

State of California  
The Resources Agency  
DEPARTMENT OF FISH AND GAME

SOUTHERN CALIFORNIA MARINE SPORT FISHING FROM  
PRIVATELY-OWNED BOATS: CATCH AND EFFORT FOR  
APRIL-JUNE 1981

by

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MARINE RESOURCES REGION

Administrative Report No. 81-8

November 1981

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ABSTRACT

The catch landed and effort expended by private-boat sport fishermen were studied in southern California between April and June 1981, in order 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 310,000 organisms were landed by 106,000 anglers and 4,000 divers (more than twice the catch and effort estimated for the previous 3-month period). The major components of the catch were Pacific mackerel, *Scomber japonicus*, 63,000 landed; bass, *Paralabrax* spp., 61,000 landed; white croaker, *Genyonemus lineatus*, 52,000 landed, and Pacific bonito, *Sarda chiliensis*, 35,000 landed. These species contributed 70% of the total catch.

Anglers' compliance with size limit regulations was variable. Approximately 89% of all measured bass were legal size. The proportion of legal size California halibut, *Paralichthys californicus*, rose from 60% last quarter to 79% this quarter. However, the percent of legal size California barracuda, *Sphyræna argentea*, was very low, 58%. Divers' compliance with minimum size limits dropped slightly: abalone, *Haliotis* spp., averaged 89% legal.

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## 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 study began in 1975 and continued for three years. During the following two years, lack of personnel caused temporary cessation of the study. However, in 1980 this restraint was removed and the study began again.

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 sport fishermen's compliance with size limit regulations.

The information generated by this study provides: 1) a baseline study for future comparison of catch and effort trends, 2) evidence for adding, deleting, or changing fishing regulations, 3) an indication 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 living 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 manpower. Field samplers remained at the sample locations from 1600 hrs. to 1800 hrs., and

an attempt was made to interview all returning anglers and divers. Information on length of angling trip, number of hours spent diving, number of fishing poles used, and number of people angling or diving was gathered along with the identification and enumeration of all fishes, molluscs, and crustaceans in possession (no data were requested about species caught, but not kept).

An attempt was made to measure all species with minimum size requirements.

#### Sampling Locations

There are five counties normally covered in the survey: Santa Barbara, Ventura, Los Angeles, Orange, and San Diego. We began sampling Los Angeles County in the summer of 1980, and slowly expanded the sampling frame to include other counties as additional personnel completed training as field samplers. This report contains the results of the first quarter of complete sampling coverage of all five southern California counties.

#### 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 has a legal minimum size limit, for the twenty most commonly landed species, for the *Sebastes* genus, and for the total number of fishes landed. Estimates were calculated separately for weekends and weekdays.

The number of boats that left a sampling area without being interviewed was recorded, providing an adjustment factor for the day's total catch or effort.

### RESULTS AND DISCUSSION

#### Data Samples

During the April 1 - June 30, 1981 quarter, 18 launch ramps, 3 boat hoists, and 3 boat-rental locations were sampled 395 times. Samplers

interviewed 26,372 anglers and 1,227 divers who spent 171,487 angler-trip-hours<sup>4/</sup> and 1,881 diver-hours<sup>5/</sup> in southern California coastal waters.

Samplers examined 65,333 fishes, molluscs, and crustaceans of 132 species in the angler catch, along with 3,428 filleted fishes and 99 fishes which could not be identified due to time constraints or the condition in which the fish were landed (Tables 1 and 2). In the sampled diver catch, 3,960 organisms of 62 species, plus 37 unidentified filleted fishes and 13 unidentified invertebrates were examined.

#### Effort

Angling effort doubled compared to the previous quarter due to two main factors: favorable weather conditions and increased catch rates of desired inshore species. Diving effort levels changed very little compared to the previous quarter except in San Diego County, where diving activity nearly tripled. Calm weather, good underwater visibility, warm water, and high catch rates contributed to this increased diving effort.

An estimated 106,000 angler-days and 4,000 diver-days were expended during this quarter (an angler-day or diver-day is one angler or diver who fished for any amount of time on a given day).

A breakdown of angler effort levels by county shows that 40% of all angling activity originated in Los Angeles County, 30% in San Diego County, 20% in Orange County, and 10% in Santa Barbara/Ventura counties (Tables 3 and 4).

The majority of all diving effort originated in San Diego County, where divers were attracted by better diving conditions and higher catch rates than elsewhere in the survey area (Tables 5 and 6).

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

<sup>5/</sup> The unit of diver effort is one hour spent underwater.

### Catch

An estimated total of 296,600 fishes and other organisms were landed by southern California anglers, and an estimated 13,800 organisms were landed by divers. Thirty-four species of fishes and invertebrates accounted for 95% of the combined angler/diver catch. The remaining 5% was composed of 54 fish and invertebrate species.

Nearly three-fourths of the angler catch was composed of just six species: Pacific mackerel, *Scomber japonicus*, 63,000 fish landed; the three *Paralabrax* bass species, 61,000; white croaker, *Genyonemus lineatus*, 52,000; and Pacific bonito, *Sarda chiliensis*, 35,000.

As in the previous quarter (January-March), red abalone, *Haliotis rufescens*, was the most abundant species landed by divers (5,300). Rock scallop, *Hinnites multirugosus* (1,700); and California sheephead, *Semicossyphus pulcher* (1,500); and red abalone accounted for three-fifths of the total estimated diver catch.

### Variation by County

The number of fishes landed by anglers in Santa Barbara and Ventura Counties was an estimated 27,000, nearly half of which were rockfishes, *Sebastes* spp. Other important contributors to the catch were kelp bass, *Paralabrax clathratus*; white croaker; Pacific mackerel; and California halibut, *Paralichthys californicus* (Table 7). Divers landed large quantities of red abalone from the northern Channel Islands, and also brought in good catches of rock scallop. The total estimated landings for divers in these two counties was 2,600 organisms.

Los Angeles County's angler catch of 140,000 fishes was dominated by surface and shallow water species, including white croaker, Pacific mackerel,

Pacific bonito, kelp bass, and barred sand bass, *Paralabrax nebulifer*.

Fishermen were pleased at the appearance of one of the favorite migratory game fishes, California barracuda, *Sphyræna argentea*, in the catch. An estimated 3,000 were landed in the area, more than three times the number landed in any of the other surveyed counties. The catch of California halibut was also relatively good, with an estimated 2,000 landed. Divers in the area were prohibited by law from taking abalone, *Haliotis* spp., along half of the county's coastline, so abalone landings were low (200). Most divers targeted on rock scallops instead (an estimated 1,000 landed). The total number of organisms landed by divers in this area was 2,400.

In Orange County Pacific mackerel made up a large portion (37%) of the 43,000 fishes landed by anglers. Pacific bonito, white croaker, and bass together made up 42% of the catch. Approximately 1,000 California barracuda were landed in the area. Divers in Orange County landed 1,200 organisms, the lowest diver catch among the five counties surveyed. Rock scallop and California sheephead composed nearly 50% of the catch, since the county's entire coastline was closed to abalone fishing.

An estimated 86,700 fishes were landed by San Diego County anglers. The three bass species, led by spotted sand bass, *Paralabrax maculatofasciatus*, made up one-third of these landings. Pacific mackerel was also of major importance, comprising 20% of the catch. Divers in this county landed more than 50% of the total diver-catch in the survey area. An estimated 7,700 organisms were landed, the majority of which were red abalone (4,400). California sheephead was the second-most common species in the catch, with an estimated 800 landed.



### Length Frequencies

The length frequency data (Table 8, Figures 1-9) show a substantial lack of compliance with size limits for white seabass, *Atractoscion nobilis*; lingcod, *Ophiodon elongatus*; and California barracuda. Less than 10% of the white seabass landed were legal size. Three factors which may account for the high incidence of these sublegal-size fish in the catch are fishermen's: 1) inability to identify white seabass, 2) unfamiliarity with the legal size limit, and 3) reticence to return a relatively large (12-26 in.) fish, even though it is not yet legal size (28 in.). In the case of lingcod, the size limit of 22 in. was imposed in March of this year and has not yet become widely known by the angling public. Slightly less than 70% of the lingcod landed were legal size. The percentage of legal-size California barracuda varied widely among counties. In Los Angeles and Orange Counties, where there was an abundance of legal-size fishes, nearly 80% of the fish landed were legal. However, in the other surveyed counties, where large barracuda were not as abundant, only 40% of the fish landed were legal size. Thus the average percentage of legal barracuda landed in southern California was 58%.

Size-limit compliance for California halibut rose almost 20% over last quarter, from 60 to 79%. Anglers followed the size limit on the basses relatively well; the percentage of legal fish measured averaged 88% for the three bass species combined.

The divers' catch of abalone generally reflected a close observance of size limits. The percentage of legal red abalone and green abalone, *Haliotis fulgens*, averaged 92%. However, measurement of pink abalone, *H. corrugata*, showed a lower compliance level, (79% legal).

TABLE 1. List of Species Sampled from Southern California Private Boats; April through June 1981.

Scientific name	Common name	No. sampled
<i>Alopias vulpinus</i>	common thresher	5
<i>Amphistichus argenteus</i>	barred surfperch	248
<i>Anisotremus davidsonii</i>	sargo	22
<i>Anoplopoma fimbria</i>	sablefish	73
<i>Atherinops affinis</i>	topsmelt	22
<i>Atherinopsis californiensis</i>	jacksmelt	119
<i>Atractoscion nobilis</i>	white seabass	150
<i>Balistes polylepis</i>	finescale triggerfish	12
<i>Caulolatilus princeps</i>	ocean whitefish	442
<i>Cheilotrema saturnum</i>	black croaker	75
<i>Chromis punctipinnis</i>	blacksmith	13
<i>Citharichthys sordidus</i>	Pacific sanddab	1,182
<i>C. stigmatæus</i>	speckled sanddab	3
<i>C. xanthostigma</i>	longfin sanddab	1
<i>Cymatogaster aggregata</i>	shiner surfperch	2
<i>Damalichthys vacca</i>	pile surfperch	45
<i>Embiotoca jacksoni</i>	black surfperch	415
<i>E. lateralis</i>	striped surfperch	5
<i>Eopsetta jordani</i>	petrale sole	24
<i>Galeorhinus zyopterus</i>	soupfin shark	1
<i>Genyonemus lineatus</i>	white croaker	11,321
<i>Girella nigricans</i>	opaleye	288
<i>Gymnura marmorata</i>	California butterfly ray	1
<i>Gymnothorax mordax</i>	California moray	2
<i>Halichoeres semicinctus</i>	rock wrasse	17
<i>Hermosilla azurea</i>	zebraperch	3
<i>Heterodontus francisci</i>	horn shark	1
<i>Heterostichus rostratus</i>	giant kelpfish	61
<i>Hexagrammos decagrammus</i>	kelp greenling	1
<i>Hippoglossina stomata</i>	bigmouth sole	11
<i>Hydrolagus colliei</i>	ratfish	8
<i>Hyperprosopon argenteum</i>	walleye surfperch	21
<i>Hypsopsetta guttulata</i>	diamond turbot	37
<i>Hypsurus caryi</i>	rainbow surfperch	21
<i>Isurus oxyrinchus</i>	bonito shark	21
<i>Lepidopsetta bilineata</i>	rock sole	1
<i>Leptocottus armatus</i>	Pacific staghorn sculpin	1
<i>Leuresthes tenuis</i>	California grunion	2
<i>Medialuna californiensis</i>	halfmoon	580
<i>Menticirrhus undulatus</i>	California corbina	11
<i>Merluccius productus</i>	Pacific hake	14
<i>Mola mola</i>	common mola	2
<i>Mugil cephalus</i>	striped mullet	1

Table 1 - cont'd.

Scientific name	Common name	No. sampled
<i>Mustelus californicus</i>	gray smoothhound	85
<i>M. henlei</i>	brown smoothhound	19
<i>M. lunatus</i>	sicklefin smoothhound	1
<i>Myliobatis californica</i>	bat ray	32
<i>Ophiodon elongatus</i>	lingcod	138
<i>Oxyjulis californica</i>	senorita	49
<i>Paralabrax clathratus</i>	kelp bass	6,516
<i>P. maculatofasciatus</i>	spotted sand bass	2,892
<i>P. nebulifer</i>	barred sand bass	4,567
<i>Paralichthys californicus</i>	California halibut	1,259
<i>Peprilus simillimus</i>	Pacific butterfish	3
<i>Phanerodon furcatus</i>	white surfperch	33
<i>Platyrrhinoidis triseriata</i>	thornback	4
<i>Pleuronichthys coenosus</i>	C-O turbot	2
<i>P. verticalis</i>	hornyhead turbot	1
<i>Porichthys myriaster</i>	specklefin midshipman	6
<i>P. notatus</i>	plainfin midshipman	1
<i>Prionace glauca</i>	blue shark	107
<i>Rhacochilus toxotes</i>	rubberlip surfperch	67
<i>Rhinobatos productus</i>	shovelnose guitarfish	112
<i>Roccus saxatilis</i>	striped bass	8
<i>Roncador stearnsi</i>	spotfin croaker	3
<i>Sarda chiliensis</i>	Pacific bonito	6,810
<i>Scomber japonicus</i>	Pacific mackerel	14,573
<i>Scarpaena guttata</i>	sculpin	1,179
<i>Scorpaenichthys marmoratus</i>	cabezon	233
<i>Sebastes atrovirens</i>	kelp rockfish	475
<i>S. auriculatus</i>	brown rockfish	315
<i>S. babcocki</i>	redbanded rockfish	3
<i>S. carnatus</i>	gopher rockfish	269
<i>S. caurinus</i>	copper rockfish	963
<i>S. chlorostictus</i>	greenspotted rockfish	702
<i>S. chrysomelas</i>	black and yellow rockfish	120
<i>S. constellatus</i>	starry rockfish	499
<i>S. dallii</i>	calico rockfish	19
<i>S. diploproa</i>	splitnose rockfish	5
<i>S. elongatus</i>	greenstriped rockfish	141
<i>S. ensifer</i>	swordspine rockfish	4
<i>S. entomelas</i>	widow rockfish	95
<i>S. eos</i>	pink rockfish	15
<i>S. flavidus</i>	yellowtail rockfish	66
<i>S. gilli</i>	bronzespotted rockfish	3
<i>S. goodei</i>	chilipepper	131
<i>S. hopkinsi</i>	squarespot rockfish	16
<i>S. levis</i>	cowcod	28
<i>S. macdonaldi</i>	Mexican rockfish	2
<i>S. miniatus</i>	vermilion rockfish	608
<i>S. mystinus</i>	blue rockfish	917

Table 1 - cont'd.

Scientific name	Common name	No. sampled
<i>S. ovalis</i>	speckled rockfish	69
<i>S. paucispinus</i>	bocaccio	1,067
<i>S. phillipsi</i>	chameleon rockfish	7
<i>S. pinniger</i>	canary rockfish	37
<i>S. rastrelliger</i>	grass rockfish	354
<i>S. rosaceus</i>	rosy rockfish	220
<i>S. rosenblatti</i>	greenblotched rockfish	81
<i>S. rubrivinctus</i>	flag rockfish	136
<i>S. rufus</i>	bank rockfish	13
<i>S. saxicola</i>	stripetail rockfish	8
<i>S. serranoides</i>	olive rockfish	840
<i>S. serriiceps</i>	reef fish	199
<i>S. umbrosus</i>	honeycomb rockfish	117
<i>Sebastes alascanus</i>	shortspine thornyhead	3
<i>Semicossyphus pulcher</i>	California sheephead	1,049
<i>Seriphus politus</i>	queenfish	1,013
<i>Seriola dorsalis</i>	yellowtail	81
<i>Sphyræna argentea</i>	California barracuda	1,096
<i>Squalus acanthias</i>	spiny dogfish	62
<i>Squatina californica</i>	Pacific angel shark	3
<i>Stereolepis gigas</i>	giant sea bass	12
<i>Strongylura exilis</i>	California needlefish	9
<i>Synodus luciosceps</i>	California lizardfish	54
<i>Thunnus thynnus</i>	bluefin tuna	1
<i>Trachurus symmetricus</i>	jack mackerel	56
<i>Triakis semifasciata</i>	leopard shark	21
<i>Umbrina roncadore</i>	yellowfin croaker	452
<i>Urophycis halleri</i>	round stingray	5
<i>Xenistius californiensis</i>	salema	1
<i>Zystreurus liolepis</i>	fantail sole	2
-	unidentified fish	99
-	unidentified filleted fish	1,499
<i>Sebastes</i> spp.	unidentified rockfish fillets	1,966

Molluscs and Crustaceans

<i>Cancer antennarius</i>	rock crab	67
<i>C. anthonyi</i>	yellow crab	4
<i>C. productus</i>	red crab	19
<i>Cypraea spadicea</i>	chestnut cowry	8
<i>Haliotis corrugata</i>	pink abalone	208
<i>H. cracherodii</i>	black abalone	40
<i>H. fulgens</i>	green abalone	225
<i>H. rufescens</i>	red abalone	1,515
<i>H. sorenseni</i>	white abalone	4
<i>Hinnites multirugosus</i>	rock scallop	538

Table 1 - cont'd.

<u>Scientific name</u>	<u>Common name</u>	<u>No. sampled</u>
<i>Kelletia kelletii</i>	Kellets whelk	8
<i>Loxorhynchus grandis</i>	sheep crab	86
<i>Octopus bimaculatus</i>	twospot octopus	4
<i>Pachygrapsus crassipes</i>	striped shore crab	7
<i>Panulirus interruptus</i>	California spiny lobster	1
<i>Pugettia gracilis</i>	graceful kelp crab	1
<i>Tivela stultorum</i>	pismo clam	10
<i>Brachyura</i>	unidentified crab	1
<i>Mollusca</i>	unidentified mollusc	6
<u>Echinoderms and Coelenterates</u>		
<i>Dendraster excentricus</i>	sand dollar	9
<i>Strongylocentrotus franciscanus</i>	giant red urchin	12
<i>Strongylocentrotus purpuratus</i>	purple urchin	51
<i>Piaster</i> spp.	sea star	25
Gorgonacea	sea fan	1

TABLE 2. Most Commonly Landed Species; April through June 1981.

Scientific name	Common name	No. sampled
<i>Scomber japonicus</i>	Pacific mackerel	14,573
<i>Genyonemus lineatus</i>	white croaker	11,321
<i>Sarda chiliensis</i>	Pacific bonito	6,810
<i>Paralabrax clathratus</i>	kelp bass	6,516
<i>P. nebulifer</i>	barred sand bass	4,567
<i>P. maculatofasciatus</i>	spotted sand bass	2,892
<i>Paralichthys californicus</i>	California halibut	1,259
<i>Citharichthys sordidus</i>	Pacific sanddab	1,182
<i>Scorpaena guttata</i>	sculpin	1,179
<i>Sphyræna argentea</i>	California barracuda	1,096
<i>Sebastes paucispinus</i>	bocaccio	1,067
<i>Semicossyphus pulcher</i>	California sheephead	1,049
<i>Seriphus politus</i>	queenfish	1,013
<i>Sebastes caurinus</i>	copper rockfish	963
<i>S. mystinus</i>	blue rockfish	917
<i>S. serranoides</i>	olive rockfish	840
<i>S. chlorostictus</i>	greenspotted rockfish	702
<i>S. miniatus</i>	vermilion rockfish	608
<i>Medialuna californiensis</i>	halfmoon	580
<i>Sebastes constellatus</i>	starry rockfish	499
<i>S. atrovirens</i>	kelp rockfish	475
<i>Umbrina roncadior</i>	yellowfin croaker	452
<i>Caulolatilus princeps</i>	ocean whitefish	442
<i>Embiotoca jacksoni</i>	black surfperch	415
<i>Sebastes rastrelliger</i>	grass rockfish	354
<i>S. auriculatus</i>	brown rockfish	315
<i>Girella nigricans</i>	opaleye	288
<i>Sebastes carnatus</i>	gopher rockfish	269
<i>Amphistichus argenteus</i>	barred surfperch	248
<i>Scorpaenichthys marmoratus</i>	cabezon	233
<i>Sebastes rosaceus</i>	rosy rockfish	220
<u>Molluscs</u>		
<i>Haliotis rufescens</i>	red abalone	1,515
<i>Hinnites multirugosus</i>	rock scallop	538
<i>Haliotis fulgens</i>	green abalone	225
<i>H. corrugata</i>	pink abalone	208

TABLE 3. Catch and Effort Estimates for Anglers; April through June 1981.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
<b>Angler parties</b>					
weekend	2,254	9,588	5,662	7,339	24,843
weekday	<u>1,362</u>	<u>6,977</u>	<u>2,610</u>	<u>5,799</u>	<u>16,748</u>
total	3,616	16,565	8,272	13,138	41,591
<b>Angler days</b>					
weekend	5,922	26,792	15,140	19,247	67,101
weekday	<u>3,431</u>	<u>17,012</u>	<u>6,009</u>	<u>12,720</u>	<u>39,172</u>
total	9,353	43,804	21,149	31,967	106,273
<b>Angler-trip-hours</b>					
weekend	39,863	171,529	95,628	131,191	438,211
weekday	<u>20,968</u>	<u>99,519</u>	<u>34,296</u>	<u>89,796</u>	<u>244,579</u>
total	60,831	271,048	129,924	220,987	682,790
<b>Total fishes landed</b>					
weekend	17,837	75,269	27,547	47,871	168,524
weekday	<u>8,730</u>	<u>65,154</u>	<u>15,404</u>	<u>38,801</u>	<u>128,089</u>
total	26,567	140,423	42,951	86,672	296,613
<b>No. rockfishes landed</b>					
weekend	9,214	6,499	1,480	7,610	24,803
weekday	<u>3,232</u>	<u>3,270</u>	<u>425</u>	<u>3,911</u>	<u>10,838</u>
total	12,446	9,769	1,905	11,521	35,641
<i>Anoplopoma fimbria</i> (sablefish)					
	6	114	72	71	263
<i>Atractoscion nobilis</i> (white seabass)					
	17	134	239	223	610
<i>Caulolatilus princeps</i> (ocean whitefish)					
	184	723	53	1,060	2,020
<i>Citharichthys sordidus</i> (Pacific sanddab)					
	715	2,227	222	4,038	7,238
<i>Embiotoca jacksoni</i> (black surfperch)					
	2	1,157	415	153	1,727
<i>Genyonemus lineatus</i> (white croaker)					
	2,891	38,704	3,930	6,940	52,465

TABLE 3 - cont'd.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
<i>Girella nigricans</i> (opaleye)	0	790	124	282	1,196
<i>Medialuna californiensis</i> (halfmoon)	36	1,656	403	695	2,790
<i>Oncorhynchus tshawytscha</i> (king salmon)	0	0	0	0	0
<i>Ophiodon elongatus</i> (lingcod)	173	22	18	140	353
<i>Paralabrax clathratus</i> (kelp bass)	4,454	10,950	3,036	8,376	26,816
<i>P. maculatofasciatus</i> (spotted sand bass)	4	230	2,152	11,075	13,461
<i>P. nebulifer</i> (barred sand bass)	661	6,486	4,380	9,257	20,784
<i>Paralichthys californicus</i> (California halibut)	1,304	1,821	303	1,129	4,557
<i>Sarda chiliensis</i> (Pacific bonito)	20	27,099	4,652	2,834	34,605
<i>Scomber japonicus</i> (Pacific mackerel)	1,625	27,864	15,862	17,519	62,870
<i>Scorpaena guttata</i> (sculpin)	168	2,579	585	1,934	5,266
<i>Sebastes atrovirens</i> (kelp rockfish)	318	323	0	980	1,621
<i>S. auriculatus</i> (brown rockfish)	323	411	29	218	981
<i>S. caurinus</i> (copper rockfish)	1,613	221	26	224	2,084
<i>S. chlorostictus</i> (greenspotted rockfish)	639	932	90	957	2,618
<i>S. goodei</i> (chilipepper)	24	219	69	194	506
<i>S. miniatus</i> (vermilion rockfish)	618	427	137	785	1,967



TABLE 3. - cont'd.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
<i>S. mystinus</i> (blue rockfish)	1,449	91	67	338	1,945
<i>S. paucispinus</i> (boquaccio)	379	1,682	349	1,610	4,020
<i>S. rastrelliger</i> (grass rockfish)	473	599	56	97	1,225
<i>S. serranooides</i> (olive rockfish)	669	1,125	234	793	2,821
<i>Semicossyphus pulcher</i> (California sheephead)	76	578	592	1,156	2,402
<i>Sphyraena argentea</i> (California barracuda)	46	2,871	939	835	4,691
<i>Trachurus symmetricus</i> (jack mackerel)	71	69	6	4	150

TABLE 4. Standard Error of the Estimates for Anglers; April through June 1981.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Angler parties	202	613	533	1,207	1,624
Angler days	504	1,699	1,386	2,974	4,209
Angler-trip-hours	3,199	10,281	8,486	21,360	27,990
Total fishes landed	1,809	6,199	3,791	9,390	14,270
No. rockfishes landed	1,030	541	340	1,547	2,332
barred sand bass	97	1,098	642	1,614	2,058
black surfperch	1	333	240	64	416
blue rockfish	145	27	26	97	179
bocaccio	100	329	107	357	507
brown rockfish	45	87	19	74	124
California barracuda	22	605	178	154	650
California halibut	138	256	60	170	342
California sheephead	11	116	211	159	289
chilipepper	8	120	29	91	153
copper rockfish	240	46	9	51	250
grass rockfish	90	164	19	21	189
greenspotted rockfish	176	311	24	229	426
halfmoon	21	377	115	271	479
jack mackerel	47	37	3	3	59
kelp bass	416	1,336	412	962	1,747
kelp rockfish	43	159	0	152	224
king salmon	0	0	0	0	0
lingcod	33	7	12	26	44
ocean whitefish	22	392	16	238	459
olive rockfish	117	221	56	120	283
opaleye	0	296	46	105	317
Pacific bonito	6	4,566	875	389	4,665
Pacific mackerel	228	3,347	2,243	2,114	4,556
Pacific sanddab	208	1,222	59	2,840	3,099
sablefish	3	49	26	30	62
sculpin	32	437	133	302	549
spotted sand bass	2	93	460	1,576	1,644
vermillion rockfish	201	191	61	161	327
white croaker	536	5,702	469	1,544	5,950
white seabass	7	38	67	44	89

TABLE 5. Catch and Effort Estimates for Divers; April through June 1981.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
<b>Diver parties</b>					
weekend	211	156	96	838	1,301
weekday	74	93	99	316	582
total	285	249	195	1,154	1,883
<b>Diver days</b>					
weekend	554	341	228	2,090	3,213
weekday	174	183	197	645	1,199
total	728	524	425	2,735	4,412
<b>Diver-hours</b>					
weekend	1,354	473	327	2,401	4,555
weekday	342	331	268	659	1,600
total	1,696	804	595	3,060	6,155
<b>No. organisms landed</b>					
weekend	1,917	1,671	760	6,051	10,399
weekday	640	689	481	1,628	3,438
total	2,557	2,360	1,241	7,679	13,837
<i>Haliotis corrugata</i> (pink abalone)					
	269	89	0	112	470
<i>H. cracherodii</i> (black abalone)					
	50	8	23	0	81
<i>H. fulgens</i> (green abalone)					
	22	71	129	739	961
<i>H. rufescens</i> (red abalone)					
	875	32	0	4,399	5,306
<i>Hinnites multirugosus</i> (rock scallop)					
	347	974	285	124	1,730
<i>Panulirus interruptus</i> (California spiny lobster)					
	0	0	0	0	0
<i>Paralabrax clathratus</i> (kelp bass)					
	103	219	70	321	713
<i>Semicossyphus pulcher</i> (California sheephead)					
	202	205	334	777	1,518

TABLE 6. Standard Error of the Estimates for Divers; April through June 1981.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Diver parties	24	41	40	144	157
Diver days	66	87	79	334	360
Diver-hours	210	177	156	440	541
No. organisms landed	358	545	316	982	1,221
black abalone	18	4	11	0	21
California sheephead	44	53	99	141	186
California spiny lobster	0	0	0	0	0
green abalone	8	30	44	189	196
kelp bass	21	87	35	59	113
pink abalone	34	40	0	33	62
red abalone	172	18	0	659	682
rock scallop	105	376	80	45	401

TABLE 7. Ten Most Commonly Landed Species in Each County; April through June 1981.

County	Rank	Scientific name	Common name
Santa Barbara/ Ventura	1.	<i>Paralabrax clathratus</i>	kelp bass
	2.	<i>Genyonemus lineatus</i>	white croaker
	3.	<i>Scomber japonicus</i>	Pacific mackerel
	4.	<i>Sebastes caurinus</i>	copper rockfish
	5.	<i>S. mystinus</i>	blue rockfish
	6.	<i>Paralichthys californicus</i>	California halibut
	7.	<i>Haliotis rufescens</i>	red abalone
	8.	<i>Citharichthys sordidus</i>	Pacific sanddab
	9.	<i>Sebastes serranoides</i>	olive rockfish
	10.	<i>Paralabrax nebulifer</i>	barred sand bass
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>Paralabrax clathratus</i>	kelp bass
	5.	<i>P. nebulifer</i>	barred sand bass
	6.	<i>Sphyræna argentea</i>	California barracuda
	7.	<i>Scorpaena guttata</i>	sculpin
	8.	<i>Citharichthys sordidus</i>	Pacific sanddab
	9.	<i>Paralichthys californicus</i>	California halibut
	10.	<i>Seriphus politus</i>	queenfish
Orange	1.	<i>Scomber japonicus</i>	Pacific mackerel
	2.	<i>Sarda chiliensis</i>	Pacific bonito
	3.	<i>Paralabrax nebulifer</i>	barred sand bass
	4.	<i>Genyonemus lineatus</i>	white croaker
	5.	<i>Paralabrax clathratus</i>	kelp bass
	6.	<i>P. maculatofasciatus</i>	spotted sand bass
	7.	<i>Seriphus politus</i>	queenfish
	8.	<i>Sphyræna argentea</i>	California barracuda
	9.	<i>Semicossyphus pulcher</i>	California sheephead
	10.	<i>Scorpaena guttata</i>	sculpin
San Diego	1.	<i>Scomber japonicus</i>	Pacific mackerel
	2.	<i>Paralabrax maculatofasciatus</i>	spotted sand bass
	3.	<i>P. nebulifer</i>	barred sand bass
	4.	<i>P. clathratus</i>	kelp bass
	5.	<i>Genyonemus lineatus</i>	white croaker
	6.	<i>Haliotis rufescens</i>	red abalone
	7.	<i>Citharichthys sordidus</i>	Pacific sanddab
	8.	<i>Sarda chiliensis</i>	Pacific bonito
	9.	<i>Seriphus politus</i>	queenfish
	10.	<i>Scorpaena guttata</i>	sculpin

TABLE 8. Occurrence of Sublegal-size Fishes in Examined Catches; April through June 1981.

<u>Scientific name</u>	<u>Common name</u>	<u>No. examined</u>	<u>% legal</u>
<u>Fishes</u>			
<i>Atractoscion nobilis</i>	white seabass	108	9
<i>Ophiodon elongatus</i>	lingcod	118	69
<i>Paralabrax clathratus</i>	kelp bass	4,526	89
<i>P. nebulifer</i>	barred sand bass	3,000	90
<i>P. maculatofasciatus</i>	spotted sand bass	1,896	86
<i>Paralichthys californicus</i>	California halibut	1,155	79
<i>Sphyræna argentea</i>	California barracuda	649	58
<u>Molluscs</u>			
<i>Haliotis corrugata</i>	pink abalone	158	79
<i>H. fulgens</i>	green abalone	178	94
<i>H. rufescens</i>	red abalone	1,313	90

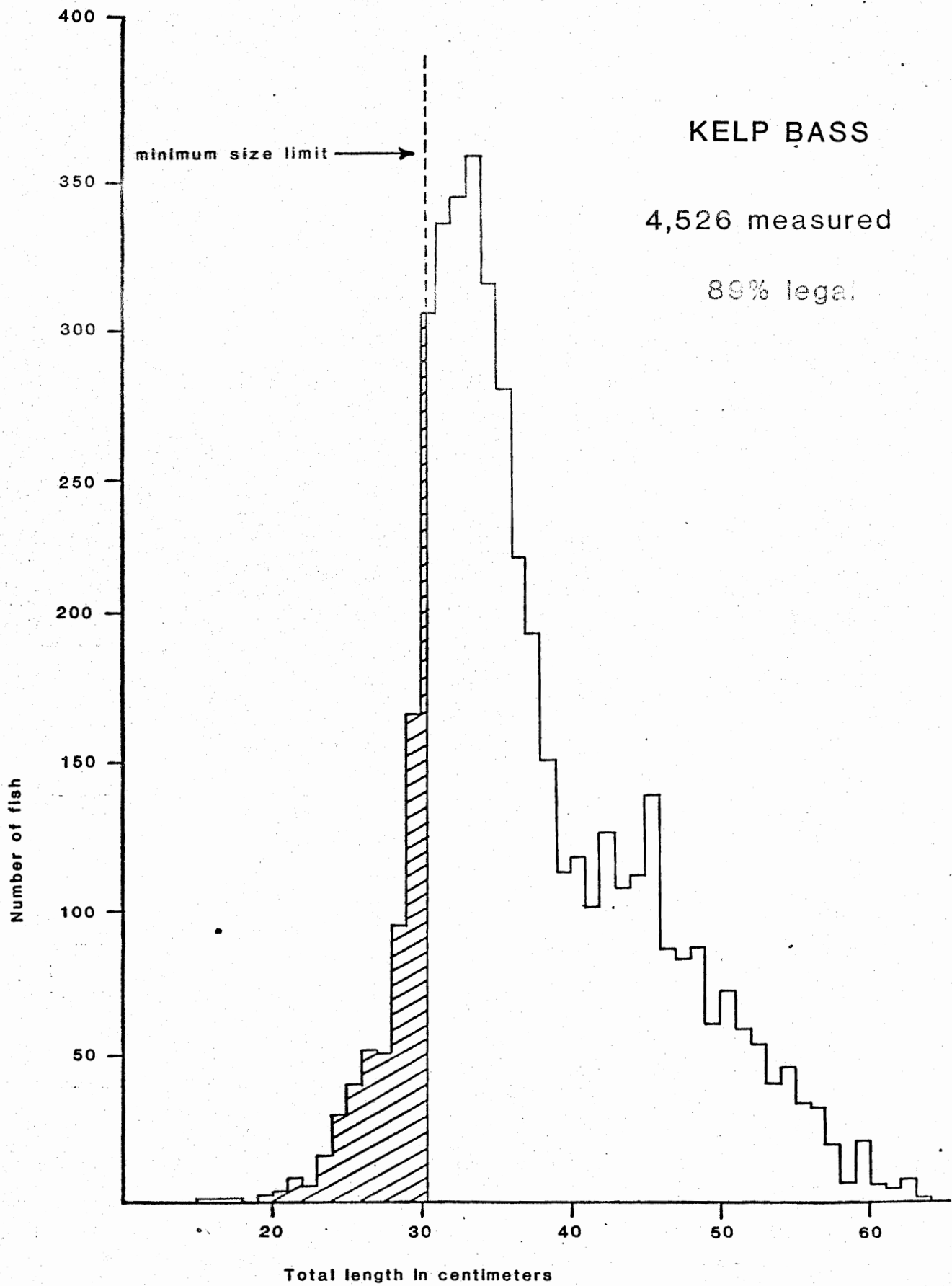


Figure 1. Length frequency of kelp bass.

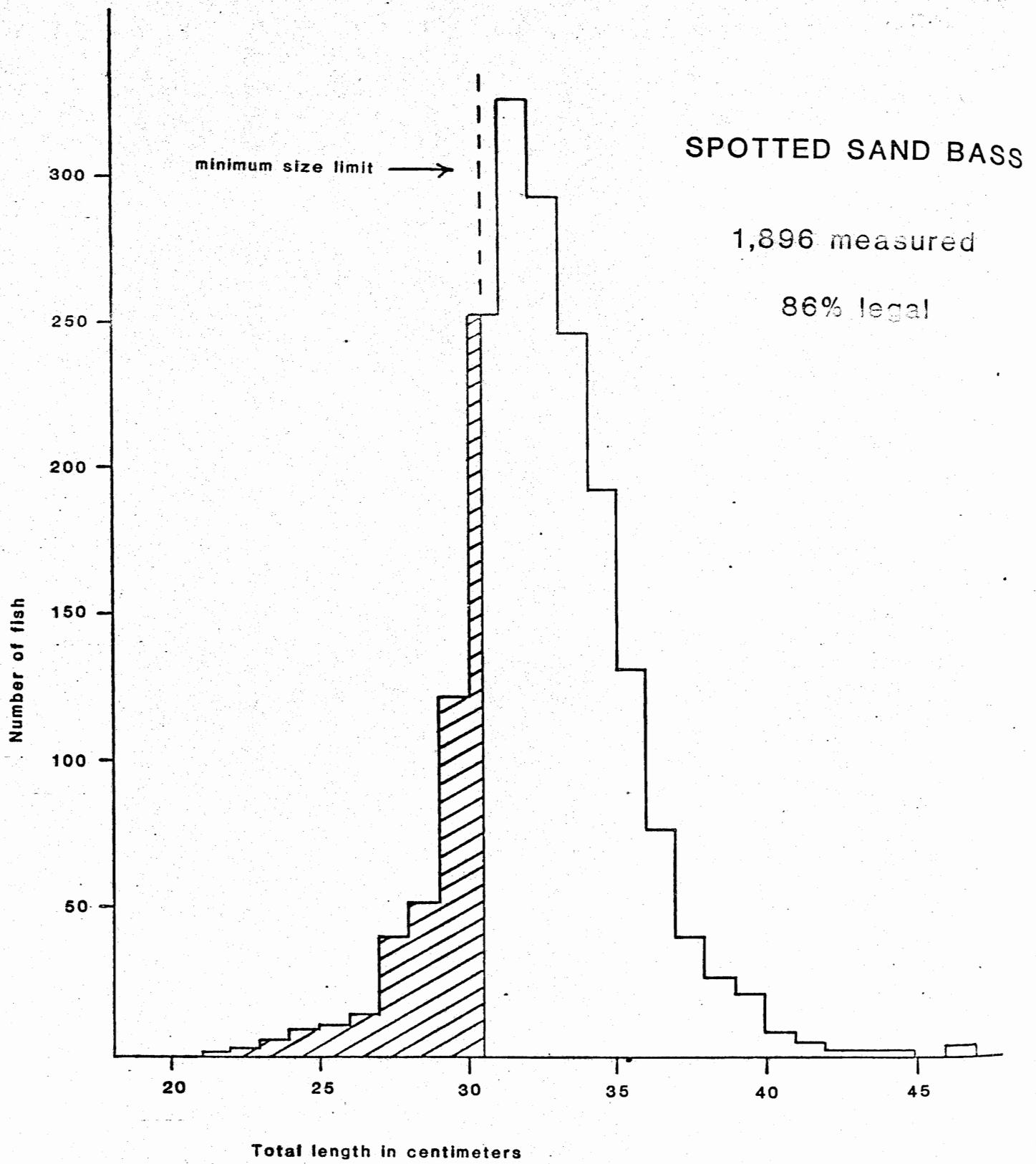


Figure 2. Length frequency of spotted sand bass.



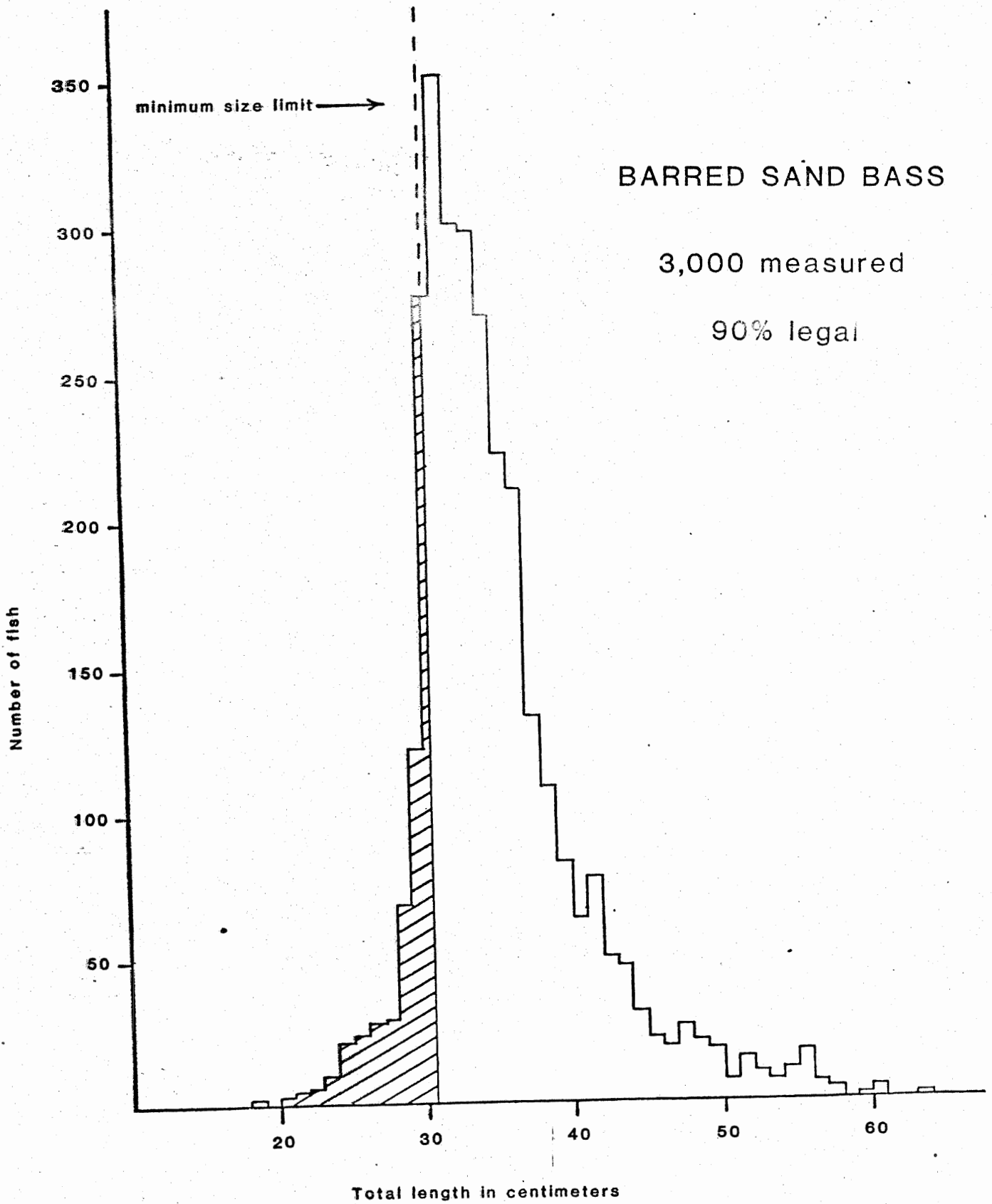


Figure 3. Length frequency of barred sand bass.

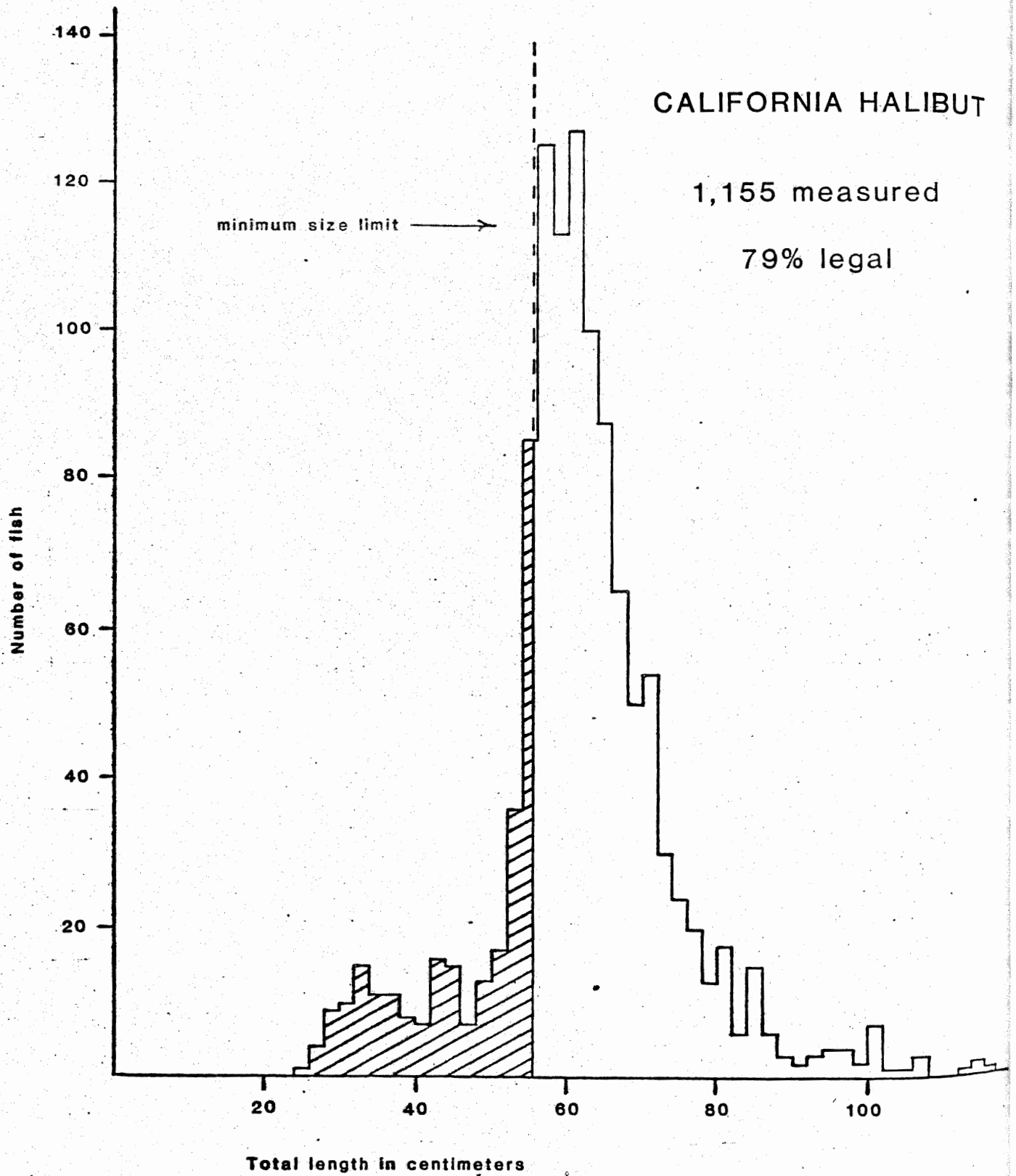


Figure 4. Length frequency of California halibut.

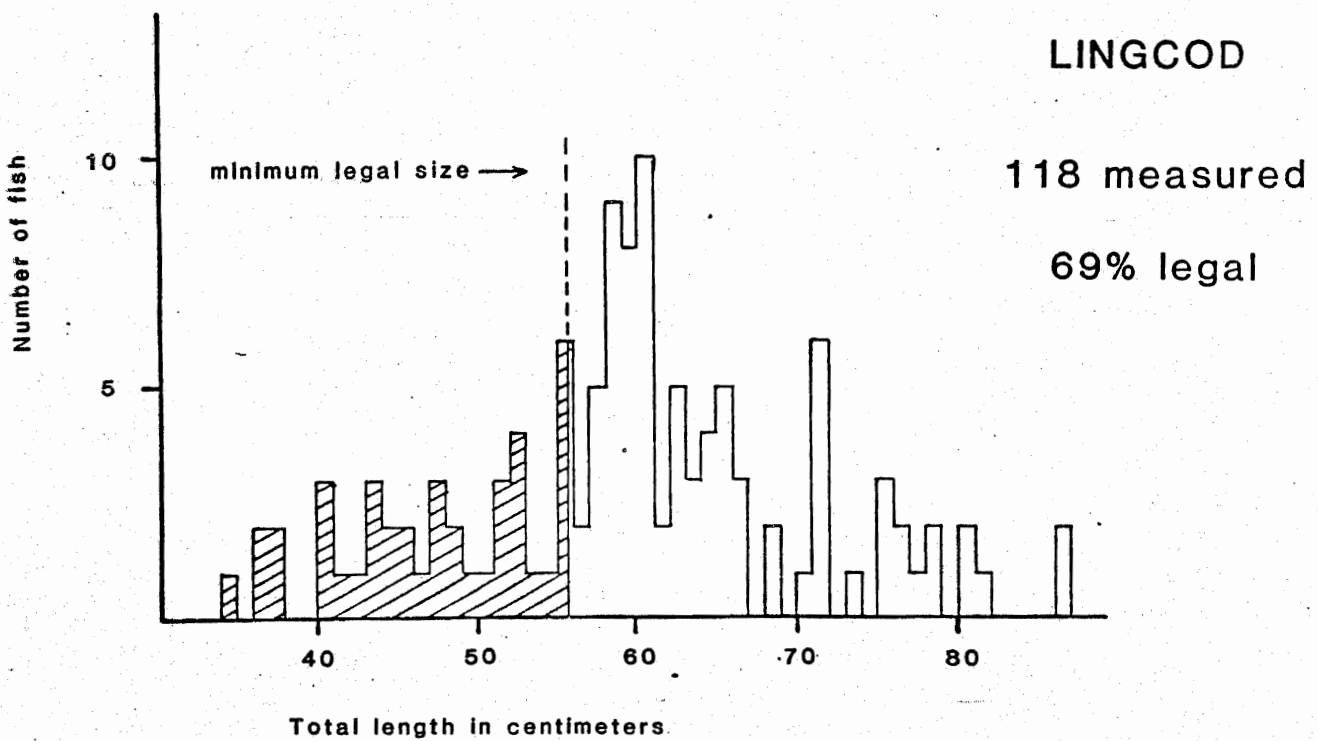
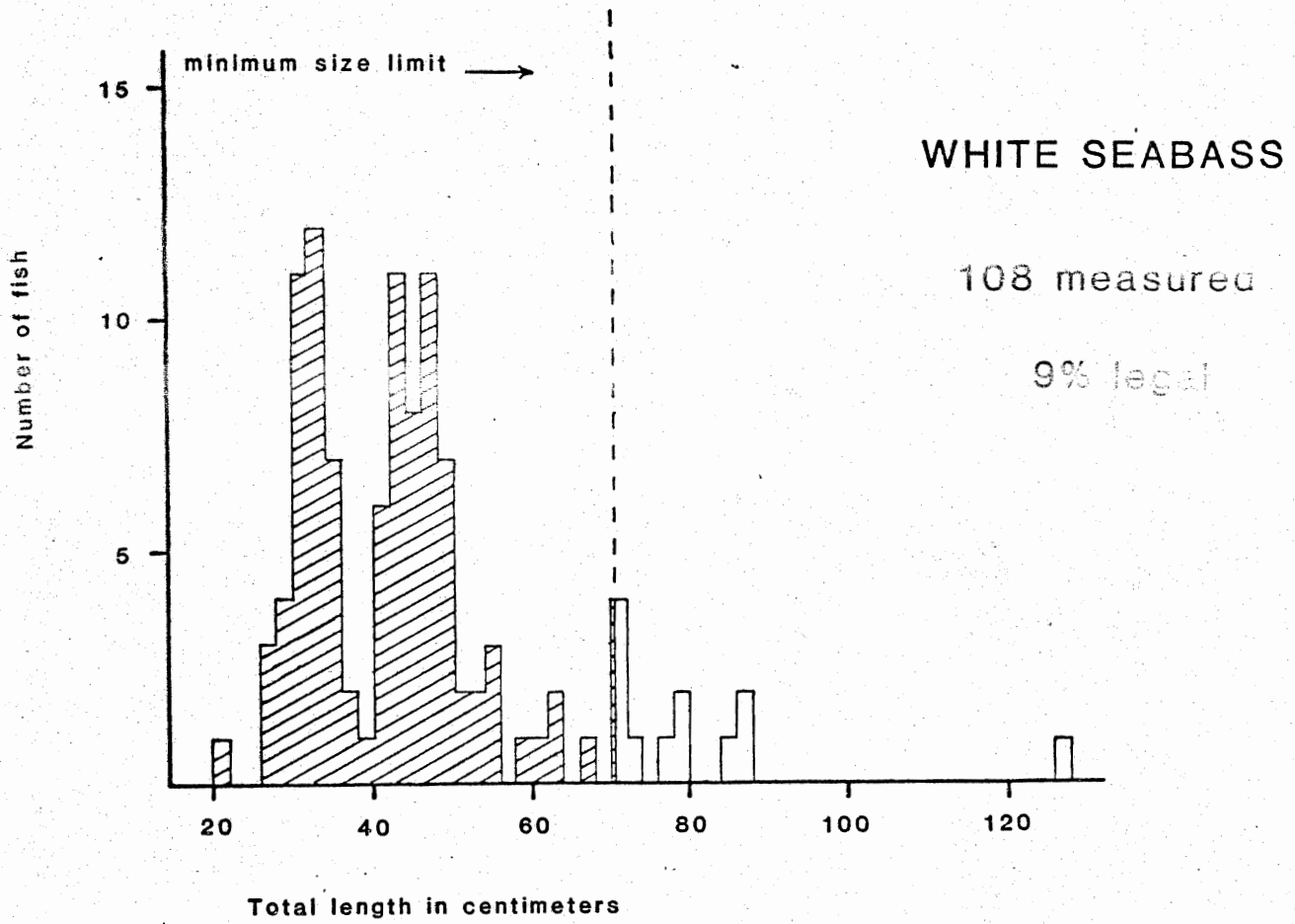


Figure 5. Length frequencies of white seabass and lingcod.

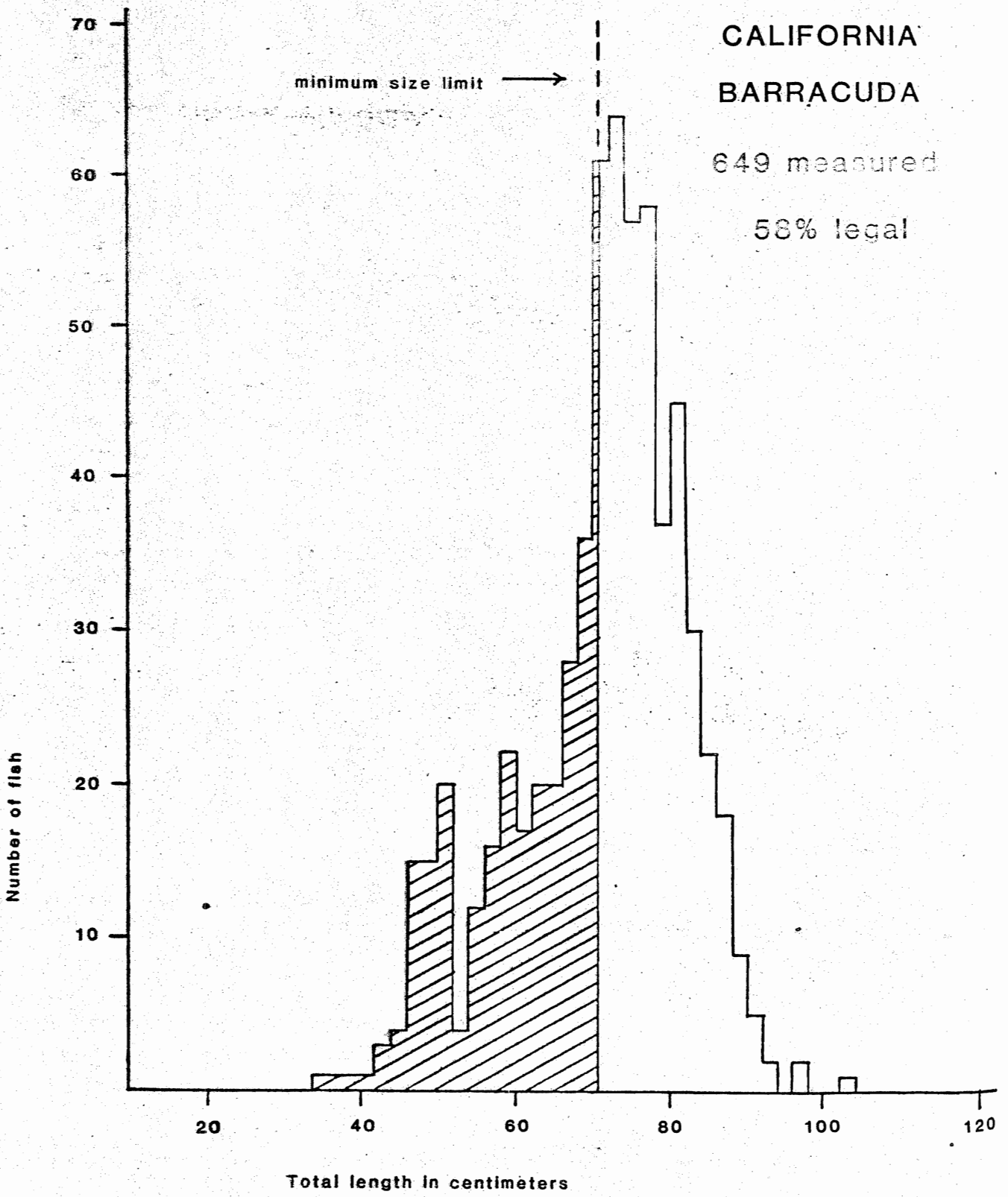


Figure 6. Length frequency of California barracuda.

# PINK ABALONE

158 measured

79% legal

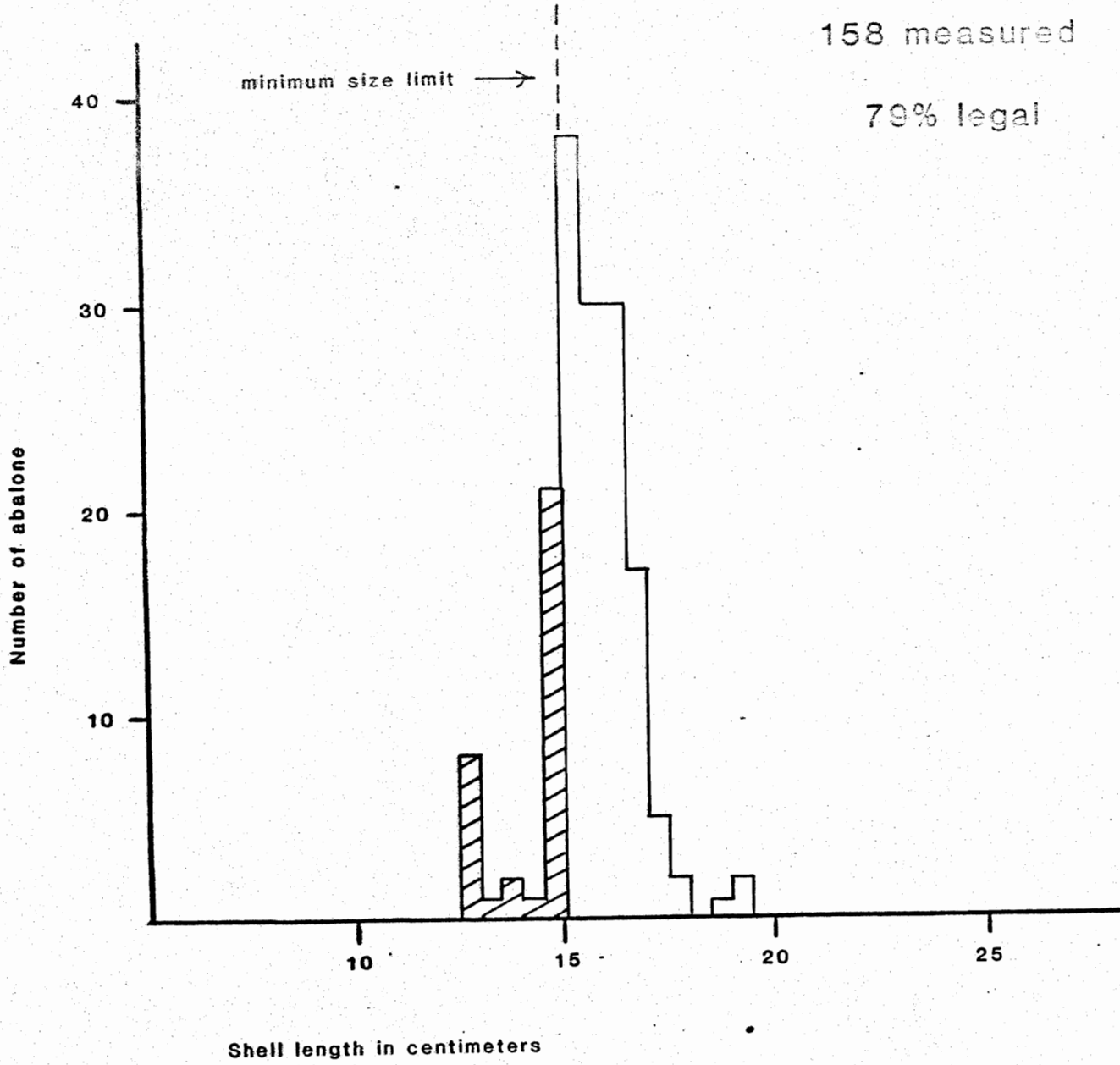


Figure 7. Length frequency of pink abalone.

# GREEN ABALONE

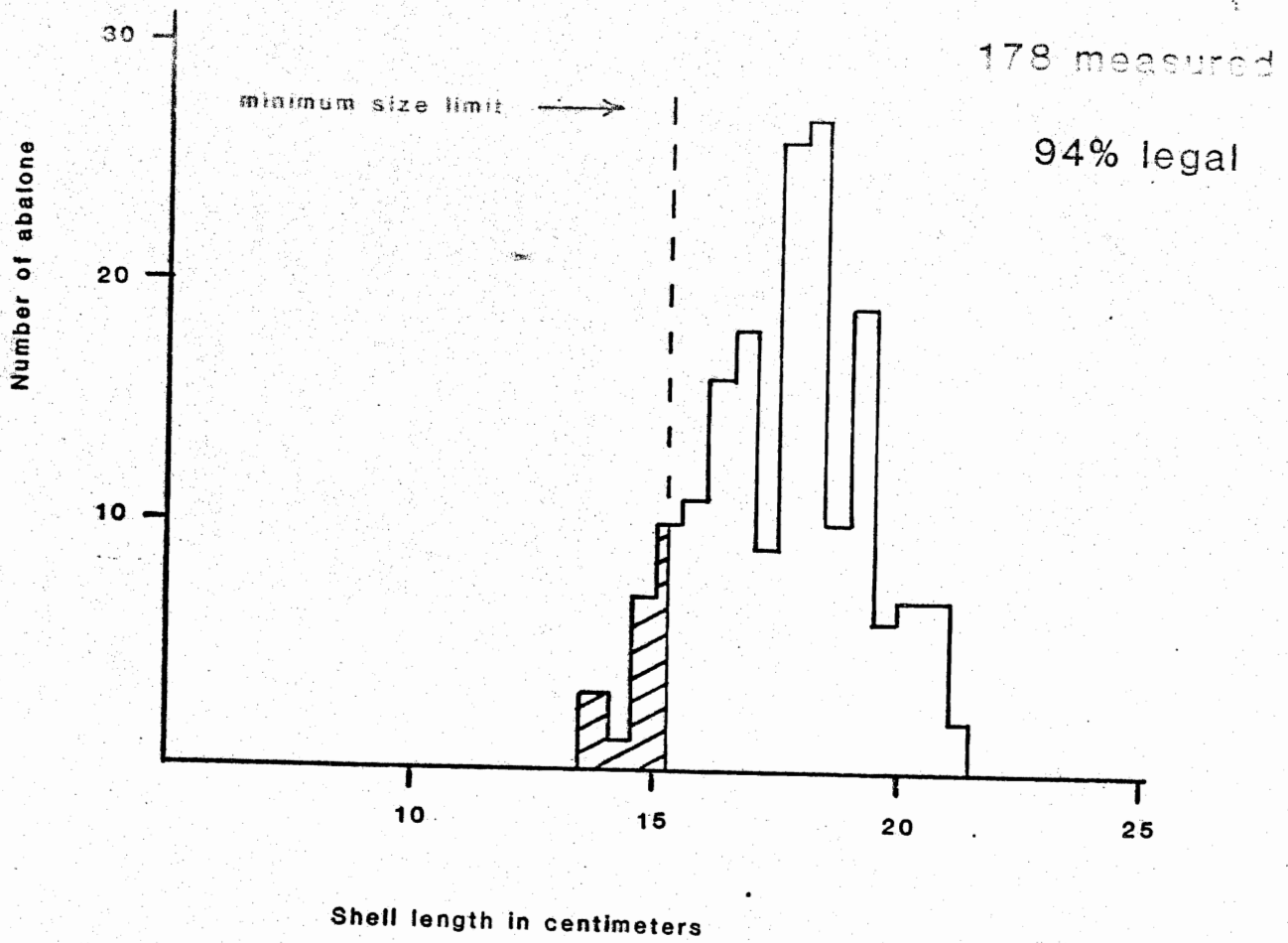


Figure 8. Length frequency for green abalone.

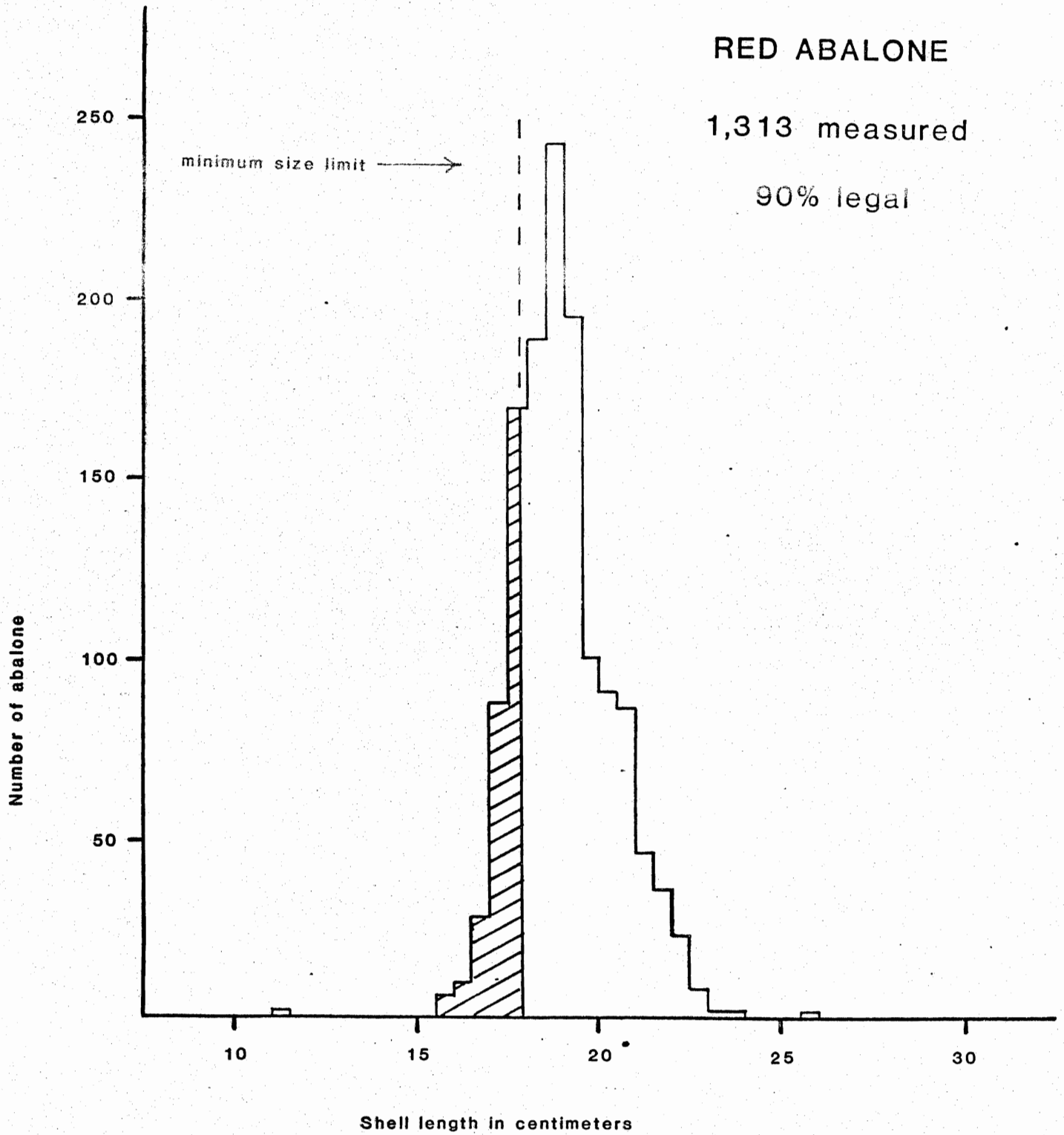


Figure 9. Length frequency of red abalone.