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DEPARTMENT OF FISH AND GAME

SOUTHERN CALIFORNIA MARINE SPORT FISHING
FROM PRIVATELY-OWNED BOATS; CATCH AND EFFORT
FOR JANUARY-MARCH 1981

by

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and

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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 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 139,000 organisms were landed by 45,000 anglers and 1,900 divers. The major components of the catch were Pacific mackerel, *Scomber japonicus*, 29,000 landed; white croaker, *Genyonemus lineatus*, 27,000 landed; and Pacific bonito, *Sarda chiliensis*, 13,000 landed. These three species comprised one-half of the total catch.

Anglers' compliance with size limit regulations was variable. Approximately 87% of all measured bass, *Paralabrax* spp., were legal size, but only 60% of the California halibut, *Paralichthys californicus*, were legal size. Divers showed much better compliance with the size limit regulations: 96% of all red abalone, *Haliotis rufescens*, were legal size.

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INTRODUCTION

Recreational fishing activities in southern California marine waters affect the abundance of local fish populations and also influence 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 constraint 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 action that 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 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 the sample locations from 1000 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, crabs, and lobsters in possession (no data were requested about species caught but not kept). An attempt was made to measure all species with legal 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. The information presented in this report is for Los Angeles, Orange, and San Diego 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. Estimates were calculated separately for weekends and weekdays. Catch estimates were made for each species which has a legal minimum size limit, the twenty most commonly landed species, the *Sebastes* genus, and for the total number of fish landed.

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 January 1 - March 31, 1981 quarter, 15 launch ramps, 2 boat hoists, and 3 boat rental locations were sampled 288 times. Samplers interviewed 10,115 anglers and 400 divers who spent 61,980 angler-trip-hours^{4/}

^{4/} 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.

and 489 diver-hours^{5/} in southern California coastal waters. Samplers examined 26,078 fishes, molluscs, and crustaceans of 115 species in the angler catch, along with 1,095 filleted fishes whose species could not be determined (Tables 1 and 2). In the sampled diver catch, 1,140 organisms of 40 species, and 20 unidentified filleted fishes were examined.

Effort

Normally at this time of year, frequent storms curtail fishing activity. However, calm seas and low winds prevailed for most of the quarter, and fishermen took advantage of the favorable weather. An estimated 45,000 angler-days and 1,900 diver-days were expended during this period (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 the angler effort levels by county shows that Los Angeles County facilities received much heavier use than those in the other two counties. Approximately 23,000 angler-days were spent fishing in Los Angeles County; 9,000 in Orange County; and 13,000 in San Diego County (Tables 3-4).

Over half of the diving effort originated in San Diego County because the offshore habitat there is best suited to those species sought by divers. An estimated 900 diver-days were spent in San Diego County, 600 in Los Angeles County, and 400 in Orange County (Tables 5 and 6).

Catch

An estimated total of 134,000 fishes and other organisms were landed by southern California anglers, and an estimated 5,100 organisms were landed by divers.

Half of the angler catch was composed of only three species: Pacific mackerel, *Scomber japonicus*; white croaker, *Genyonemus lineatus*; and Pacific bonito, *Sarda chiliensis*. A large variety of rockfishes, *Sebastes* spp., was landed, contributing 18% of the estimated catch. Bass, *Paralabrax* spp.,

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

accounted for 11% of the catch; while other preferred sport fish species such as California halibut, *Paralichthys californicus*; California barracuda, *Sphyræna argentea*; white seabass, *Atractoscion nobilis*; and lingcod, *Ophiodon elongatus*, contributed only 1% of the catch.

The most commonly landed species in the diver catch was red abalone, *Haliotis rufescens*, with an estimated 1,600 landed. Abalone season was closed between mid-January and mid-March, and few abalone were landed during this time. Divers also landed an estimated 1,000 rock scallops, *Hinnites multirugosus*; 700 California sheephead, *Semicossyphus pulcher*; and 600 California spiny lobster, *Panulirus interruptus* (before the lobster season closed in mid-March).

Variation by County

More than twice as many fishes were landed by anglers in Los Angeles County (85,000) than in either of the other two counties sampled. White croaker and Pacific mackerel were tied for first place in the catch, both contributing 23%. Rockfishes and Pacific bonito each contributed approximately 15% of the catch. The remaining 24% of the catch was composed of a large variety of species. Approximately 6,000 preferred game fishes were landed, three-fourths of which were bass. Since two-thirds of the Los Angeles County coast was closed to abalone fishing, most divers sought California spiny lobster, scallop, and sheephead. An estimated total of 1,300 organisms was landed by divers.

Orange County angler landings were the lowest in the sampled area. Half of the estimated 16,600 fishes landed by anglers were white croaker, rockfishes, and Pacific mackerel. Less than 3,000 preferred game fishes were landed, nearly all of which were bass. Very little diving activity originated in Orange County, but the most common catch of the few diving parties was rock scallop.

An estimated 32,200 fishes were landed by anglers in San Diego County. Unlike the other two counties, white croaker was not the most commonly

landed fish (Table 7). Rockfishes contributed 25% of the estimated catch, bass 23%, and Pacific mackerel 20%. The catch of preferred game fishes was relatively high (8,000 landed), due mostly to the large number of bass landed. Diving success was better in San Diego County than in the other two counties, with approximately 2,700 organisms landed. Red abalone predominated in the catch.

LENGTH FREQUENCIES

Examination of length frequency data (Table 8, Figures 1-5) shows that a substantial number of sublegal-size fishes appeared in the sampled catches. The three bass species averaged 87% legal, while California halibut averaged only 60% legal. Few California barracuda and white seabass were measured, but most were sublegal size.

Divers paid close attention the size limit on red abalone (96% legal). The percentage of legal-size California spiny lobster landed was considerably lower than usual, but this might be due to the way that measurements are recorded in this survey: lengths are measured to the nearest half-centimeter, while the legal size limit is specified in inches. The minimum size limit (3.25 inches = 8.25 cm) falls precisely in the center of a half-centimeter group; therefore, those lobsters whose carapace measures between 8.25 and 8.5 centimeters are legal size, but may be recorded as sublegals.

TABLE 1. List of Species Sampled from Southern California Private Boats; January through March 1981.

Scientific name	Common name	No. sampled
<u>Fishes</u>		
<i>Alopias vulpinus</i>	common thresher	8
<i>Amphistichus argenteus</i>	barred surfperch	27
<i>Anisotremus davidsonii</i>	sargo	5
<i>Anoplopoma fimbria</i>	sablefish	86
<i>Artedius notospilotus</i>	bonyhead sculpin	1
<i>Atherinops affinis</i>	topsmelt	5
<i>Atherinopsis californiensis</i>	jacksmelt	152
<i>Atractoscion nobilis</i>	white seabass	27
<i>Balistes polylepis</i>	finescale triggerfish	1
<i>Caulolatilus princeps</i>	ocean whitefish	312
<i>Cheilotrema saturnum</i>	black croaker	12
<i>Chromis punctipinnis</i>	blacksmith	20
<i>Citharichthys sordidus</i>	Pacific sanddab	637
<i>Cymatogaster aggregata</i>	shiner surfperch	3
<i>Damalichthys vacca</i>	pile surfperch	28
<i>Decapterus hypodus</i>	Mexican scad	3
<i>Embiotoca jacksoni</i>	black surfperch	597
<i>E. lateralis</i>	striped surfperch	2
<i>Eopsetta jordani</i>	petrale sole	4
<i>Galeorhinus zyopterus</i>	soupfin shark	3
<i>Geryonemus lineatus</i>	white croaker	5,214
<i>Girella nigricans</i>	opaleye	208
<i>Halichoeres semicinctus</i>	rock wrasse	7
<i>Heterodontus francisci</i>	horn shark	3
<i>Heterostichus rostratus</i>	giant kelpfish	30
<i>Hippoglossina stomata</i>	bigmouth sole	2
<i>Hydrolagus colliei</i>	ratfish	2
<i>Hyperprosopon argenteum</i>	walleye surfperch	59
<i>H. ellipticum</i>	silver surfperch	5
<i>Hypsopsetta guttulata</i>	diamond turbot	33
<i>Hypsurus caryi</i>	rainbow surfperch	27
<i>Hypsypops rubicundus</i>	garibaldi	1
<i>Leptocottus armatus</i>	Pacific staghorn sculpin	2
<i>Medialuna californiensis</i>	halfmoon	429
<i>Menticirrhus undulatus</i>	California corbina	3
<i>Merluccius productus</i>	Pacific hake	24
<i>Mugil cephalus</i>	striped mullet	1
<i>Mustelus californicus</i>	gray smoothhound	27
<i>M. henlei</i>	brown smoothhound	11
<i>Myliobatis californica</i>	bat ray	12
<i>Ophiodon elongatus</i>	lingcod	31
<i>Oxyjulis californica</i>	senorita	169
<i>Paralabrax clathratus</i>	kelp bass	827
<i>P. maculatofasciatus</i>	spotted sand bass	426
<i>P. nebulifer</i>	barred sand bass	1,574
<i>Paralichthys californicus</i>	California halibut	302
<i>Phanerodon atripes</i>	sharpnose surfperch	1
<i>P. furcatus</i>	white surfperch	95
<i>Platyrrhinoidis triseriata</i>	thornback	18

TABLE 1.-contd.

Scientific name	Common name	No. sampled
<i>Pleuronichthys verticalis</i>	hornyhead turbot	1
<i>Porichthys myriaster</i>	specklefin midshipman	2
<i>Prionace glauca</i>	blue shark	19
<i>Rhacochilus toxotes</i>	rubberlip surfperch	26
<i>Rhinobatos productus</i>	shovelnose guitarfish	19
<i>Roccus saxatilis</i>	striped bass	4
<i>Roncador stearnsii</i>	spotfin croaker	12
<i>Sarda chiliensis</i>	Pacific bonito	3,150
<i>Sardinops sagax caeruleus</i>	Pacific sardine	2
<i>Scomber japonicus</i>	Pacific mackerel	5,589
<i>Scarpaena guttata</i>	sculpin	669
<i>Scorpaenichthys marmoratus</i>	cabezon	87
<i>Sebastes atrovirens</i>	kelp rockfish	62
<i>S. auriculatus</i>	brown rockfish	102
<i>S. carnatus</i>	gopher rockfish	51
<i>S. caurinus</i>	copper rockfish	44
<i>S. chlorostictus</i>	greenspotted rockfish	588
<i>S. chrysomelas</i>	black and yellow rockfish	11
<i>S. constellatus</i>	starry rockfish	125
<i>S. dallii</i>	calico rockfish	4
<i>S. diploproa</i>	splitnose rockfish	5
<i>S. elongatus</i>	greenstriped rockfish	192
<i>S. ensifer</i>	swordspine rockfish	16
<i>S. entomelas</i>	widow rockfish	5
<i>S. eos</i>	pink rockfish	7
<i>S. flavidus</i>	yellowtail rockfish	22
<i>S. gilli</i>	bronzespotted rockfish	2
<i>S. goodei</i>	chilipepper	272
<i>S. hopkinsi</i>	squarespot rockfish	66
<i>S. jordani</i>	shortbelly rockfish	1
<i>S. levis</i>	cowcod	24
<i>S. macdonaldi</i>	Mexican rockfish	6
<i>S. miniatus</i>	vermilion rockfish	252
<i>S. mystinus</i>	blue rockfish	184
<i>S. ovalis</i>	speckled rockfish	89
<i>S. paucispinus</i>	bocaccio	1,238
<i>S. pinniger</i>	canary rockfish	4
<i>S. rastrelliger</i>	grass rockfish	32
<i>S. rosaceus</i>	rosy rockfish	47
<i>S. rosenblatti</i>	greenblotched rockfish	50
<i>S. ruberrimus</i>	yelloweye rockfish	1
<i>S. rubrivinctus</i>	flag rockfish	121
<i>S. rufus</i>	bank rockfish	19
<i>S. saxicola</i>	stripetail rockfish	12
<i>S. semicinctus</i>	halfbanded rockfish	3
<i>S. serranoides</i>	olive rockfish	486
<i>S. serriceps</i>	treefish	52
<i>S. umbrosus</i>	honeycomb rockfish	42
<i>S. zacentrus</i>	sharpchin rockfish	1
<i>Semicossyphus pulcher</i>	California sheephead	524
<i>Seriphus politus</i>	queenfish	254
<i>Sphyræna argentea</i>	California barracuda	27
<i>Squalus acanthias</i>	spiny dogfish	90
<i>Stereolepis gigas</i>	giant sea bass	4

TABLE 1.-contd.

Scientific name	Common name	No. sampled
<i>Strongylura exilis</i>	California needlefish	3
<i>Synodus lucioceps</i>	California lizardfish	30
<i>Torpedo californica</i>	Pacific electric ray	1
<i>Trachurus symmetricus</i>	jack mackerel	89
<i>Triakis semifasciata</i>	leopard shark	1
<i>Umbrina roncadore</i>	yellowfin croaker	71
<i>Urolophus halleri</i>	round stingray	1
<i>Zystreureys liolepis</i>	fantail sole	3
-	unidentified fish	31
-	unidentified filleted fish	939
<i>Sebastes</i> spp.	unidentified rockfish fillets	155
Bothidae	unidentified sandab	14
<u>Molluscs and Crustaceans</u>		
<i>Astraea undosa</i>	wavy top	2
<i>Cancer antennarius</i>	rock crab	1
<i>C. anthonyi</i>	yellow crab	6
<i>Haliotis corrugata</i>	pink abalone	3
<i>H. cracherodii</i>	black abalone	2
<i>H. fulgens</i>	green abalone	43
<i>H. rufescens</i>	red abalone	259
<i>H. sorenseni</i>	white abalone	5
<i>Hinnites multirugosus</i>	rock scallop	339
<i>Loxorhynchus grandis</i>	sheep crab	16
<i>Megathura crenulata</i>	giant keyhole limpet	1
<i>Octopus bimaculatus</i>	twospot octopus	1
<i>Panulirus interruptus</i>	California spiny lobster	98
<i>Tivela stultorum</i>	pismo clam	30
-	unidentified mollusc	1
<u>Echinoderms and Coelenterates</u>		
<i>Strongylocentrotus franciscanus</i>	giant red urchin	4
Anthozoa	sea anemone	1

TABLE 2. Most Commonly Landed Species; January through March 1981.

Scientific name	Common name	No. sampled
<u>Fishes</u>		
<i>Scomber japonicus</i>	Pacific mackerel	5,589
<i>Genyonemus lineatus</i>	white croaker	5,214
<i>Sarda chiliensis</i>	Pacific bonito	3,150
<i>Paralabrax nebulifer</i>	barred sand bass	1,574
<i>Sebastes paucispinis</i>	bocaccio	1,238
<i>Paralabrax clathratus</i>	kelp bass	827
<i>Scorpaena guttata</i>	sculpin	669
<i>Citharichthys sordidus</i>	Pacific sanddab	637
<i>Embiotoca jacksoni</i>	black surfperch	597
<i>Sebastes chlorostictus</i>	greenspotted rockfish	588
<i>Semicossyphus pulcher</i>	California sheephead	524
<i>Sebastes serranoides</i>	olive rockfish	486
<i>Medialuna californiensis</i>	halfmoon	429
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	426
<i>Caulolatilus princeps</i>	ocean whitefish	312
<i>Paralichthys californicus</i>	California halibut	302
<i>Sebastes goodei</i>	chilipepper	272
<i>Seriphus politus</i>	queenfish	254
<i>Sebastes miniatus</i>	vermilion rockfish	252
<i>Girella nigricans</i>	opaleye	208
<i>Sebastes elongatus</i>	greenstriped rockfish	192
<i>S. mystinus</i>	blue rockfish	184
<u>Molluscs</u>		
<i>Hinnites multirugosus</i>	rock scallop	339
<i>Haliotis rufescens</i>	red abalone	259

TABLE 3. Catch and Effort Estimates for Anglers; January through March 1981.

	Los Angeles County	Orange County	San Diego County	Total
Angler parties				
weekend	6,036	2,750	3,582	12,368
weekday	2,590	858	1,644	5,092
total	8,626	3,608	5,226	17,460
Angler days				
weekend	16,454	7,306	9,188	32,948
weekday	6,421	1,762	3,655	11,838
total	22,875	9,068	12,843	44,786
Angler-trip-hours				
weekend	101,651	44,556	56,480	202,687
weekday	36,612	10,868	22,331	69,811
total	138,263	55,424	78,811	272,498
Total fishes landed				
weekend	54,379	12,243	22,944	89,566
weekday	30,749	4,348	9,267	44,364
total	85,128	16,591	32,211	133,930
No. rockfishes landed				
weekend	9,097	2,360	5,596	17,053
weekday	4,170	628	2,601	7,399
total	13,267	2,988	8,197	24,452
<i>Anoplopoma fimbria</i> (sablefish)	208	123	4	335
<i>Atractascion nobilis</i> (white seabass)	74	23	76	173
<i>Caulolatilus princeps</i> (ocean whitefish)	620	124	725	1,469
<i>Citharichthys sordidus</i> (Pacific sanddab)	1,752	540	994	3,286
<i>Embiotoca jacksoni</i> (black surfperch)	1,995	222	74	2,291
<i>Genyonemus lineatus</i> (white croaker)	19,683	3,766	3,494	26,943
<i>Girella nigricans</i> (opaleye)	652	95	35	782
<i>Medialuna californiensis</i> (halfmoon)	1,289	495	67	1,851
<i>Oncorhynchus tshawytscha</i> (king salmon)	0	0	0	0

TABLE 3.-contd.

	Los Angeles County	Orange County	San Diego County	Total
<i>Ophiodon elongatus</i> (lingcod)	11	14	52	77
<i>Paralabrax clathratus</i> (kelp bass)	1,733	808	1,299	3,840
<i>P. maculatofasciatus</i> (spotted sand bass)	12	376	1,913	2,301
<i>P. nebulifer</i> (barred sand bass)	2,822	1,235	4,175	8,232
<i>Paralichthys californicus</i> (California halibut)	1,133	92	313	1,538
<i>Sarda chiliensis</i> (Pacific bonito)	12,558	440	326	13,324
<i>Scomber japonicus</i> (Pacific mackerel)	19,399	2,564	6,568	28,531
<i>Scorpaena guttata</i> (sculpin)	2,288	217	771	3,276
<i>Sebastes atrovirens</i> (kelp rockfish)	37	0	306	343
<i>S. auriculatus</i> (brown rockfish)	189	24	175	388
<i>S. caurinus</i> (copper rockfish)	132	29	102	263
<i>S. chlorostictus</i> (greenspotted rockfish)	1,520	292	1,109	2,921
<i>S. goodei</i> (chilipepper)	379	374	359	1,112
<i>S. miniatus</i> (vermilion rockfish)	344	112	826	1,282
<i>S. mystinus</i> (blue rockfish)	1,080	60	195	1,335
<i>S. paucispinus</i> (bocaccio)	3,475	604	1,054	5,133
<i>S. rastrelliger</i> (grass rockfish)	110	41	35	186
<i>S. serranoides</i> (olive rockfish)	1,332	211	763	2,306
<i>Semicossyphus pulcher</i> (California sheephead)	508	328	597	1,433
<i>Sphyræna argentea</i> (California barracuda)	37	25	49	111
<i>Trachurus symmetricus</i> (jack mackerel)	321	9	19	349

TABLE 4. Standard Error of the Estimates for Anglers; January through March 1981.

	Los Angeles County	Orange County	San Diego County	Total
Angler parties	918	220	590	1,113
Angler days	2,387	556	1,424	2,835
Angler-trip-hours	15,401	3,481	9,423	18,387
Total fishes landed	7,574	1,654	4,740	9,087
No. rockfishes landed	2,015	509	2,057	2,924
barred sand bass	580	173	851	1,045
black surfperch	517	86	33	525
blue rockfish	616	37	52	619
bocaccio	552	125	254	620
brown rockfish	43	8	52	68
California barracuda	21	19	23	37
California halibut	316	19	78	326
California sheephead	159	53	182	247
chilipepper	150	93	143	227
copper rockfish	47	12	68	83
grass rockfish	60	17	24	67
greenspotted rockfish	356	70	400	540
halfmoon	342	172	32	384
jack mackerel	84	5	7	85
kelp bass	383	185	248	492
kelp rockfish	28	0	146	148
king salmon	0	0	0	0
lingcod	7	7	10	14
ocean whitefish	205	41	248	324
olive rockfish	375	58	204	431
opaleye	190	40	19	195
Pacific bonito	1,587	147	113	1,598
Pacific mackerel	2,854	431	1,480	3,243
Pacific sanddab	982	139	376	1,061
sablefish	58	52	3	78
sculpin	559	39	184	589
spotted sand bass	7	152	407	435
vermillion rockfish	84	43	343	356
white croaker	3,612	753	655	3,748
white seabass	29	9	29	42

TABLE 5. Catch and Effort Estimates for Divers; January through March 1981.

	Los Angeles County	Orange County	San Diego County	Total
Diver parties				
weekend	157	142	290	589
weekday	<u>81</u>	<u>0</u>	<u>74</u>	<u>155</u>
total	238	142	364	744
Diver days				
weekend	386	352	711	1,449
weekday	<u>190</u>	<u>0</u>	<u>223</u>	<u>413</u>
total	576	352	934	1,862
Diver-hours				
weekend	514	435	652	1,601
weekday	<u>180</u>	<u>0</u>	<u>242</u>	<u>422</u>
total	694	435	894	2,023
No. organisms landed				
weekend	968	1,086	1,675	3,729
weekday	<u>335</u>	<u>0</u>	<u>1,026</u>	<u>1,361</u>
total	1,303	1,086	2,701	5,090
<i>Haliotis corrugata</i> (pink abalone)				
	0	0	11	11
<i>H. cracherodii</i> (black abalone)				
	4	0	0	4
<i>H. fulgens</i> (green abalone)				
	8	75	48	131
<i>H. rufescens</i> (red abalone)				
	0	0	1,576	1,576
<i>Hinnites multirugosus</i> (rock scallop)				
	281	681	41	1,003
<i>Panulirus interruptus</i> (California spiny lobster)				
	501	21	94	616
<i>Paralabrax clathratus</i> (kelp bass)				
	88	13	94	195
<i>Semicossyphus pulcher</i> (California sheephead)				
	164	160	368	692

TABLE 6. Standard Error of the Estimates for Divers; January through March 1981.

	Los Angeles County	San Diego County	Orange County	Total
Diver parties	47	20	56	75
Diver days	112	51	145	190
Diver-hours	146	83	178	245
No. organisms landed	325	187	704	798
black abalone	3	0	0	3
California sheephead	71	45	129	154
California spiny lobster	273	7	37	276
green abalone	7	56	23	61
kelp bass	32	7	32	46
pink abalone	0	0	7	7
red abalone	0	0	473	473
rock scallop	68	202	26	215

TABLE 7. Ten Most Commonly Landed Species in Each County; January through March 1981.

County	Rank	Scientific name	Common name
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>Sebastes paucispinis</i>	bocaccio
	5.	<i>Paralabrax nebulifer</i>	barred sand bass
	6.	<i>Scorpaena guttata</i>	sculpin
	7.	<i>Embiotoca jacksoni</i>	black surfperch
	8.	<i>Paralabrax clathratus</i>	kelp bass
	9.	<i>Sebastes chlorostictus</i>	greenspotted rockfish
	10.	<i>S. serranoides</i>	olive rockfish
Orange	1.	<i>Genyonemus lineatus</i>	white croaker
	2.	<i>Scomber japonicus</i>	Pacific mackerel
	3.	<i>Paralabrax nebulifer</i>	barred sand bass
	4.	<i>P. clathratus</i>	kelp bass
	5.	<i>Hinnites multirugosus</i>	rock scallop
	6.	<i>Sebastes paucispinis</i>	bocaccio
	7.	<i>Citharichthys sordidus</i>	Pacific sanddab
	8.	<i>Medialuna californiensis</i>	halfmoon
	9.	<i>Semicossyphus pulcher</i>	California sheephead
	10.	<i>Sarda chiliensis</i>	Pacific bonito
San Diego	1.	<i>Scomber japonicus</i>	Pacific mackerel
	2.	<i>Paralabrax nebulifer</i>	barred sand bass
	3.	<i>Genyonemus lineatus</i>	white croaker
	4.	<i>Paralabrax maculatofasciatus</i>	spotted sand bass
	5.	<i>Haliotis rufescens</i>	red abalone
	6.	<i>Paralabrax clathratus</i>	kelp bass
	7.	<i>Sebastes chlorostictus</i>	greenspotted rockfish
	8.	<i>S. paucispinis</i>	bocaccio
	9.	<i>Citharichthys sordidus</i>	Pacific sanddab
	10.	<i>Semicossyphus pulcher</i>	California sheephead

TABLE 8. Occurrence of Sublegal-size Fishes in Examined Catches; January through March 1981.

Scientific name	Common name	No. examined	% legal
<u>Fishes</u>			
<i>Atractoscion nobilis</i>	white seabass	18	22
<i>Paralabrax clathratus</i>	kelp bass	601	84
<i>P. nebulifer</i>	barred sand bass	1,246	88
<i>P. maculatofasciatus</i>	spotted sand bass	369	86
<i>Paralichthys californicus</i>	California halibut	245	60
<i>Sphyraena argentea</i>	California barracuda	24	8
<u>Molluscs and Crustaceans</u>			
<i>Haliotis rufescens</i>	red abalone	143	96
<i>Panulirus interruptus</i>	California spiny lobster	67	79

KELP BASS

601 measured

84% legal

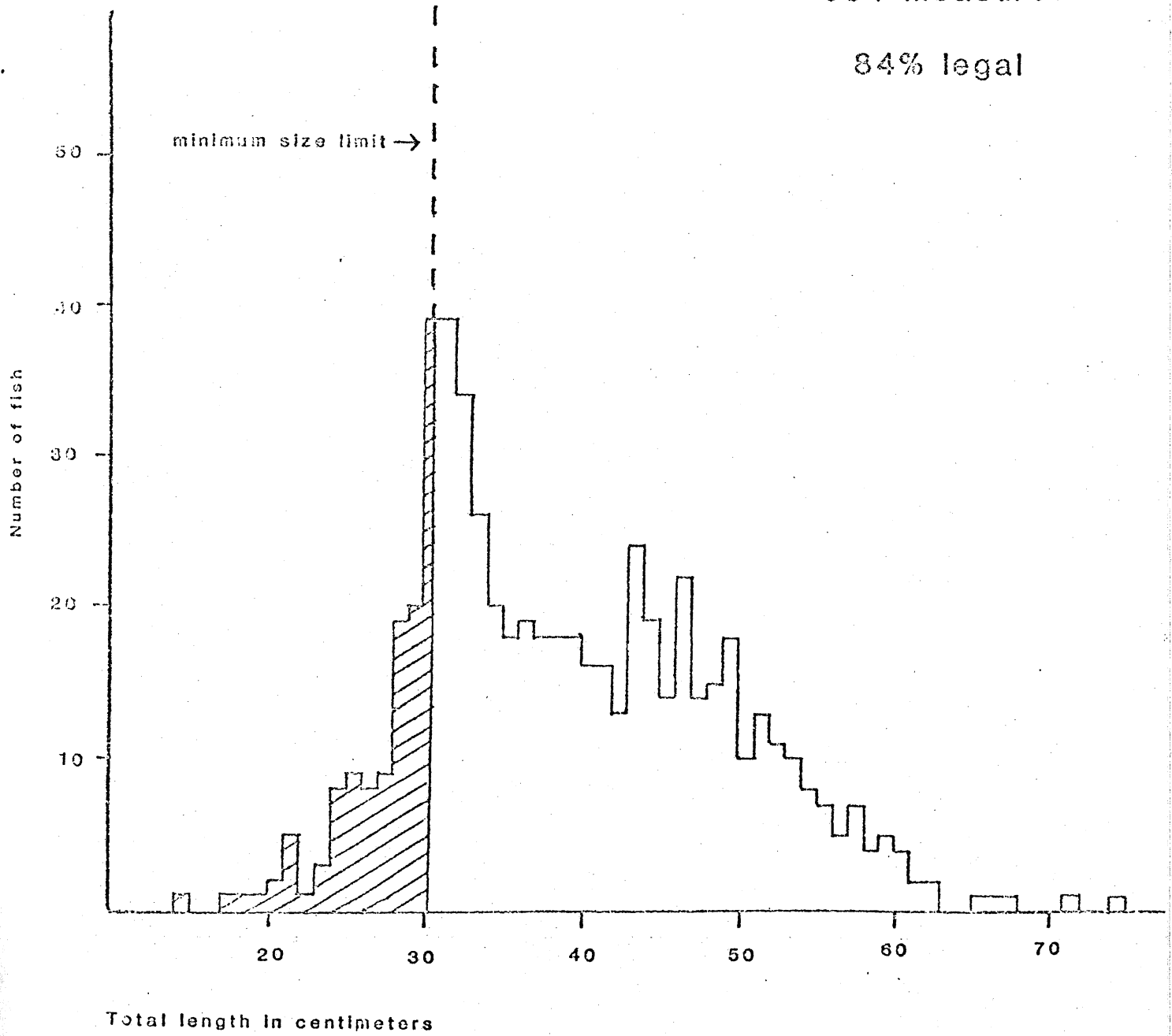


FIGURE 1. Length frequency of kelp bass

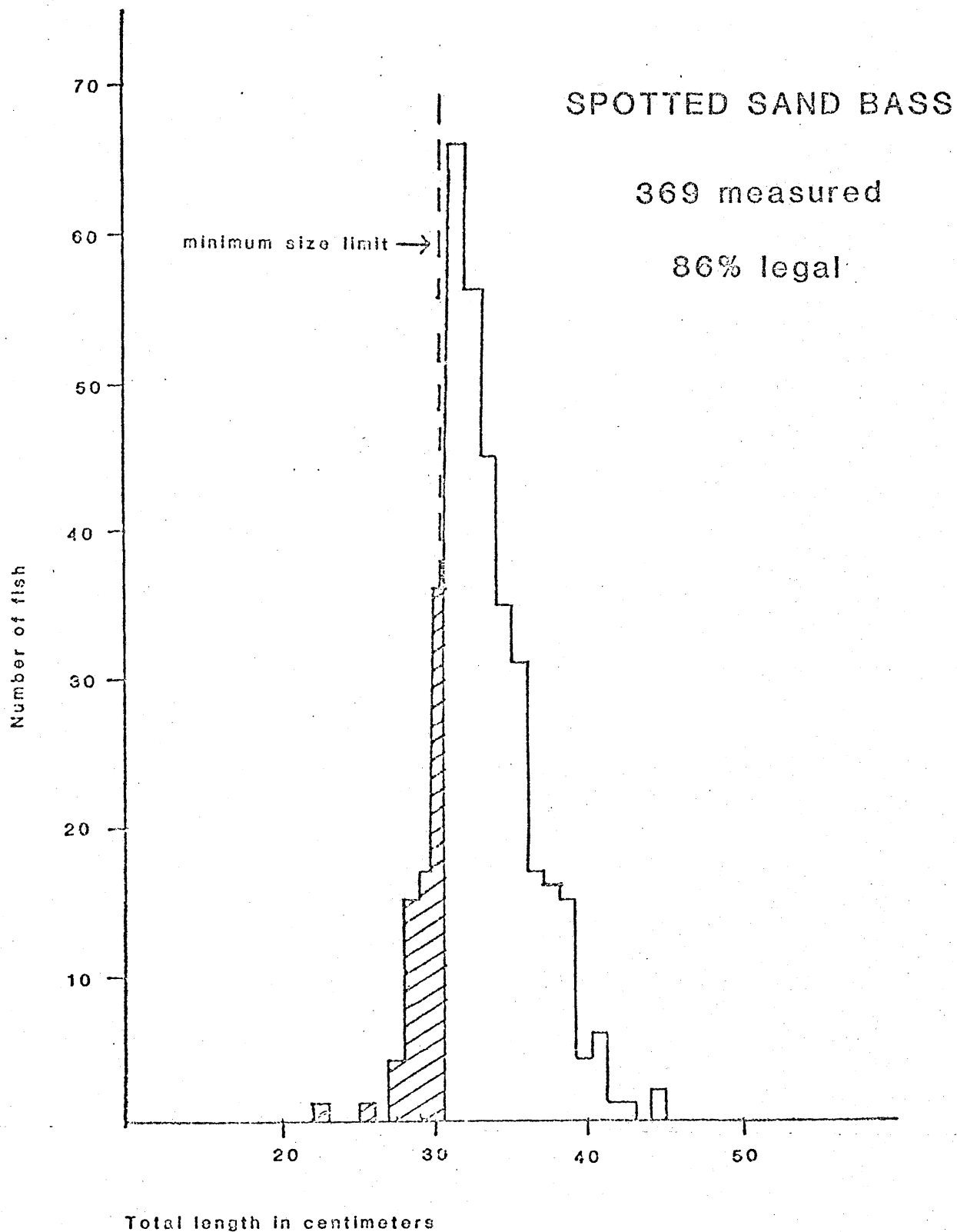


FIGURE 2. Length frequency of spotted sand bass

BARRED SAND BASS

1,246 measured

88% legal

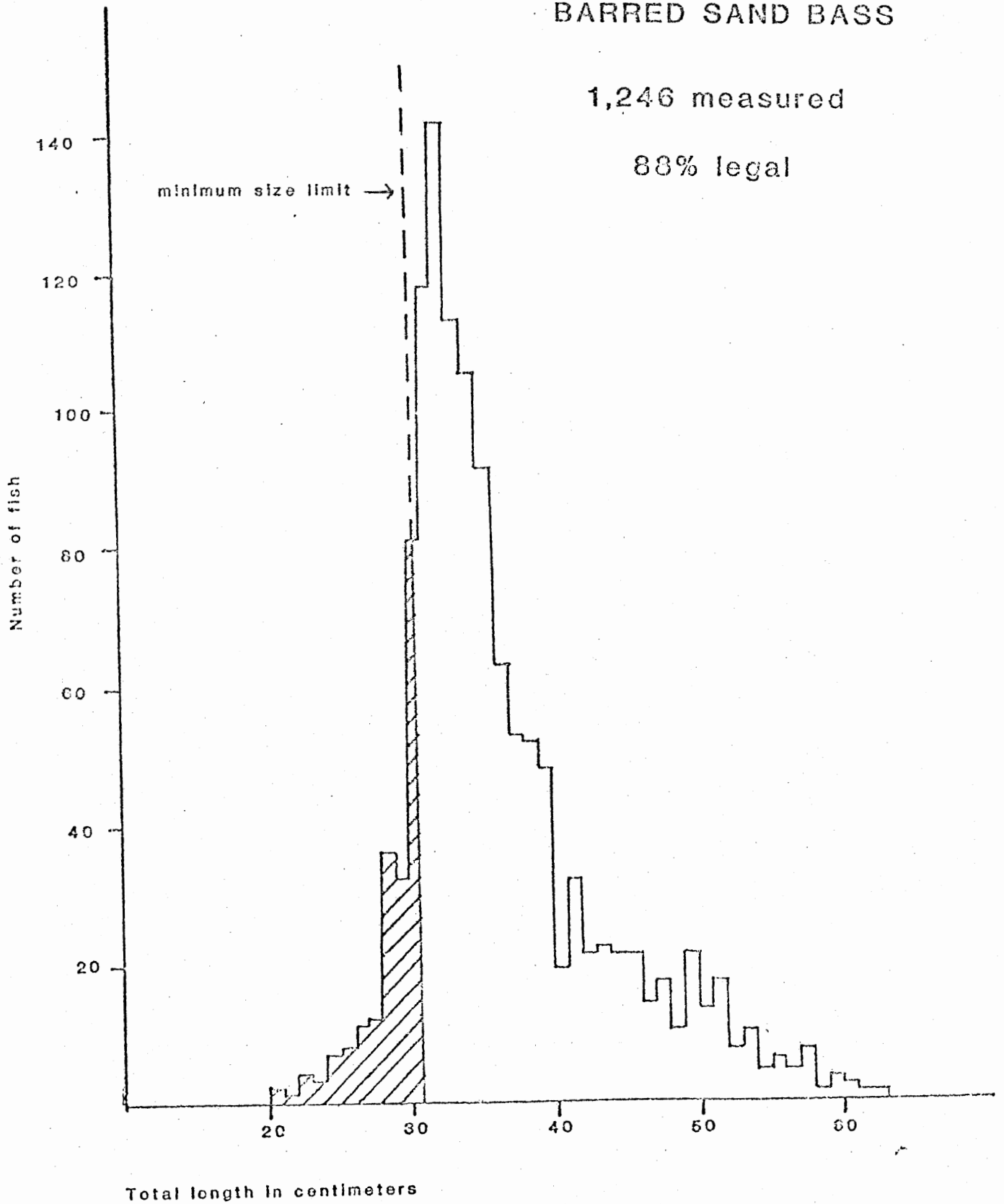


FIGURE 3. Length frequency of barred sand bass

CALIFORNIA HALIBUT

245 measured

60% legal

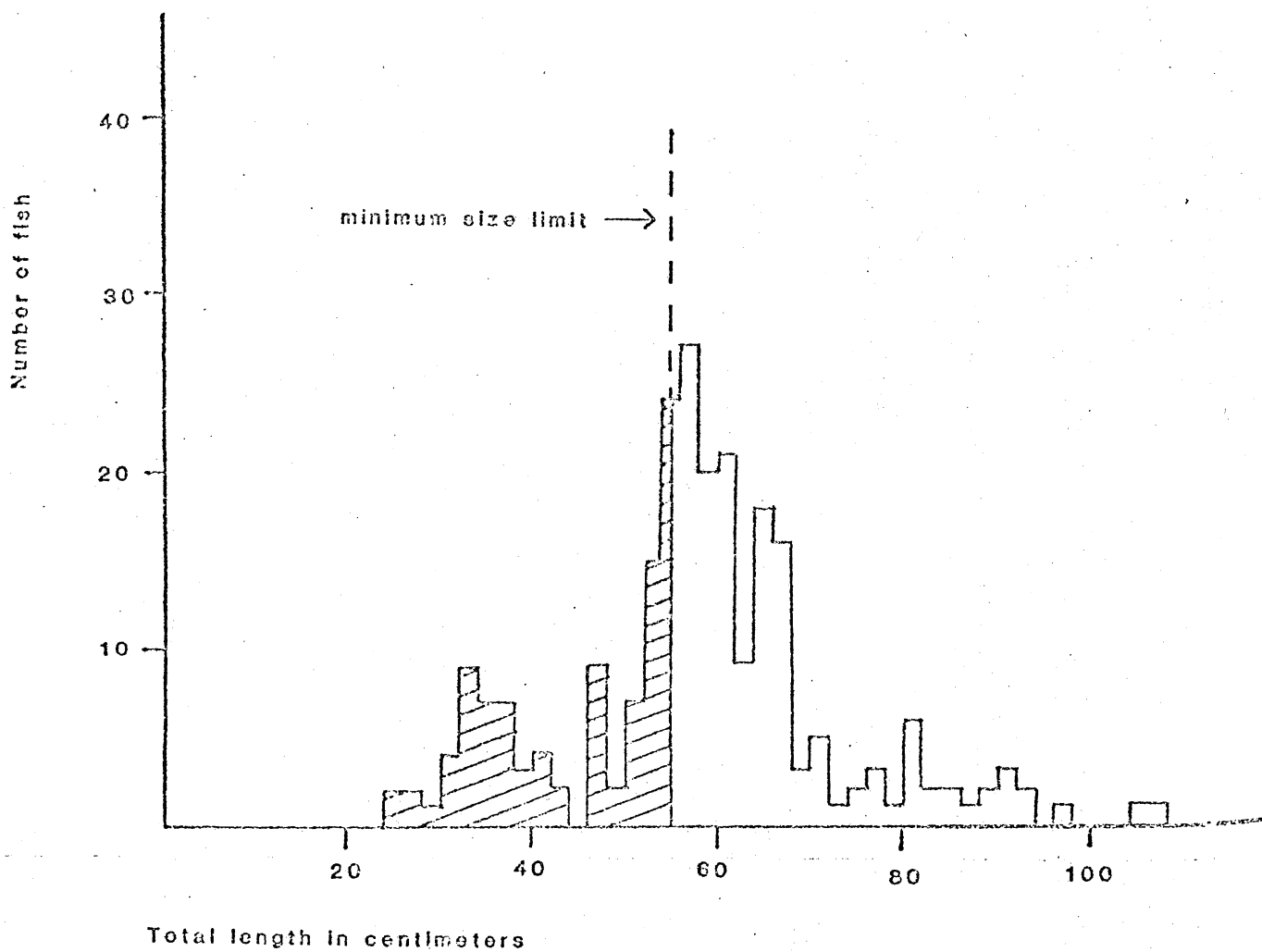


FIGURE 4. Length frequency of California halibut

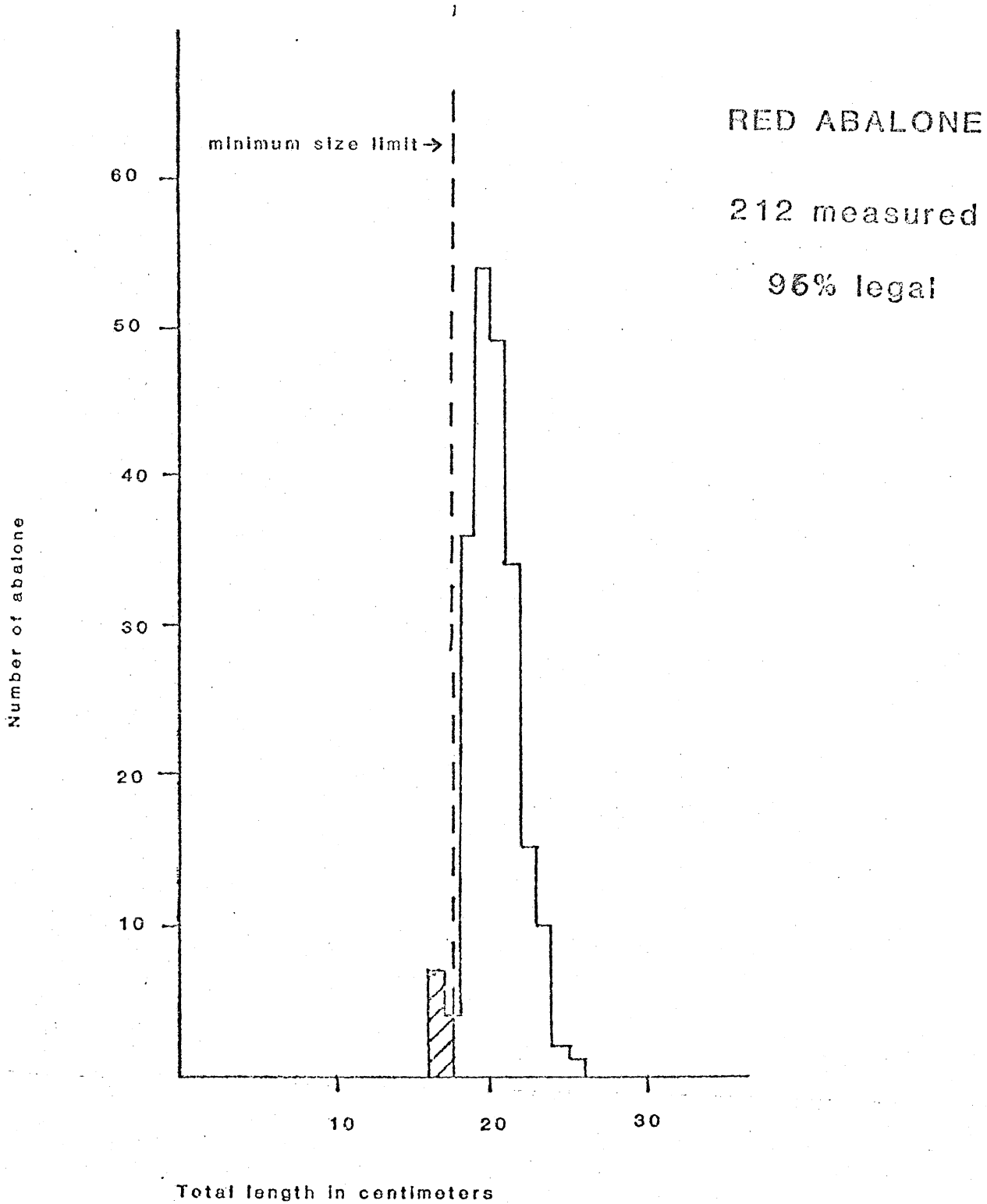


FIGURE 5. Length frequency of red abalone