand bass)	311	1392	741	4286	6730
<i>Paralichthys californicus</i> (California halibut)	102	319	45	159	625
<i>Sarda chiliensis</i> (Pacific bonito)	1884	4836	5337	4892	16 649
<i>Scomber japonicus</i> (Pacific mackerel)	3324	13 770	4440	7216	28 750
<i>Scorpaena guttata</i> (sculpin)	297	1996	626	2683	5602
<i>Sebastes atrovirens</i> (kelp rockfish)	264	78	2	75	419
<i>S. auriculatus</i> (brown rockfish)	440	55	41	89	625
<i>S. caurinus</i> (copper rockfish)	2057	29	12	80	2178
<i>S. chlorostictus</i> (greenspotted rockfish)	946	772	240	1176	3134
<i>S. goodei</i> (chilipepper)	240	252	189	77	758
<i>S. miniatus</i> (vermillion rockfish)	1000	105	85	433	1623
<i>S. mystinus</i> (blue rockfish)	2288	310	19	296	2913

Table 3 - cont'd.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
<i>Sebastes paucispinus</i> (bocaccio)	549	1605	575	780	3509
<i>S. rastrelliger</i> (grass rockfish)	457	115	77	23	672
<i>S. serranoides</i> (olive rockfish)	831	388	100	310	1629
<i>Semicossyphus pulcher</i> (California sheephead)	246	206	613	1044	2109
<i>Seriola lalandi</i> (yellowtail)	0	100	2	68	170
<i>Seriphus politus</i> (queenfish)	23	467	242	109	841
<i>Sphyræna argentea</i> (California barracuda)	3	74	7	86	170
<i>Trachurus symmetricus</i> (jack mackerel)	84	132	26	60	302

TABLE 4. Standard Error of the Estimates for Anglers: October through December 1982.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Angler parties	246	539	376	1606	2017
Angler days	665	1324	935	3928	5096
Angler-trip-hours	3833	8420	5856	28 802	77 286
Total fishes landed	5042	5134	1746	9897	11 774
No. rockfishes landed	1324	1385	403	3761	2469
white seabass	2	16	22	14	162
ocean whitefish	213	58	12	249	215
Pacific sanddab	155	124	114	467	452
black surfperch	32	287	70	237	181
white croaker	4748	2416	272	402	3913
opaleye	49	365	161	282	663
halfmoon	300	649	133	85	493
lingcod	28	3	2	6	31
kelp bass	310	276	145	173	823
spotted sand bass	20	24	128	338	1010
barred sand bass	105	231	124	2014	2970
California halibut	29	78	10	44	310
Pacific bonito	248	658	785	766	1128
Pacific mackerel	534	1526	555	1577	5683
sculpin	63	289	138	1404	472
kelp rockfish	67	30	1	21	105
brown rockfish	111	19	14	42	457
copper rockfish	419	8	6	36	460
greenspotted rockfish	123	327	56	425	654
chilipepper	68	146	61	32	141
vermilion rockfish	176	44	27	214	333
blue rockfish	379	89	6	207	452
bocaccio	113	349	114	285	424
grass rockfish	102	34	25	8	238
olive rockfish	153	108	42	126	354
California sheephead	76	65	163	348	285
yellowtail	0	33	1	40	178
queenfish	16	127	135	57	550
California barracuda	2	29	3	34	604
jack mackerel	30	43	8	22	114

TABLE 5. Catch and Effort Estimates for Divers; October through December 1982.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Diver parties					
weekend	357	325	222	453	1357
weekday	184	35	93	276	558
total	541	360	315	729	1945
Diver days					
weekend	1003	770	557	1094	3424
weekday	414	103	185	655	1357
total	1417	873	742	1749	4781
Diver-hours					
weekend	1932	1098	757	1146	4933
weekday	881	129	202	1057	2269
total	2813	1227	952	2203	7202
No. organisms landed					
weekend	5155	2146	1569	2894	11 764
weekday	1525	329	257	856	2967
total	6680	2475	1826	3750	14 731
<i>Haliotis corrugata</i>					
(pink abalone)	279	4	2	231	516
<i>H. cracherodii</i>					
(black abalone)	169	39	0	0	208
<i>H. fulgens</i>					
(green abalone)	9	47	76	160	292
<i>H. rufescens</i>					
(red abalone)	1194	42	2	1956	3194
<i>Hinnites multirugosus</i>					
(rock scallop)	1691	741	1008	168	3608
<i>Panulirus interruptus</i>					
(spiny lobster)	1435	627	140	335	2537
<i>Paralabrax clathratus</i>					
(kelp bass)	238	64	45	68	415
<i>Semicossyphus pulcher</i>					
(Calif. sheephead)	382	312	300	290	1284

TABLE 6. Standard Error of the Estimates for Divers; October through December 1982.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Diver parties	65	59	44	167	193
Diver days	189	158	100	433	508
Diver-hours	452	234	126	899	1041
No. organisms landed	1199	496	299	796	1551
pink abalone	63	3	1	76	99
black abalone	64	25	0	0	68
green abalone	6	24	32	69	80
red abalone	422	30	1	428	602
rock scallop	261	188	189	52	376
California spiny lobster	502	273	35	88	579
kelp bass	114	16	17	33	121
California sheephead	107	79	68	89	174

TABLE 7. Ten Most Commonly Landed Species in Each County; October Through December 1982.

County	Rank	Scientific Name	Common name
Santa Barbara/ Ventura	1.	<i>Scomber japonicus</i>	Pacific mackerel
	2.	<i>Genyonemus lineatus</i>	white croaker
	3.	<i>Sebastes mystinus</i>	blue rockfish
	4.	<i>S. caurinus</i>	copper rockfish
	5.	<i>Hinnites multirugosus</i>	rock scallop
	6.	<i>Sarda chiliensis</i>	Pacific bonito
	7.	<i>Paralabrax clathratus</i>	kelp bass
	8.	<i>Panulirus interruptus</i>	spiny lobster
	9.	<i>Sebastes chlorostictus</i>	greenspotted rockfish
	10.	<i>Haliotis rufescens</i>	red abalone
Los Angeles	1.	<i>Genyonemus lineatus</i>	white croaker
	2.	<i>Scomber japonicus</i>	Pacific mackerel
	3.	<i>Sarda chiliensis</i>	Pacific bonito
	4.	<i>Medialuna californiensis</i>	halfmoon
	5.	<i>Scorpaena guttata</i>	sculpin
	6.	<i>Paralabrax clathratus</i>	kelp bass
	7.	<i>Sebastes paucispinis</i>	bocaccio
	8.	<i>Embiotoca jacksoni</i>	black surfperch
	9.	<i>Girella nigricans</i>	opaleye
	10.	<i>Paralabrax nebulifer</i>	barred sand bass
Orange	1.	<i>Scomber japonicus</i>	Pacific mackerel
	2.	<i>Sarda chiliensis</i>	Pacific bonito
	3.	<i>Genyonemus lineatus</i>	white croaker
	4.	<i>Hinnites multirugosus</i>	rock scallop
	5.	<i>Semicossyphus pulcher</i>	California sheephead
	6.	<i>Paralabrax nebulifer</i>	barred sand bass
	7.	<i>Sebastes paucispinis</i>	bocaccio
	8.	<i>Scorpaena guttata</i>	sculpin
	9.	<i>Citharichthys sordidus</i>	Pacific sanddab
	10.	<i>Paralabrax clathratus</i>	kelp bass
San Diego	1.	<i>Scomber japonicus</i>	Pacific mackerel
	2.	<i>Sarda chiliensis</i>	Pacific bonito
	3.	<i>Paralabrax nebulifer</i>	barred sand bass
	4.	<i>Haliotis rufescens</i>	red abalone
	5.	<i>Genyonemus lineatus</i>	white croaker
	6.	<i>Scorpaena guttata</i>	sculpin
	7.	<i>Citharichthys sordidus</i>	Pacific sanddab
	8.	<i>Sebastes chlorostictus</i>	greenspotted rockfish
	9.	<i>Semicossyphus pulcher</i>	California sheephead
	10.	<i>Paralabrax maculatofasciatus</i>	spotted sand bass

TABLE 8. Occurrence of Sublegal-Size Fishes in Examined Catches; October through December 1982.

<u>Scientific name</u>	<u>Common name</u>	<u>No. examined</u>	<u>Percent legal</u>
<u>Fishes</u>			
<u>Paralabrax clathratus</u>	kelp bass	869	83
<u>P. maculatofascatus</u>	spotted sand bass	193	87
<u>P. nebulifer</u>	barred sand bass	881	90
<u>Paralichthys californicus</u>	California halibut	133	59
<u>Sarda chiliensis</u>	Pacific bonito	2355	20*
<u>Mollusks and Crustaceans</u>			
<u>Haliotis corrugata</u>	pink abalone	141	91
<u>H. rufescens</u>	red abalone	609	97
<u>Panulirus interruptus</u>	California spiny lobster	540	97

(* Current regulations allow five bonito per angler below the minimum size limit.)

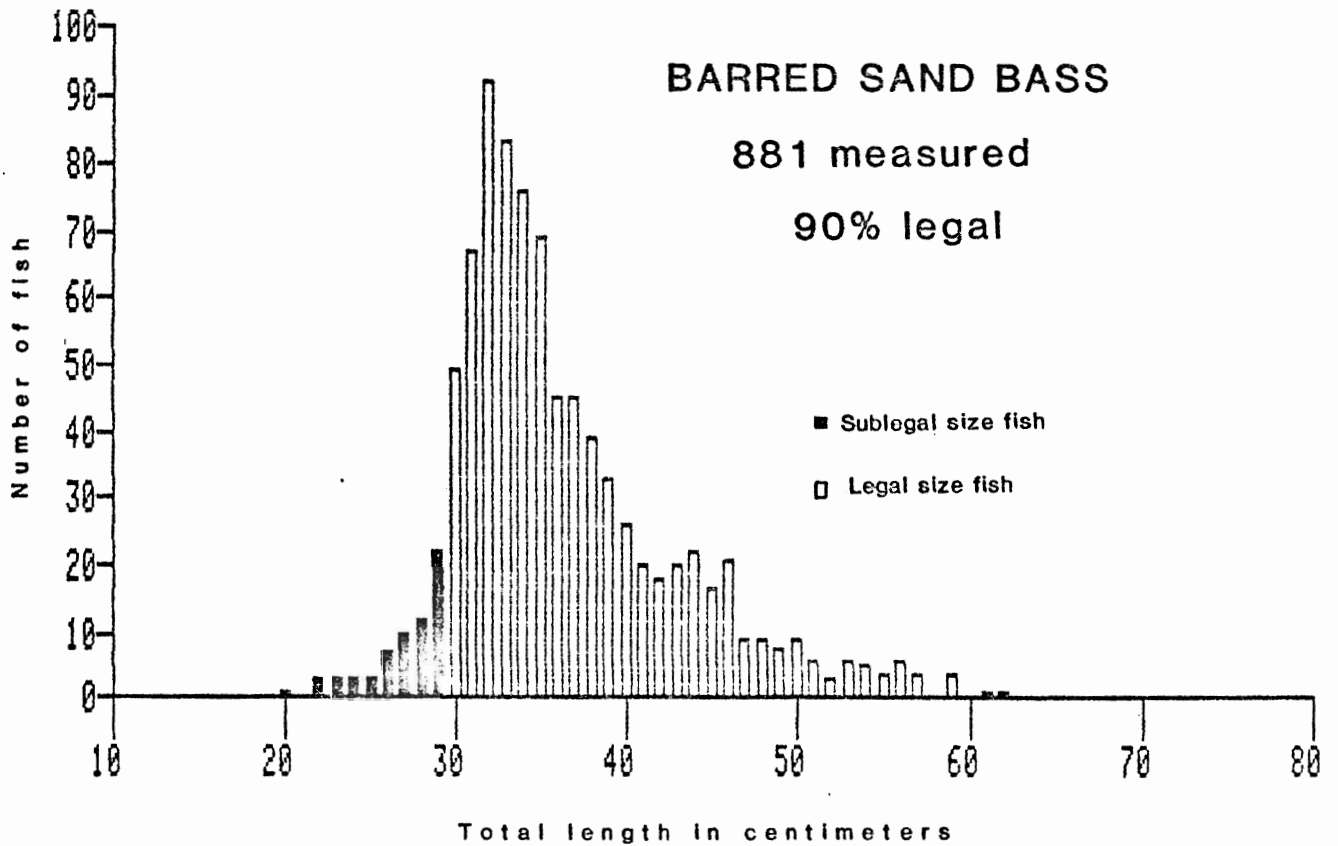
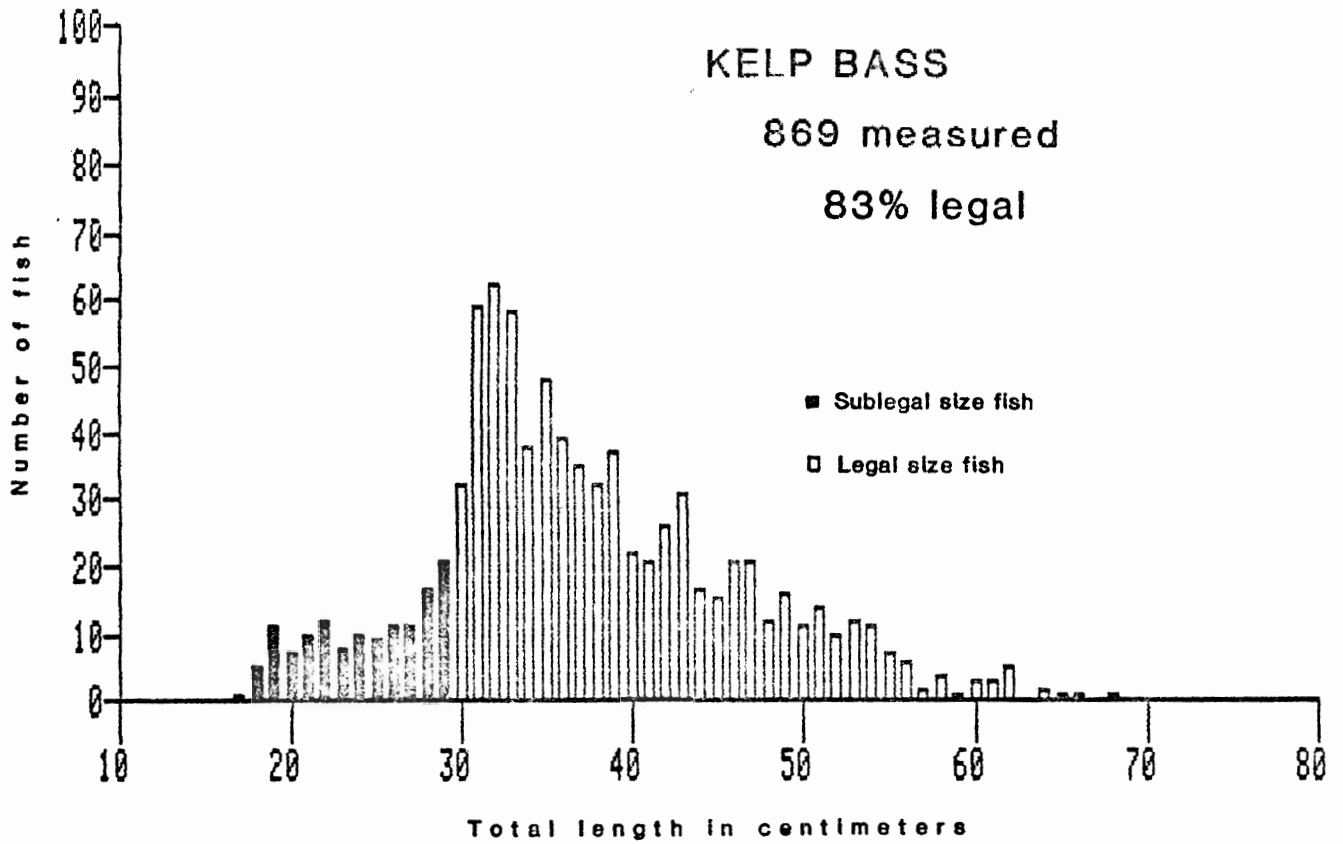


FIGURE 1. Length frequencies of kelp bass and barred sand bass.

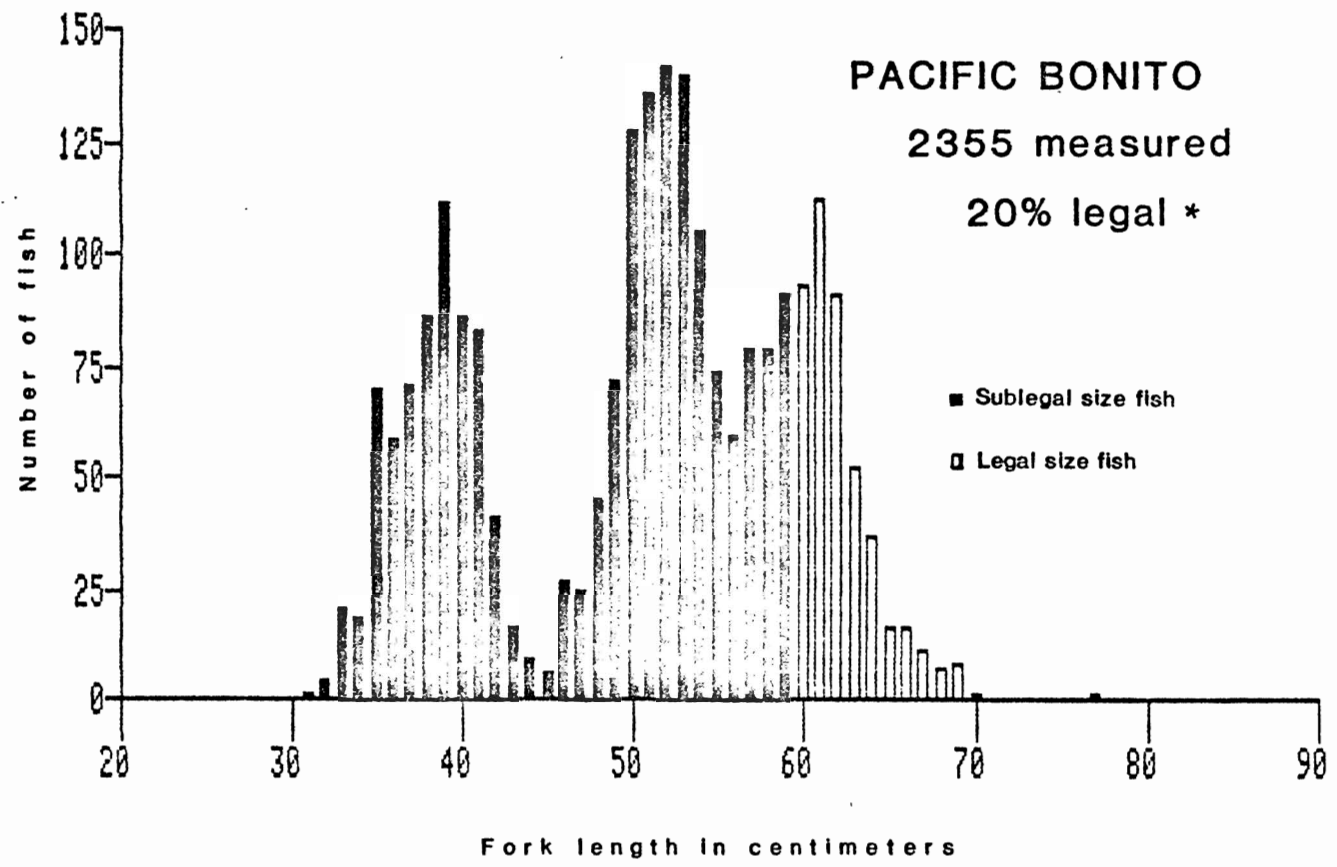
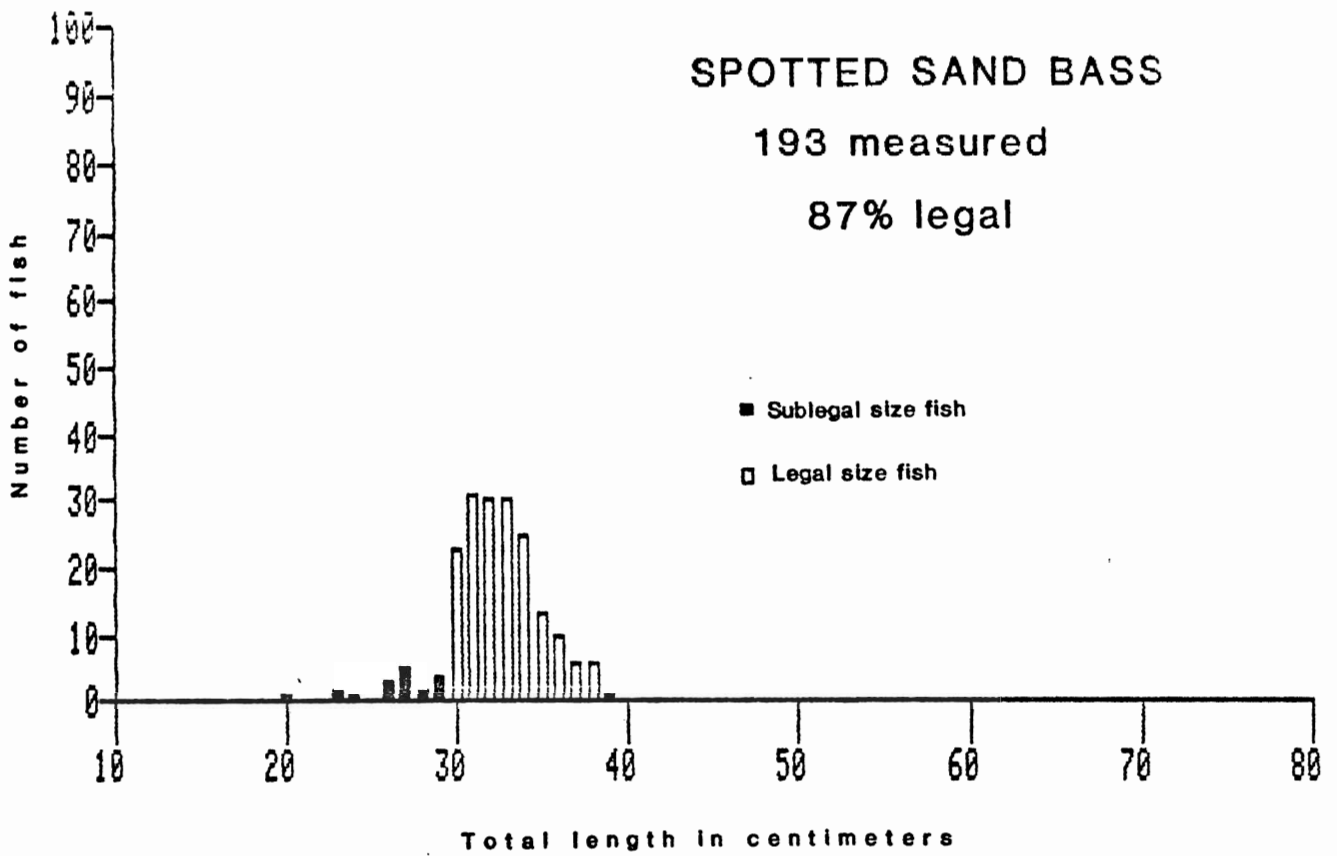


FIGURE 2. Length frequencies of spotted sand bass and Pacific bonito.

(* Current regulations allow five bonito per angler below the minimum size limit.)

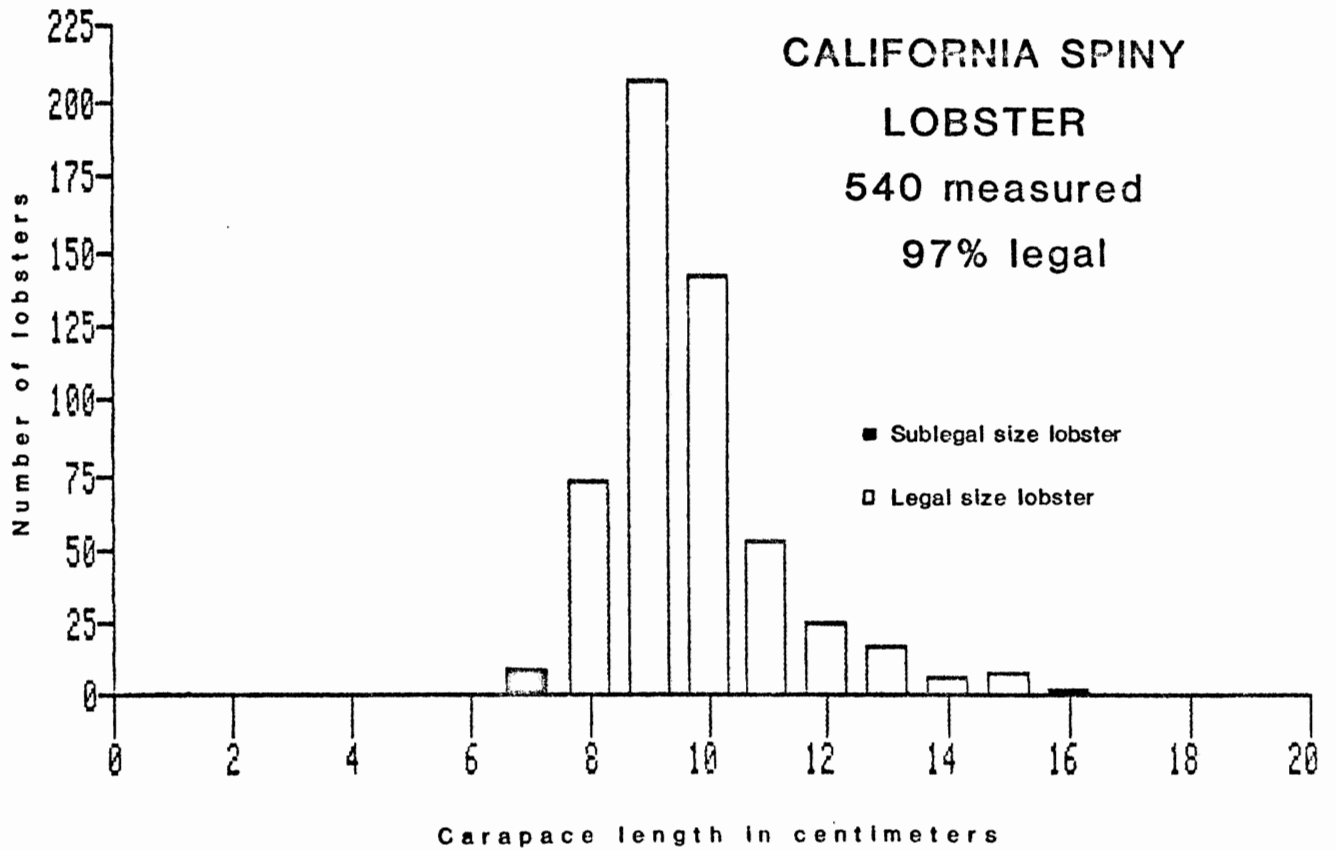
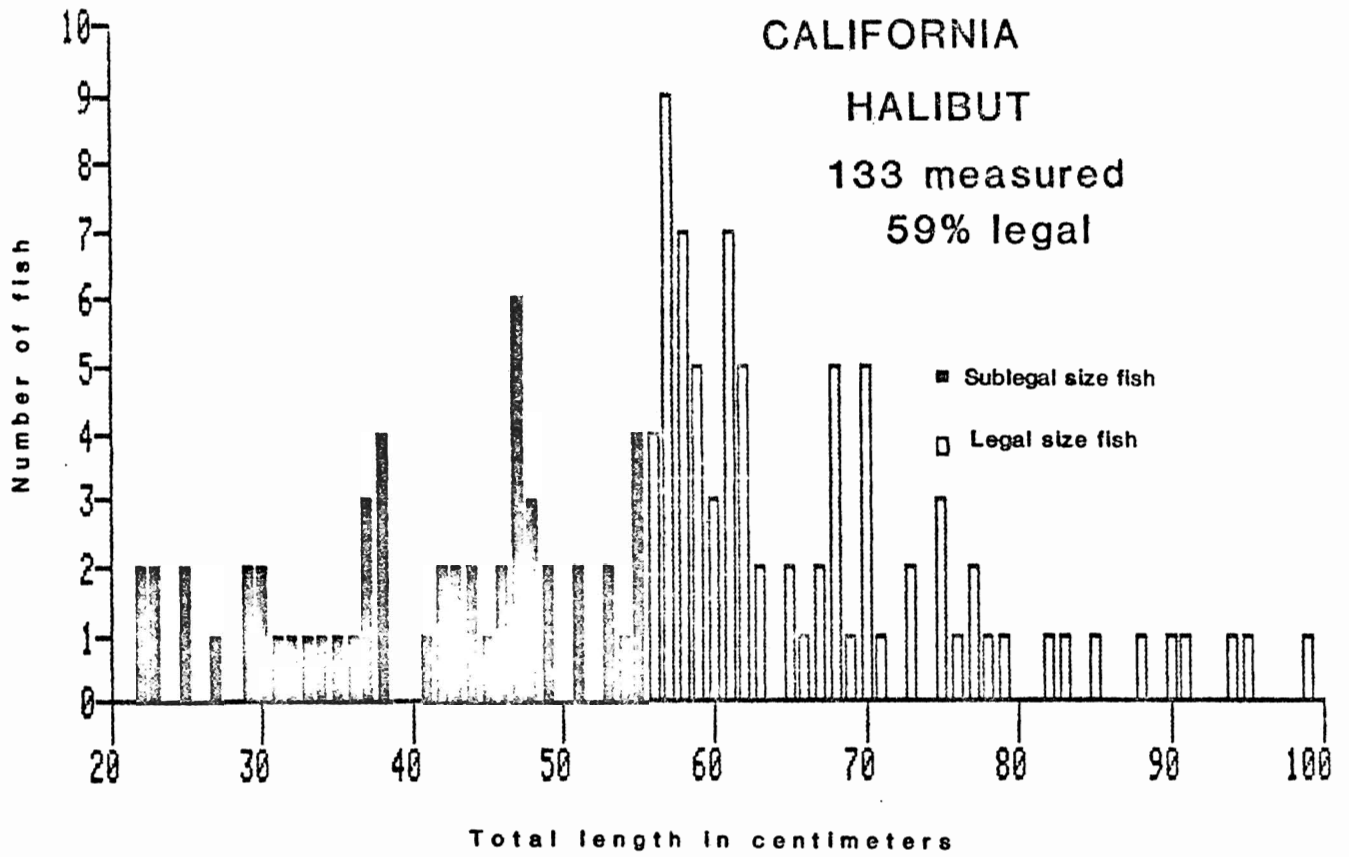


FIGURE 3. Length frequencies of California halibut and California spiny lobster.

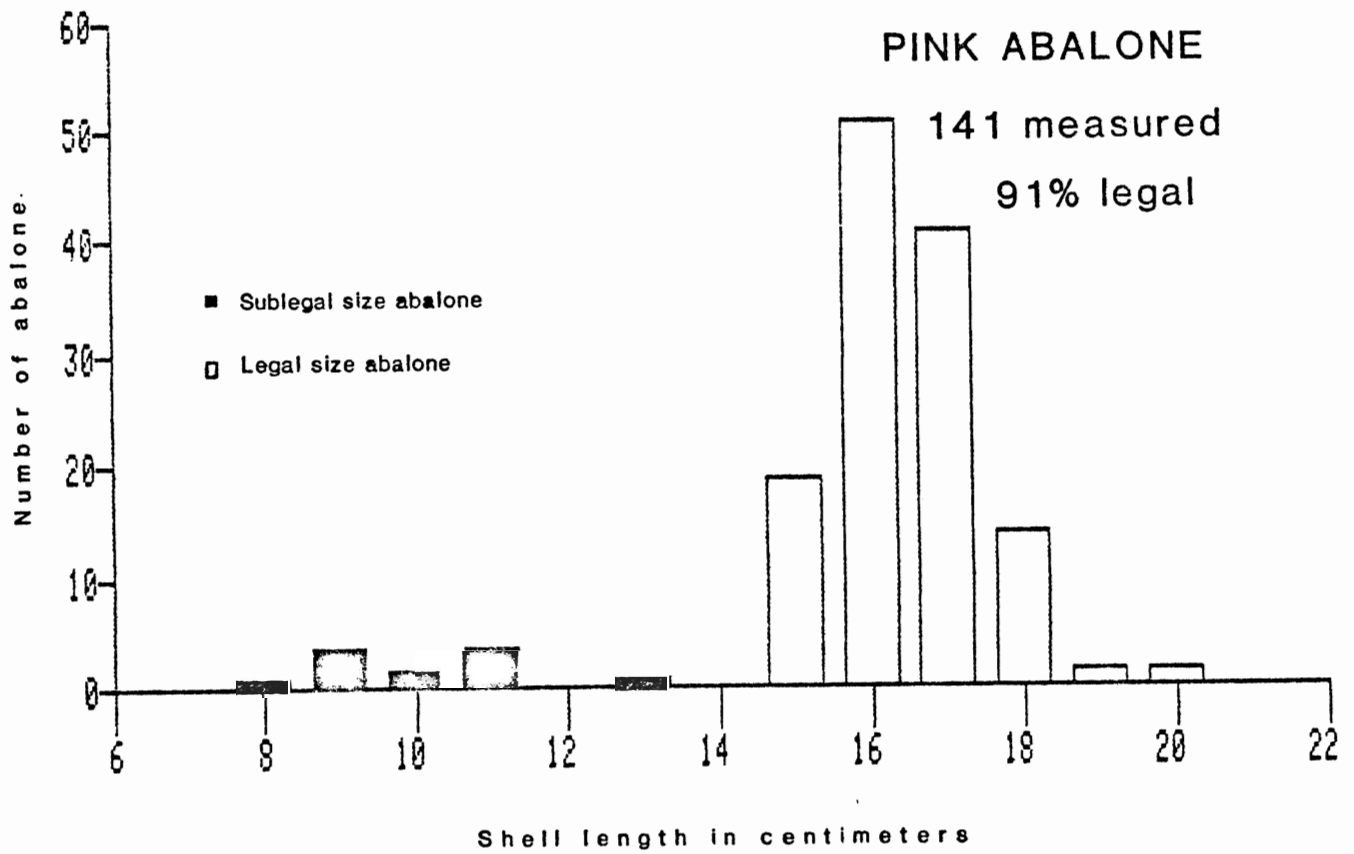
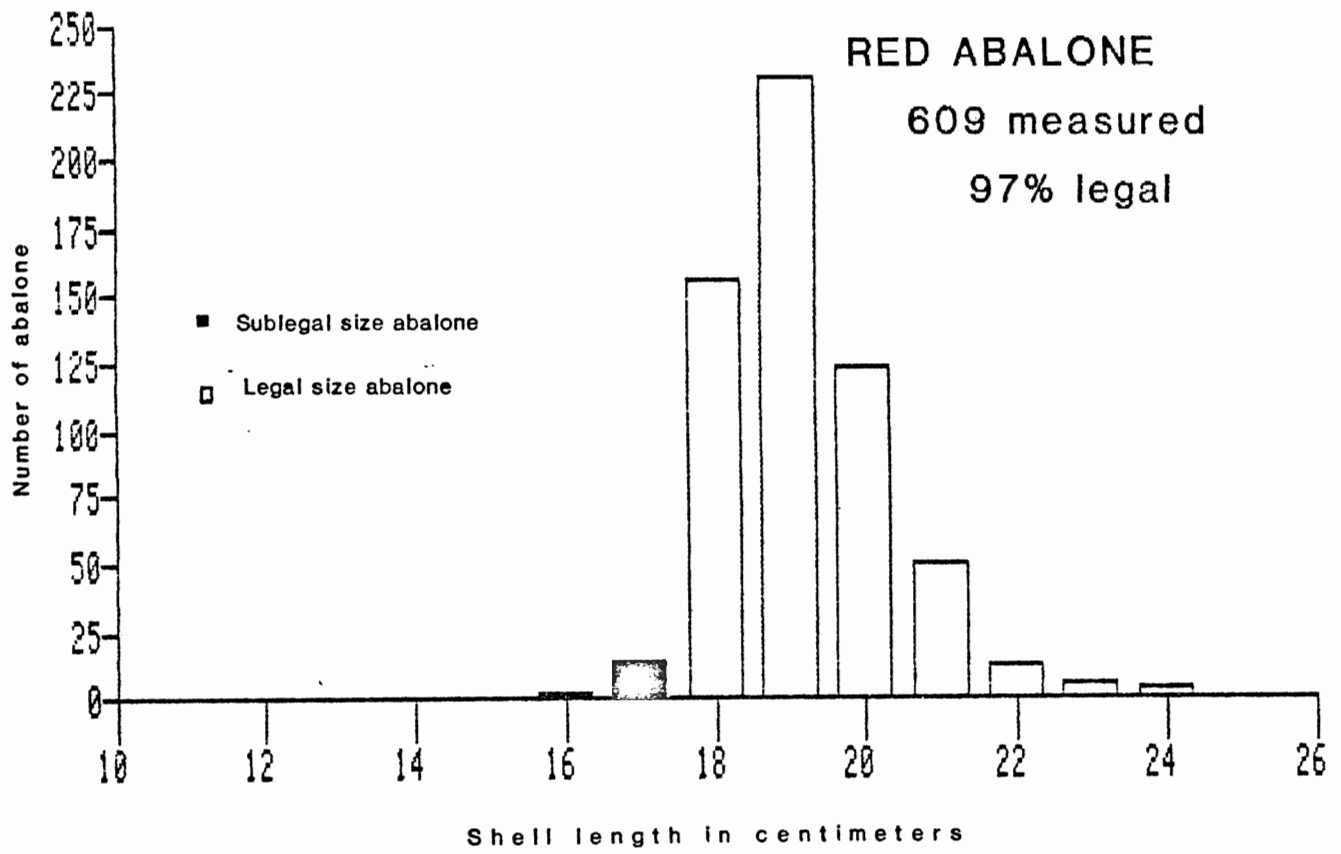


FIGURE 4. Length frequencies of red abalone and pink abalone.