

State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

SOUTHERN CALIFORNIA MARINE SPORT FISHING FROM
PRIVATELY OWNED BOATS: CATCH AND EFFORT
FOR JANUARY-MARCH 1983

by

David S. Ono

Marine Resources Division
Administrative Report No. 86-1

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ABSTRACT

The catch landed and effort expended by private-boat sport fishermen were studied in southern California between January and March 1983 in order to determine the impact on local marine resources by one segment of the sport fishery. 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 selected species, and length frequencies for those species with minimum size limits.

An estimated 74,200 organisms were landed by 29,400 anglers and 1500 divers. The major species in the angler catch included white croaker, Genyonemus lineatus, (16,000 landed) and Pacific mackerel, Scomber japonicus (14,000 landed). The two species combined made up 44% of the total estimated angler catch. Divers, hampered in their activity by stormy conditions, landed an estimated 1700 rock scallop, Hinnites multirugosus. This single species represented almost a third of the estimated diver catch.

The length frequency data, collected for size-regulated fish and shellfish species, show that minimum size-limit compliance was very good for both angler-caught and diver-caught species during the reporting period.

1/ Marine Resources Administrative Report No. 86-1.

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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

Sportfishing activity in southern California marine waters is a source of mortality for both local and migratory fish populations. To determine the extent that recreational fishing affects marine fish stocks, the Department of Fish and Game studied one segment of the recreational fishery: sport fishermen using privately owned, trailerable boats.

The major purposes of the study were to estimate fishing 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 comparison with future catch and effort trends; 2) evidence for adding, deleting or modifying current fishing regulations; 3) an indication of fishing pressure on various species; 4) and 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 decisions may be necessary.

OPERATIONS

Sampling Plan

The sampling plan consisted of a program of random, stratified field sampling at selected launch ramps, hoists, and boat-rental facilities in Santa Barbara, Ventura, Los Angeles, Orange and San Diego counties. Sampling was conducted on all weekends and holidays, and on randomly chosen weekdays in accordance with

available manpower. Field samplers remained at sampling sites from 1000 h 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, number of fishing poles used, and number of people angling or diving 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 water. All species posted with minimum size limits were measured for length frequency analysis.

Sampling Locations

Five 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 with a minimum size limit, for the 20 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 January 1 - March 31, 1983 quarter, 19 launch ramps, five boat hoists, and four boat-rental locations were sampled 330 times. Samplers

interviewed 7114 anglers and 398 divers who spent 42,257 angler-trip hours ^{3/} and 535 diver hours ^{4/} in southern California coastal waters. Samplers examined 16,531 fishes, mollusks, and crustaceans of 106 species in the angler catch, along with 533 filleted fishes and 14 fishes which could not be identified to species due to time constraints or the condition in which the fish were landed (Tables 1 and 2). In the sampled diver catch, 1508 organisms of 39 species plus 10 unidentified fish, 10 unidentified filleted fish, and 34 unidentified invertebrates were examined.

Effort

An estimated 29,400 angler days were expended by southern California sport fishermen between January 1 and March 31, 1983 (Tables 3 and 4). This level of angling effort represented a 56% decline from the 5200 angler days expended during the 1982 January - March quarter. Weather undoubtedly had a depressing effect on angling effort, with unusually violent winter storms occurring through much of March. The distribution of angling effort among the five southern California counties was substantially different from the prior two winter quarters; Los Angeles County, with 34% of the angler effort, did not dominate the southern California region as in the past. San Diego County led Los Angeles with 35% of the effort. This change may indicate that Los Angeles County angling effort was

^{3/} The unit of angler effort is 1 hour of trip time per angler. Adjustments are made for those using more than one fishing pole concurrently.

^{4/} The unit of dive effort is 1 hour spent underwater.

simply more severely affected by the winter storms than its more southerly counterpart, or that the large protected bays in San Diego County provided more days of safe angling despite inclement weather. Orange County maintained a 20% share of angling effort and 11% was recorded for Santa Barbara and Ventura counties. These three counties supported nearly the same proportions of winter-quarter angling effort as has been recorded during the previous two winter quarters.

Diving effort also seems to have been both severely curtailed and redirected by winter storms (Tables 5 and 6). The 1800 diver hours of effort represented only 60% of the diver effort expended in January - March 1982. San Diego County, at 39%, had the largest share of diving; Santa Barbara/Ventura counties were next with 30%, Los Angeles County had 19% and Orange County had 12%. The nearly equitable distribution of diving effort among the four county units, as recorded during the past 2 years during the January - March quarters, was disrupted by the unusual pattern and occurrence of winter storms. Los Angeles and Orange counties also had relatively low levels of diver effort as a result of an almost complete coastal closure for the sport take of abalone.

Catch

An estimated 69,000 fishes and other organisms were landed by anglers in southern California and an estimated 5200 fishes and invertebrates were landed by divers. The combined total, represented less than half the combined landings of anglers and divers during the 1982 winter quarter.

Thirty-six species of fishes and invertebrates made up 95% of the combined angler/diver catch (Table 2). The remaining 5% of the combined catch was composed of 79 species.

Forty-three percent of the estimated angler catch was composed of two species: white croaker, Genyonemus lineatus (16,000 landed) and Pacific mackerel, Scomber japonicus (14,000 landed). These two species represented at least 40% of the estimated angler catch during the January - March period for the past 2 years. Thirty-three rockfish species, Sebastes spp., comprised an estimated 16% of the angler catch. Blue rockfish, S. mystinus; bocaccio, S. paucispinus; greenspotted rockfish, S. chlorostictus; olive rockfish, S. serranoides; and copper rockfish, S. caurinus; were the five most abundant rockfish species, and comprised 42% of the estimated rockfish landings. Among the preferred gamefish species, the Paralabrax sea bass species were the only fishes landed in significant quantities. The three bass species composed 13% of the total angler catch. Over half of these were barred sand bass, Paralabrax nebulifer.

The diver catch of 5200 organisms was little more than half the estimated diver catch recorded for the previous (1982) January - March quarter. The relatively low diver catch totals this year were indicative of the harsh oceanic conditions prevalent throughout the period.

Rock scallop, Hinnites multirugosus, was the major catch species, composing a third of the diver catch. Four species of abalone, Haliotis spp., constituted a quarter of the estimated diver catch; 58% of these were red abalone, H. rufescens.

Variation by County

An estimated 18,000 fishes, or 26% of the southern California catch total, were landed by anglers in Santa Barbara and Ventura counties (Table 7). White croaker was the leading species, and 42% of the southern California white croaker catch was landed in Ventura and Santa Barbara counties. Rockfishes, at 28%, were

a major component of the angler catch, and composed nearly half the estimated southern California rockfish landings. Blue rockfish, copper rockfish, and green-spotted rockfish were the leading species making up 40% of the Santa Barbara/Ventura county rockfish landings.

Divers in Santa Barbara and Ventura counties landed 1300 organisms. Rock scallop was the leading species, making up 40% of the estimated diver catch.

Los Angeles County anglers landed 23,600 fishes, or 33% of the estimated southern California angler catch. White croaker was the leading species, followed closely by Pacific mackerel; these two species made up over half (54%) of the angler catch in Los Angeles County. Preferred gamefish species, including the Paralabrax basses, made up about 10% of the landings in the county. An estimated 960 organisms were landed by Los Angeles County divers. The estimated 368 rock scallops landed represented over a third of the catch by Los Angeles County divers. Spiny lobster, Panulirus interruptus, comprised the second largest portion of the diver catch, at 15%.

Orange County anglers landed an estimated 8000 fishes, lowest catch total among the five southern California counties. Pacific mackerel was the leading species at 18%, while white croaker comprised 14% of the county's landings. The combined catch of Paralabrax basses made up 17% of the Orange County catch. The diver catch in Orange County was dominated by rock scallop, composing nearly 80% of the catch. Abalone were absent in the sampled catch; probably as a result of the extensive coastal abalone sport closure in Orange County.

San Diego anglers landed 20,400 fishes or 30% of the southern California angler catch. Pacific mackerel was the leading species, making up 29% of the San Diego landings. Among the preferred gamefish species, the three Paralabrax

basses were landed in larger quantities than elsewhere in southern California. Sixty percent of the southern California Paralabrax catch was made in San Diego County. Among the three bass species, barred sand bass was the biggest catch component, at 62%.

Red abalone and green abalone, H. fulgens, landed by divers in San Diego County represented more than 70% of the estimated southern California abalone catch. Rock scallop and California sheephead, Semicossyphus pulcher, were the two leading catch components. Each provided 15% of the estimated San Diego County diver catch. Spiny lobster constituted a relatively small (4%) portion of the estimated diver catch, a situation at least partially attributed to the fact that lobster diving is primarily a nocturnal activity, and the private-boat sport fishing survey is conducted only during daylight hours.

Length Frequencies

Length-frequency data (Table 8, Figures 1-7) indicate that angler size-limit compliance was very good for the three Paralabrax species. The 93% average for the three species represents a 2% increase over the previous (January - March 1982) winter quarter compliance rate for bass.

The angler size-limit compliance rate for Pacific bonito, Sarda chiliensis, improved considerably over previous quarters. From an examination of the bonito length frequency histogram (Figure 4), it becomes apparent that several year classes of bonito were recruited into the fishery. Modal lengths representing 1- and 2-year-old fish are readily apparent. It seems likely that angler size-limit compliance for Pacific bonito, under current regulations, will tend to vary considerably over time and will have a direct relationship with the recruitment of older age classes into the fishery.

Diver size-limit compliance for red abalone, green abalone and spiny lobster was nearly 100% (Figures 5-7), underscoring the fact that sport divers generally were more aware of the fishing regulations governing their activities and were, as a group, more inclined than anglers to follow them.

TABLE 1. List of Species Sampled from Southern California Private Boats; January through March 1983.

Scientific name	Common name	No. sampled
<u>Fishes</u>		
<i>Alopias vulpinus</i>	common thresher	3
<i>Amphistichus argenteus</i>	barred surfperch	6
<i>Anisotremus davidsonii</i>	sargo	24
<i>Atherinops affinis</i>	topsmelt	4
<i>Atherinopsis californiensis</i>	jacksmelt	142
<i>Atractoscion nobilis</i>	white seabass	10
<i>Balistes polylepis</i>	finescale triggerfish	1
<i>Caulolatilus princeps</i>	ocean whitefish	230
<i>Cephaloscyllium ventriosum</i>	swell shark	1
<i>Cheilotrema saturnum</i>	black croaker	12
<i>Chromis punctipinnis</i>	blacksmith	4
<i>Citharichthys sordidus</i>	Pacific sanddab	353
<i>C. stigmaeus</i>	speckled sanddab	2
<i>Cymatogaster aggregata</i>	shiner surfperch	1
<i>Damalichthys vacca</i>	pile surfperch	8
<i>Embiotoca jacksoni</i>	black surfperch	398
<i>E. lateralis</i>	striped surfperch	6
<i>Genyonemus lineatus</i>	white croaker	3,520
<i>Girella nigricans</i>	opaleye	512
<i>Halichoeres semicinctus</i>	rock wrasse	20
<i>Heterodontus francisci</i>	horn shark	2
<i>Heterostichus rostratus</i>	giant kelpfish	15
<i>Hippoglossina stomata</i>	bigmouth sole	5
<i>Hydrolagus colliei</i>	ratfish	1
<i>Hyperprosopon argenteum</i>	walleye surfperch	46
<i>H. ellipticum</i>	silver surfperch	1
<i>Hypsopsetta guttulata</i>	diamond turbot	39
<i>Hypsurus caryi</i>	rainbow surfperch	11
<i>Isurus oxyrinchus</i>	bonito shark	1
<i>Medialuna californiensis</i>	halfmoon	184
<i>Menticirrhus undulatus</i>	California corbina	6
<i>Merluccius productus</i>	Pacific hake	3
<i>Mustelus californicus</i>	gray smoothhound	17
<i>M. henlei</i>	brown smoothhound	3
<i>Myliobatis californica</i>	bat ray	4
<i>Neoclinus blanchardi</i>	sarcastic fringehead	1
<i>Ophiodon elongatus</i>	lingcod	24
<i>Oxyjulis californica</i>	senorita	22
<i>Paralabrax clathratus</i>	kelp bass	732
<i>P. maculatofasciatus</i>	spotted sand bass	303
<i>P. nebulifer</i>	barred sand bass	1,066
<i>Paralichthys californicus</i>	California halibut	63
<i>Parophrys vetulus</i>	English sole	1

Table 1 - cont'd.

Scientific name	Common name	No. sampled
<i>Phanerodon furcatus</i>	white surfperch	44
<i>Platyrrhinoidis triseriata</i>	thornback	1
<i>Pleuronichthys verticalis</i>	hornyhead turbot	1
<i>Porichthys myriaster</i>	specklefin midshipman	2
<i>Prionace glauca</i>	blue shark	5
<i>Rhacochilus toxotes</i>	rubberlip surfperch	58
<i>Rhinobatos productus</i>	shovelnose guitarfish	8
<i>Roncador stearnsii</i>	spotfin croaker	16
<i>Sarda chiliensis</i>	Pacific bonito	491
<i>Sardinops sagax caeruleus</i>	Pacific sardine	4
<i>Scomber japonicus</i>	Pacific mackerel	3,565
<i>Scorpaena guttata</i>	Sculpin	337
<i>Scorpaenichthys marmoratus</i>	cabezon	56
<i>Sebastes atrovirens</i>	kelp rockfish	94
<i>S. auriculatus</i>	brown rockfish	74
<i>S. babcocki</i>	redbanded rockfish	1
<i>S. carnatus</i>	gopher rockfish	63
<i>S. caurinus</i>	copper rockfish	241
<i>S. chlorostictus</i>	greenspotted rockfish	263
<i>S. chrysomelas</i>	black and yellow rockfish	7
<i>S. constellatus</i>	starry rockfish	163
<i>S. dallii</i>	calico rockfish	2
<i>S. elongatus</i>	greenstriped rockfish	78
<i>S. entomelas</i>	widow rockfish	18
<i>S. flavidus</i>	yellowtail rockfish	6
<i>S. gilli</i>	bronzespotted rockfish	3
<i>S. goodei</i>	chilipepper	94
<i>S. heluomaculatus</i>	rosethorn rockfish	1
<i>S. hopkinsi</i>	squarespot rockfish	20
<i>S. levis</i>	cowcod	5
<i>S. macdonaldi</i>	Mexican rockfish	4
<i>S. miniatus</i>	vermilion rockfish	99
<i>S. mystinus</i>	blue rockfish	271
<i>S. ovalis</i>	speckled rockfish	248
<i>S. paucispinis</i>	bocaccio	319
<i>S. pinniger</i>	canary rockfish	10
<i>S. rastrelliger</i>	grass rockfish	54
<i>S. rosaceus</i>	rosy rockfish	88
<i>S. rosenblatti</i>	greenblotched rockfish	8
<i>S. ruberrimus</i>	yelloweye rockfish	1
<i>S. rubrivinctus</i>	flag rockfish	54
<i>S. rufus</i>	bank rockfish	15
<i>S. semicinctus</i>	halfbanded rockfish	7
<i>S. serranoides</i>	olive rockfish	194
<i>S. serriceps</i>	treefish	36
<i>S. umbrosus</i>	honeycomb rockfish	11
<i>Semicossyphus pulcher</i>	California sheephead	486

Table 1 - cont'd.

Scientific name	Common name	No. sampled
<i>Seriola lalandi</i>	yellowtail	9
<i>Seriphus politus</i>	queenfish	294
<i>Sphyræna argentea</i>	California barracuda	5
<i>Squalus acanthias</i>	spiny dogfish	34
<i>Stereolepis gigas</i>	giant sea bass	1
<i>Synodus lucioceps</i>	California lizardfish	72
<i>Trachurus symmetricus</i>	jack mackerel	47
<i>Triakis semifasciata</i>	leopard shark	8
<i>Umbrina roncadore</i>	yellowfin croaker	165
<i>Urolophus halleri</i>	round stingray	1
<i>Xystreurys liolepis</i>	fantail sole	1
-	unidentified fish	19
-	unidentified filleted fish	336
<i>Sebastes</i> spp.	unidentified rockfish	5
" "	unidentified rockfish fillets	207

Mollusks and Crustaceans

<i>Astraea undosa</i>	wavy top	1
<i>Cancer antennarius</i>	rock crab	17
<i>C. productus</i>	red crab	1
<i>Haliotis corrugata</i>	pink abalone	50
<i>H. cracherodii</i>	black abalone	16
<i>H. fulgens</i>	green abalone	94
<i>H. rufescens</i>	red abalone	207
<i>H. sorenseni</i>	white abalone	2
<i>Hinnites multirugosus</i>	rock scallop	527
<i>Kelletia kelletii</i>	Kellet's whelk	1
<i>Loligo opalescens</i>	market squid	150
<i>Loxorhynchus grandis</i>	sheep crab	1
<i>Panulirus interruptus</i>	California spiny lobster	134
<i>Mytilus</i> spp.	mussel	725
<i>Octopus</i> spp.	unidentified octopus	2
Brachyura	unidentified crab	6
Mollusca	unidentified mollusk	10
Crustacea	unidentified crustaceans	10

Table 1 - cont'd.

<u>Scientific name</u>	<u>Common name</u>	<u>No. sampled</u>
<u>Echinoderms and Coelenterates</u>		
<i>Strongylocentrotus franciscanus</i>	giant red urchin	35
<i>Tivela stultorum</i>	pismo clam	6
<i>Pisaster</i> spp.	sea star	4
Coelenterata	unidentified coelenterate	20

TABLE 2. Most Commonly Landed Species; January through March 1983.

Scientific name	Common name	No. sampled
<u>Fishes</u>		
<i>Scomber japonicus</i>	Pacific mackerel	3,565
<i>Genyonemus lineatus</i>	white croaker	3,520
<i>Paralabrax nebulifer</i>	barred sand bass	1,066
<i>P. clathratus</i>	kelp bass	732
<i>Girella nigricans</i>	opaleye	511
<i>Sarda chiliensis</i>	Pacific bonito	491
<i>Semicossyphus pulcher</i>	California sheephead	486
<i>Embiotoca jacksoni</i>	black surfperch	398
<i>Citharichthys sordidus</i>	Pacific sanddab	353
<i>Scorpaena guttata</i>	sculpin	337
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	303
<i>Seriphus politus</i>	queenfish	294
<i>Sebastes mystinus</i>	blue rockfish	271
<i>S. chlorostictus</i>	greenspotted rockfish	263
<i>S. ovalis</i>	speckled rockfish	248
<i>S. caurinus</i>	copper rockfish	241
<i>Caulolatilus princeps</i>	ocean whitefish	230
<i>Sebastes serranoides</i>	olive rockfish	194
<i>Medialuna californiensis</i>	halfmoon	184
<i>Umbrina roncadore</i>	yellowfin croaker	165
<i>Sebastes constellatus</i>	starry rockfish	163
<i>Atherinopsis californiensis</i>	jacksmelt	142
<i>Sebastes miniatus</i>	vermilion rockfish	99
<i>S. atrovirens</i>	kelp rockfish	94
<i>S. goodei</i>	chilipepper	94
<i>S. rosaceus</i>	rosy rockfish	88
<i>S. elongatus</i>	greenstriped rockfish	78
<i>S. auriculatus</i>	brown rockfish	74
<i>Synodus lucioceps</i>	California lizardfish	72
<i>Sebastes carnatus</i>	gopher rockfish	63
<i>Paralichthys californicus</i>	California halibut	63
<u>Mollusks and Crustaceans</u>		
<i>Hinnites multirugosus</i>	rock scallop	527
<i>Haliotis rufescens</i>	red abalone	207
<i>Loligo opalescens</i>	market squid	150
<i>Panulirus interruptus</i>	California spiny lobster	134
<i>Haliotis fulgens</i>	green abalone	94

TABLE 3. Catch and Effort Estimates for Anglers; January through March 1983.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Angler parties					
weekend	987	2,847	1,653	2,573	8,060
weekday	387	892	760	2,074	4,113
total	<u>1,374</u>	<u>3,739</u>	<u>2,413</u>	<u>4,647</u>	<u>12,173</u>
Angler days					
weekend	2,508	7,449	4,084	6,104	20,145
weekday	945	2,137	1,800	4,358	9,240
total	<u>3,453</u>	<u>9,586</u>	<u>5,884</u>	<u>10,462</u>	<u>29,385</u>
Angler-trip-hours					
weekend	12,981	45,985	24,164	34,952	118,082
weekday	5,619	12,620	11,402	26,926	56,567
total	<u>18,600</u>	<u>58,605</u>	<u>35,566</u>	<u>61,878</u>	<u>174,649</u>
Total fishes landed					
weekend	10,492	19,067	6,291	11,759	47,609
weekday	7,513	3,519	1,715	8,640	21,387
total	<u>18,005</u>	<u>22,586</u>	<u>8,006</u>	<u>20,399</u>	<u>68,996</u>
No. rockfishes landed					
weekend	4,100	2,466	915	1,323	8,804
weekday	1,015	238	201	735	2,189
total	<u>5,115</u>	<u>2,704</u>	<u>1,116</u>	<u>2,058</u>	<u>10,993</u>
<i>Atractoscion nobilis</i> (white seabass)					
	3	0	12	55	70
<i>Caulolatilus princeps</i> (ocean whitefish)					
	170	165	16	572	923
<i>Citharichthys sordidus</i> (Pacific sanddab)					
	465	87	199	566	1,317
<i>Embiotoca jacksoni</i> (black surfperch)					
	363	638	87	46	1,134
<i>Genyonemus lineatus</i> (white croaker)					
	6,674	6,894	1,131	1,209	15,908
<i>Girella nigricans</i> (opaleye)					
	155	1,559	98	160	1,972

Table 3 - cont'd.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
<i>Medialuna californiensis</i> (halfmoon)	15	451	120	111	697
<i>Oncorhynchus tshawytscha</i> (king salmon)	0	0	0	0	0
<i>Ophiodon elongatus</i> (lingcod)	21	0	0	8	29
<i>Paralabrax clathratus</i> (kelp bass)	391	604	433	896	2,324
<i>P. maculatofasciatus</i> (spotted sand bass)	3	16	201	1,117	1,337
<i>P. nebulifer</i> (barred sand bass)	140	900	688	3,256	4,984
<i>Paralichthys californicus</i> (California halibut)	42	87	52	95	276
<i>Sarda chiliensis</i> (Pacific bonito)	631	668	418	514	2,231
<i>Scomber japonicus</i> (Pacific mackerel)	1,314	5,441	1,455	5,933	14,143
<i>Scorpaena guttata</i> (sculpin)	246	481	167	508	1,402
<i>Sebastes atrovirens</i> (kelp rockfish)	145	109	2	85	341
<i>S. auriculatus</i> (brown rockfish)	220	24	22	0	266
<i>S. caurinus</i> (copper rockfish)	700	45	0	45	790
<i>S. chlorostictus</i> (greenspotted rockfish)	403	153	101	270	927
<i>S. goodei</i> (chilipepper)	129	129	12	30	300
<i>S. miniatus</i> (vermillion rockfish)	142	49	28	83	302

Table 3 - cont'd.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
<i>Sebastes mystinus</i> (blue rockfish)	947	52	34	47	1,080
<i>S. paucispinus</i> (bocaccio)	288	459	161	118	1,026
<i>S. rastrelliger</i> (grass rockfish)	124	143	16	8	291
<i>S. serranoides</i> (olive rockfish)	209	290	30	242	771
<i>Semicossyphus pulcher</i> (California sheephead)	96	203	188	763	1,250
<i>Seriola lalandi</i> (yellowtail)	0	26	0	4	30
<i>Seriphus politus</i> (queenfish)	0	583	431	187	1,201
<i>Sphyraena argentea</i> (California barracuda)	3	7	0	8	18
<i>Thunnus alalunga</i> (albacore)	0	0	0	0	0
<i>Trachurus symmetricus</i> (jack mackerel)	39	58	18	22	137

TABLE 4. Standard Error of the Estimates for Anglers: January through March 1983.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Angler parties	137	314	218	732	838
Angler days	341	764	534	1,617	1,897
Angler-trip-hours	2,197	5,206	3,609	10,899	12,797
Total fishes landed	4,800	2,070	857	3,690	6,456
No. rockfishes landed	957	498	218	448	1,188
albacore	0	0	0	0	0
barred sand bass	44	129	87	832	847
black surfperch	124	145	25	24	193
blue rockfish	329	21	16	29	331
bocaccio	89	112	54	34	156
brown rockfish	73	8	20	0	76
California barracuda	2	4	0	5	7
California halibut	7	32	30	28	53
California sheephead	23	56	31	308	315
chilipepper	76	82	4	100	112
copper rockfish	177	28	0	26	181
grass rockfish	42	100	14	6	110
greenspotted rockfish	155	62	33	137	218
halfmoon	5	81	58	92	136
jack mackerel	13	33	6	10	37
kelp bass	110	80	81	234	283
kelp rockfish	58	56	1	61	101
king salmon	0	0	0	0	0
lingcod	9	0	0	4	10
ocean whitefish	41	85	8	256	273
olive rockfish	34	129	12	104	170
opaleye	51	469	35	112	486
Pacific bonito	208	196	174	289	442
Pacific mackerel	455	831	237	1,610	1,883
Pacific sanddab	216	40	125	253	357
queenfish	0	267	325	112	436
sculpin	51	88	34	170	201
spotted sand bass	2	7	53	258	263
vermillion rockfish	62	30	8	29	75
white croaker	4,866	984	306	523	5,001
white seabass	2	0	4	55	55
yellowtail	0	14	0	4	14

TABLE 5. Catch and Effort Estimates for Divers; January through March 1983.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Diver parties					
weekend	121	114	51	204	490
weekday	0	0	14	92	106
total	<u>121</u>	<u>114</u>	<u>65</u>	<u>296</u>	<u>596</u>
Diver days					
weekend	297	237	132	532	1,198
weekday	0	0	42	239	281
total	<u>297</u>	<u>237</u>	<u>174</u>	<u>771</u>	<u>1,479</u>
Diver-hours					
weekend	548	347	168	564	1,627
weekday	0	0	42	156	198
total	<u>548</u>	<u>347</u>	<u>210</u>	<u>720</u>	<u>1,825</u>
No. organisms landed					
weekend	1,330	960	508	2,099	4,897
weekday	0	0	140	184	324
total	<u>1,330</u>	<u>960</u>	<u>648</u>	<u>2,283</u>	<u>5,221</u>
<i>Haliotis corrugata</i> (pink abalone)					
	75	18	0	73	166
<i>H. cracherodii</i> (black abalone)					
	48	0	0	0	48
<i>H. fulgens</i> (green abalone)					
	21	28	0	290	339
<i>H. rufescens</i> (red abalone)					
	93	35	0	644	772
<i>Hinnites multirugosus</i> (rock scallop)					
	520	368	507	329	1,724
<i>Panulirus interruptus</i> (California spiny lobster)					
	196	142	2	87	427
<i>Paralabrax clathratus</i> (kelp bass)					
	38	56	10	119	223
<i>Semicossyphus pulcher</i> (California sheephead)					
	169	21	67	332	589

TABLE 6. Standard Error of the Estimates for Divers; January through March 1983.

	Santa Barbara/ Ventura Counties	Los Angeles County	Orange County	San Diego County	Total
Diver parties	21	28	18	79	88
Diver days	59	59	52	214	236
Diver-hours	90	103	66	185	239
No. organisms landed	257	373	221	587	774
black abalone	29	0	0	0	29
California sheephead	56	12	14	122	135
California spiny lobster	61	51	1	34	87
green abalone	17	19	0	188	190
kelp bass	13	28	4	33	45
pink abalone	34	12	0	33	49
red abalone	49	30	0	149	159
rock scallop	110	148	197	129	299

TABLE 7. Ten Most Commonly Landed Species in Each County; January through March 1983.

County	Rank	Scientific name	Common name
Santa Barbara/ Ventura	1.	<i>Genyonemus lineatus</i>	white croaker
	2.	<i>Scomber japonicus</i>	Pacific mackerel
	3.	<i>Sebastes mystinus</i>	blue rockfish
	4.	<i>S. caurinus</i>	copper rockfish
	5.	<i>Sarda chiliensis</i>	Pacific bonito
	6.	<i>Hinnites multirugosus</i>	rock scallop
	7.	<i>Citharichthys sordidus</i>	Pacific sanddab
	8.	<i>Paralabrax clathratus</i>	kelp bass
	9.	<i>Embiotoca jacksoni</i>	black surfperch
	10.	<i>Sebastes ovalis</i>	speckled rockfish
Los Angeles	1.	<i>Genyonemus lineatus</i>	white croaker
	2.	<i>Scomber japonicus</i>	Pacific mackerel
	3.	<i>Girella nigricans</i>	opaleye
	4.	<i>Paralabrax nebulifer</i>	barred sand bass
	5.	<i>Embiotoca jacksoni</i>	black surfperch
	6.	<i>Paralabrax clathratus</i>	kelp bass
	7.	<i>Seriphus politus</i>	queenfish
	8.	<i>Sarda chiliensis</i>	Pacific bonito
	9.	<i>Medialuna californiensis</i>	halfmoon
	10.	<i>Sebastes paucispinus</i>	bocaccio
Orange	1.	<i>Scomber japonicus</i>	Pacific mackerel
	2.	<i>Genyonemus lineatus</i>	white croaker
	3.	<i>Paralabrax nebulifer</i>	barred sand bass
	4.	<i>Hinnites multirugosus</i>	rock scallop
	5.	<i>Paralabrax clathratus</i>	kelp bass
	6.	<i>Loligo opalescens</i>	market squid
	7.	<i>Semicossyphus pulcher</i>	California sheephead
	8.	<i>Sarda chiliensis</i>	Pacific bonito
	9.	<i>Paralabrax maculatofasciatus</i>	spotted sand bass
	10.	<i>Seriphus politus</i>	queenfish
San Diego	1.	<i>Scomber japonicus</i>	Pacific mackerel
	2.	<i>Paralabrax nebulifer</i>	barred sand bass
	3.	<i>P. maculatofasciatus</i>	spotted sand bass
	4.	<i>Semicossyphus pulcher</i>	California sheephead
	5.	<i>Paralabrax clathratus</i>	kelp bass
	6.	<i>Haliotis rufescens</i>	red abalone
	7.	<i>Genyonemus lineatus</i>	white croaker
	8.	<i>Caulolatilus princeps</i>	ocean whitefish
	9.	<i>Umbrina roncadore</i>	yellowfin croaker
	10.	<i>Citharichthys sordidus</i>	Pacific sanddab

TABLE 8. Occurrence of Sublegal-Size Fishes in Examined Catches; January through March 1983.

Scientific name	Common name	No. examined	% legal
<u>Fishes</u>			
<i>Paralabrax clathratus</i>	kelp bass	575	93
<i>P. maculatofasciatus</i>	spotted sand bass	270	94
<i>P. nebulifer</i>	barred sand bass	905	93
<i>Sarda chiliensis</i>	Pacific bonito*	343	23
<u>Mollusks and Crustaceans</u>			
<i>Haliotis fulgens</i>	green abalone	93	99
<i>Haliotis rufescens</i>	red abalone	203	93
<i>Panulirus interruptus</i>	California spiny lobster	128	98

*Sport anglers were allowed to keep up to two Pacific bonito below the 61 cm (24 in.) fork length, minimum size limit from January through February 29, 1983. After March 1, 1983, five bonito per angler under 61 cm fork length (or weighing less than 2.3 kg {5 lb}) were allowed in possession. No attempt was made to quantify the percentage of undersized fish landed as part of legal bag limits.

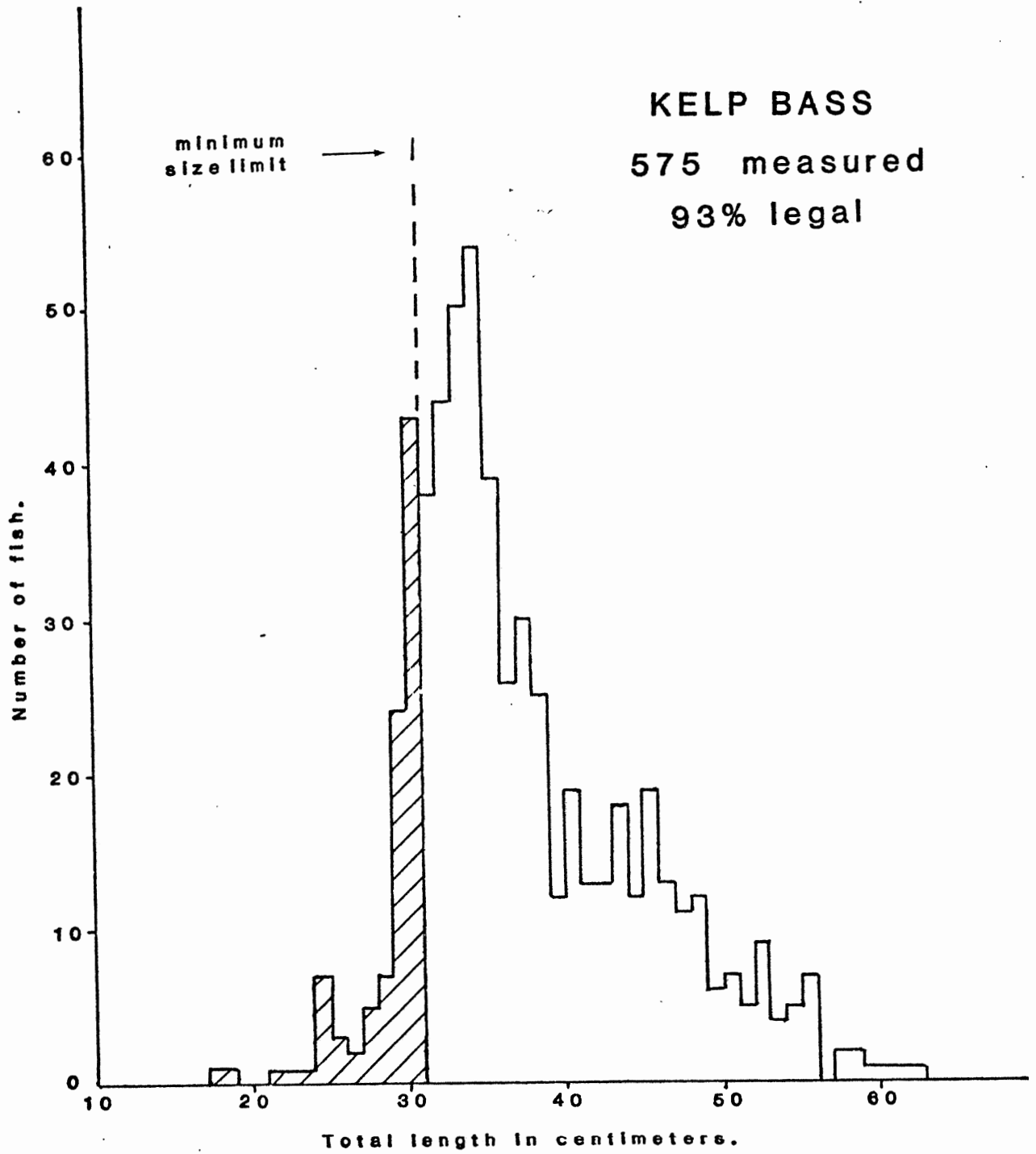


FIGURE 1. Length frequency of kelp bass.

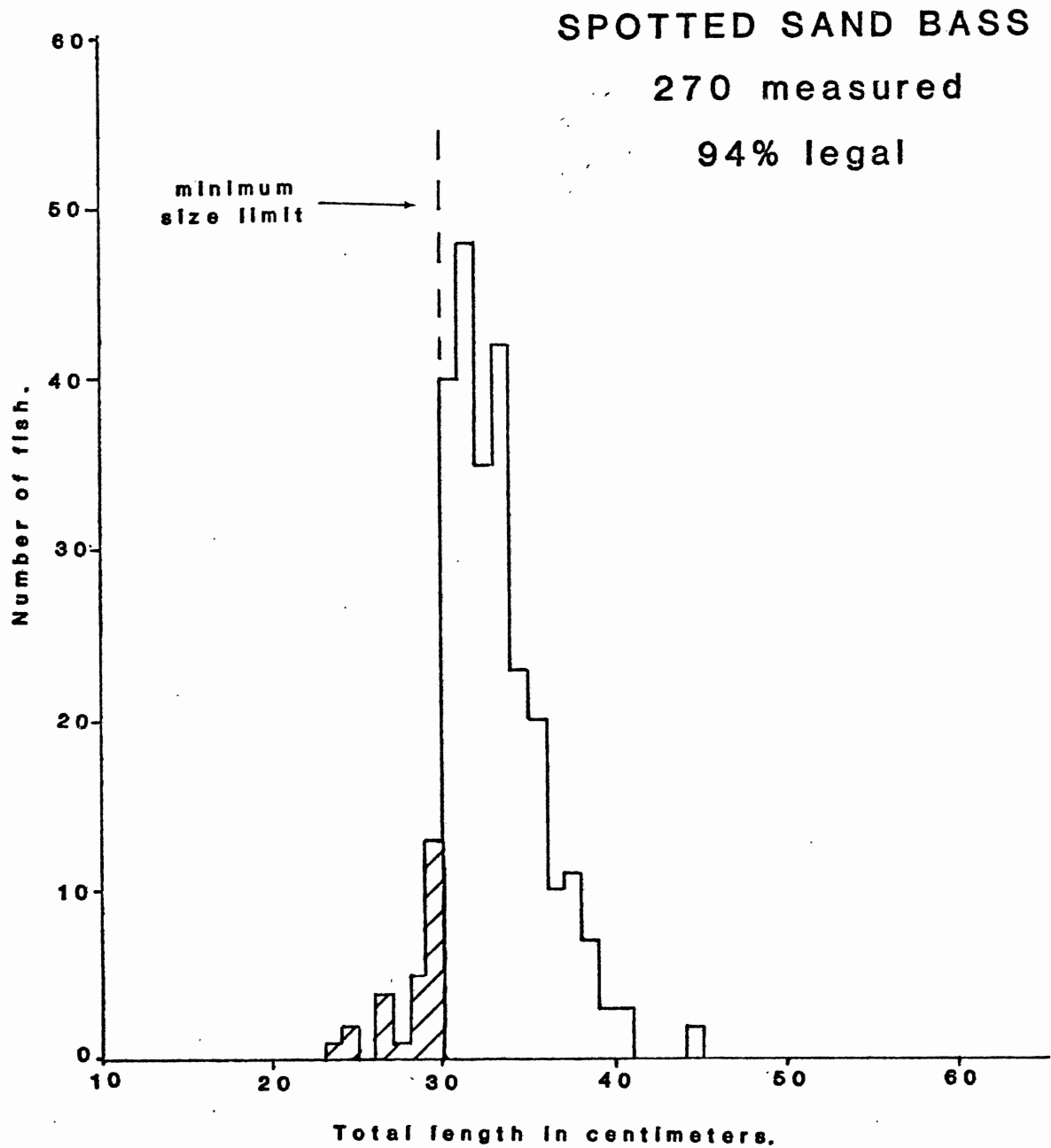


FIGURE 2. Length frequency of spotted sand bass.

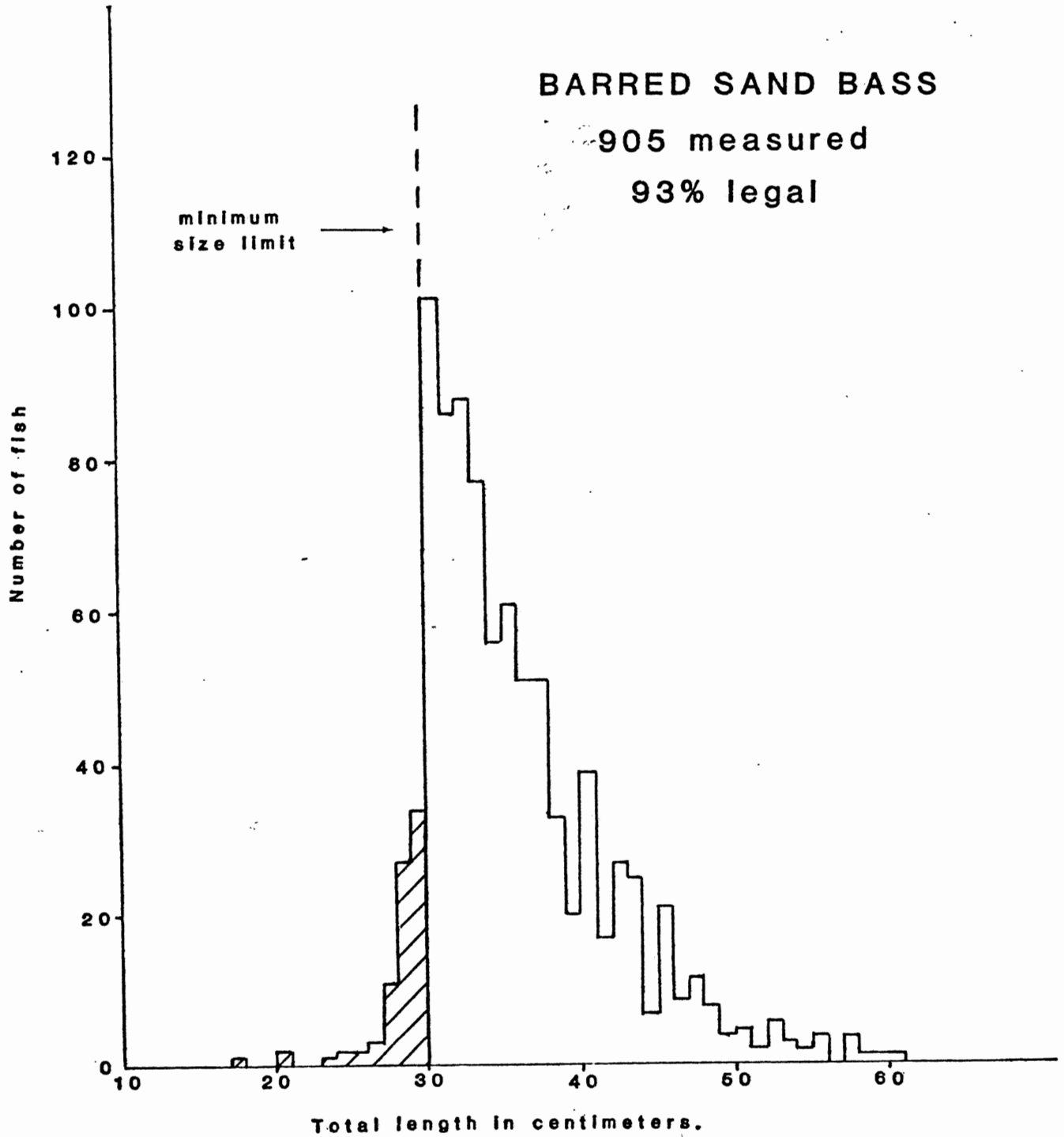


FIGURE 3. Length frequency of barred sand bass.

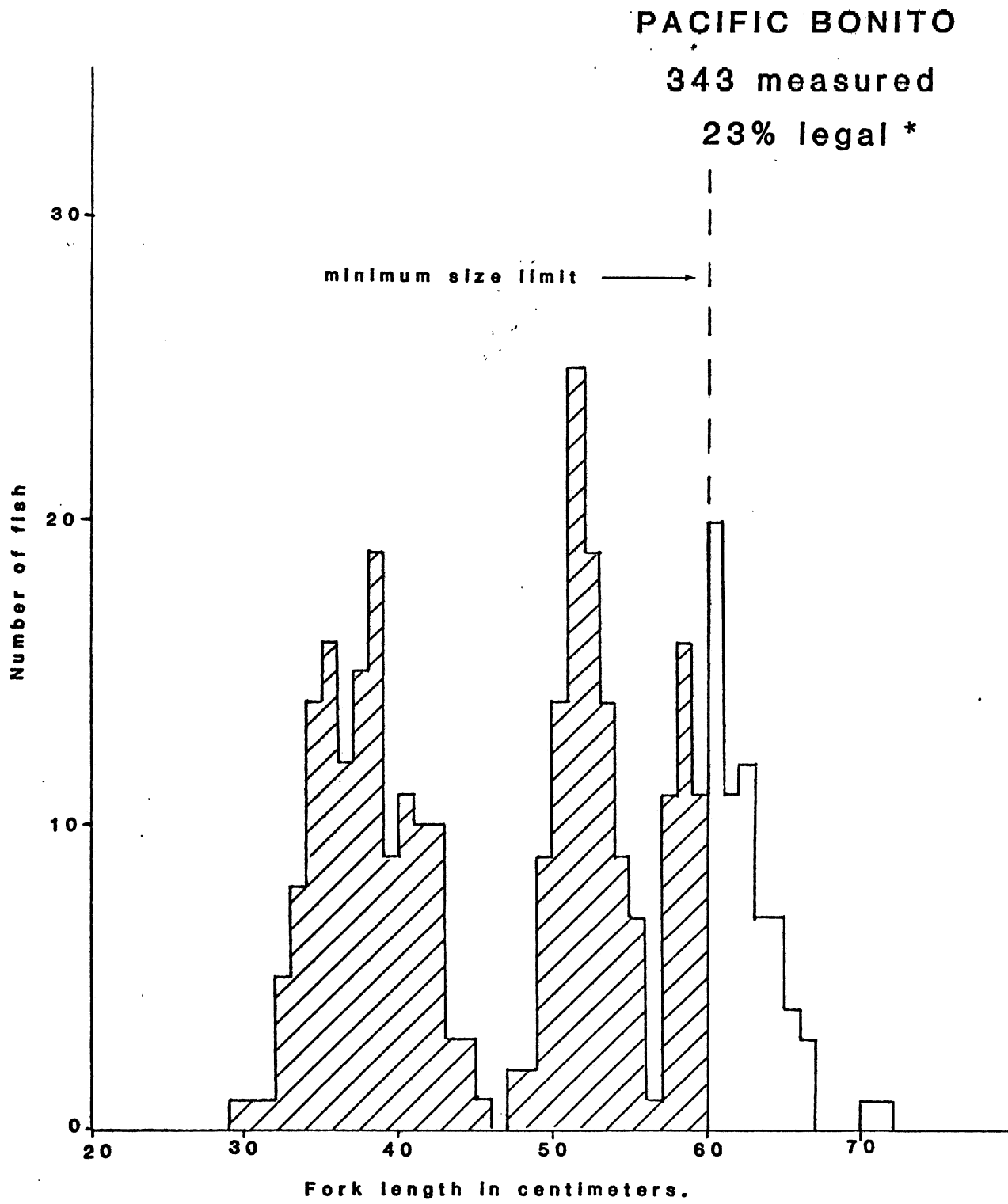


FIGURE 4. Length frequency of Pacific bonito.

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

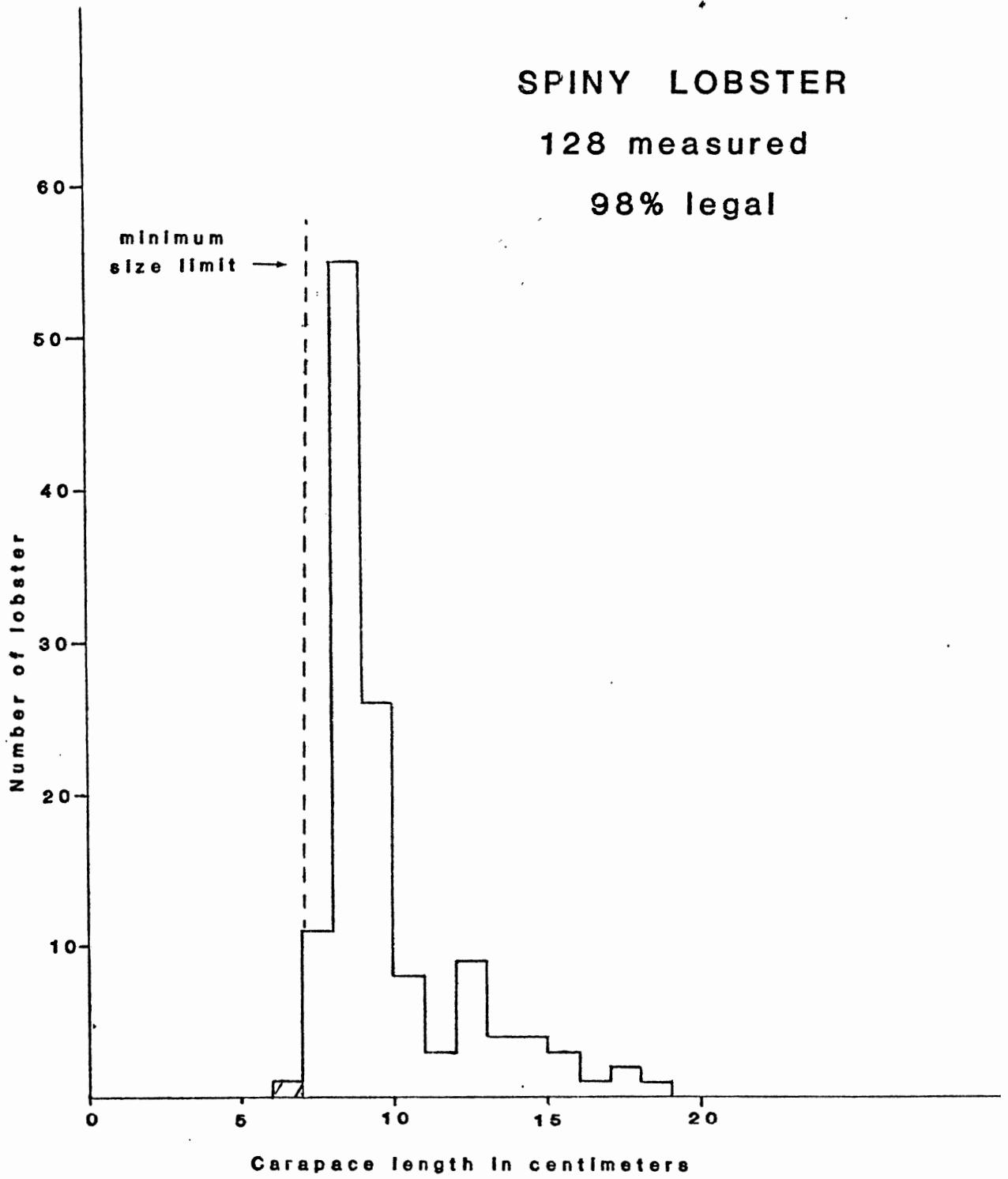


FIGURE 5. Length frequency of spiny lobster.

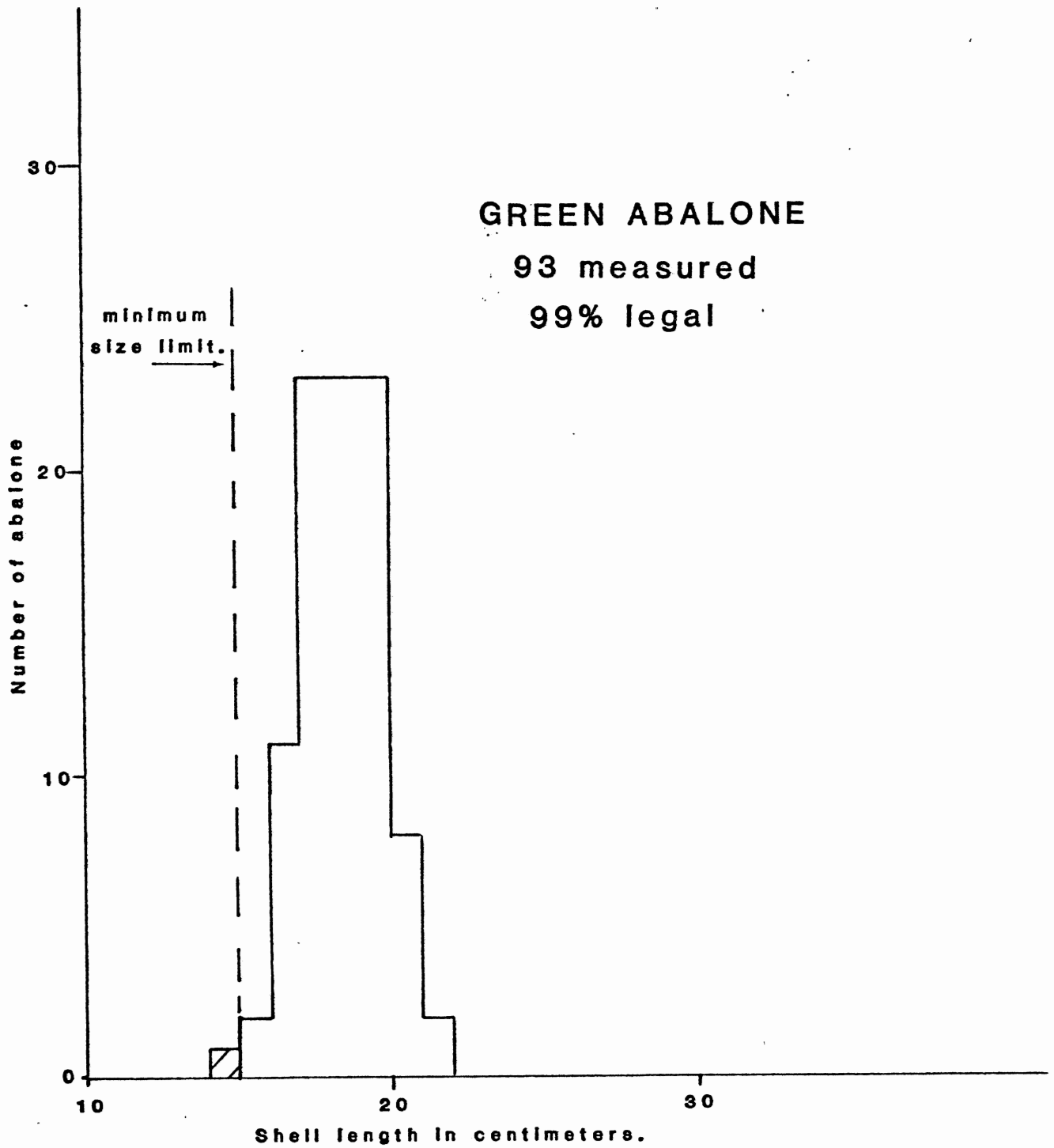


FIGURE 6. Length frequency of green abalone

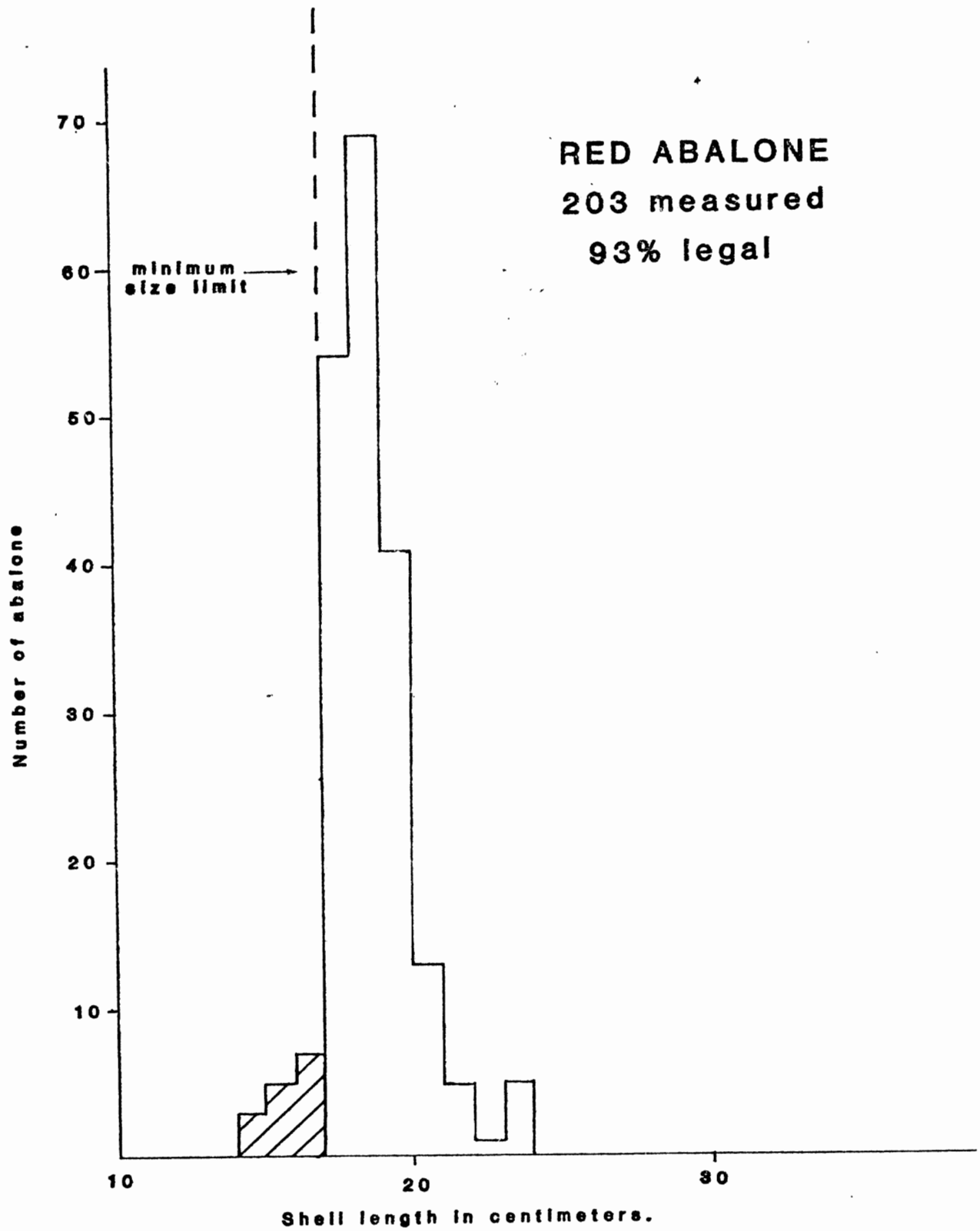


FIGURE 7. Length frequency of red abalone.