

# **Preliminary Report Cruise No. II - Surveys of the Fish Resources on the Pacific Shelf between Southern Mexico and Colombia - Part 2: Nicaragua - Honduras - El Salvador, 20 May to 2 June 1987**

CRUISE REPORTS "DR FRIDTJOF NANSEN"

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IMR, Bergen

The research programme SURVEYS OF THE FISH RESOURCES ON THE PACIFIC SHELF BETWEEN SOUTHERN MEXICO AND COLOMBIA is Sponsored by The Norwegian Agency for Development Assistance NORAD, The Food and Agriculture Organization of the United Nations FAO, and the United Nations Development Programme UNDP. The programme is being planned through the OLDEPESCA/FAO Working Group on Fisheries Research in the Region of Central America and Panama. Its execution is the responsibility of the Institute of Marine Research, Bergen in cooperation with FAO and national fisheries administrations.

The programme will comprise four coverages of the region. This preliminary cruise report describes the work and some of the findings of the second. Pull reports will be issued after the completion of the programme.

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# 1. Introduction

Tasks. The agreed work tasks was a follow-up of the previous survey conducted from 20 February to 3 March, and included the following: To conduct an acoustic fishing survey for small pelagic fish on the shelf; to conduct bottom trawling experiments for demersal fish, deep water shrimp and langostinos; and to test the availability of squid off the shelf with light and jigging. The hydrographic profiles run during the previous survey were to be repeated, and one new section to be set out in Nicaragua.

Survey plan. The time available for the work between San Juan in Nicaragua and Acajutla in El Salvador allowed a mean rate of coverage of 10 to 15 nm between course tracks, leaving some 10 hours a day for fishing. The acoustic survey was to be supplemented with a demersal trawling programme with test of catch rates in good concentrations. In the area of the slope a detailed trawling programme of prelocated hauls were set out to check the high abundance of langostino and deep sea shrimps found during the previous cruise. A testing programme on the availability of oceanic squid using light and jigs was to be performed.

Scientific staff: The following participated from the region:

Nicaragua: Manuel Perez, Rodolfo Sanchez

Honduras: Luis Morales

El Salvador: Orlando Villatoro, Juan Ulloa

From FAO: Luis Villegas.

The vessels own scientific staff was: Tore Strømme (until 27.May), Johannes Hamre (from 20.May), Helge Ullebust, Øivind Torgersen, Martin Dahl.

## 2. Narrative

The vessels itinerary was as follows:

Departure San Juan 20 May  
Called at Corinto 27 May  
Arrival Acajutla 2 June

During 6 days of work in Nicaraguan waters the vessel steamed abt. 1100 nm and 46 trawl stations were made. One day was spent working in the shallow Golfo de Fonseca. During 5 days of work in El Salvador waters the distance steamed was abt. 700 nm and 33 fishing stations were made.

The course tracks and the fishing stations for the whole area is shown in Figure 1. The previous survey indicated that the areas of greatest interest would be the inshore region and the part near the edge of the shelf and the slope itself down to abt 300 m of depth. The survey effort was accordingly concentrated in these zone with a more sparse coverage of the middle of the shelf. The shallow depth of the Golfo de Fonseca limited the coverage to the central parts.

The weather condition were favourable, and did not put any limitation upon the work. The prevailing wind was southeasterly force 1-3.

### 3. Hydrography

Figure 2 shows the surface temperature over the shelf, while Figure 3 a, b, shows the three sections worked out. Apart from a slight increase in the surface temperature, the hydrographic situation is similar to that observed during the previous survey.

Off San Juan del Sur there is a decrease in temperature towards the shore, indicating a limited upwelling of intermediate water in the bay south of San Juan. There is a transition layer between about 30 and 50 m of depth with a temperature drop of abt. 6°C and a drop in oxygen content to about 1 ml/l, at 100 m depth. The parts of the shelf deeper than abt. 100 m is thus covered by cool oxygen deficient bottom water.

The sea surface temperature off El Salvador (Figure 2) shows a slightly increasing trend towards the shore and northwards. The hydrographic profile off Acajutla is shown in Figure 3b. The transition layer has a temperature drop of abt 10°C and is located between 50 and 100 m of depth. At 100 m depth the oxygen content has dropped to 1 ml/l.

## 4. Fish distribution

Figure 4 illustrates the distribution of all fish as observed with the acoustic integration system. The unit of fish abundance is 0.1 m<sup>2</sup> per nm<sup>2</sup> acoustic reflection. Fish that occurs from 10 m below surface level down to about 0.5 m from the bottom will be observed with this system. The distribution chart shows three categories of fish concentration: 1-9 units = scattered fish; 10-49 units = slightly gathered fish; > 50 units = concentrated fish.

### Nicaragua.

The fish distribution on the shelf as observed by the acoustic system consists of an inshore community found along the coast out to a depth of about 75 m. This community contains small pelagics, mainly anchovies and clupeids, and various bottom fish, predominantly gerrids and lutjanids (snappers). Good concentrations were found in two small areas in the central and southern part of the region.

High concentrations of mesopelagics were recorded over most of the slope and further off during the survey (not included in the fish distribution chart). Practically no other fish concentration could be identified from the echo traces in the offshore waters.

### Golfo de Fonseca.

As in previous survey fish was found all over the shallow gulf that could be surveyed by the vessel, but in low concentrations only. The main part of the fish observed was anchovies, clupeids and various bottom fish, predominantly croakers and catfishes.

### El Salvador.

The distribution pattern of the pelagics, recorded by the echosounder is similar to that observed off Nicaragua. Fairly good concentrations were found in two small areas in the central and northern part of the region. These consisted of anchovies and clupeids mainly. Barracudas and sharks may also have contributed to these recordings.

## 5. Results of fishing experiments

The bottom trawl used is a shrimp-cum-fish trawl (see Annex 1) and it may not be as efficient for shrimp as specially designed shrimp-trawls.

### Nicaragua.

The records of all the fishing stations made during this part of the cruise are shown in Annex 2, those numbered from 338 through 383 refer to the area off Nicaragua, including Golfo de Fonseca (cfr. Figure 1). Most of the trawl stations represent prelocated hauls for faunistic studies and swept area estimates. The catch composition and catch rates can conveniently be described in an inshore and an offshore community referring to depths above and below abt 75 metres. The inshore catch rates are relatively low, but the catches consist of a large variety of species. The fish catches made, standardized to rates per hour towed (in kilos) and grouped as pelagics (clupeids, anchovies, bumpers), bottom fish and shrimps plus lobsters are shown in Table 1. The dominating pelagic species are anchovies and fish from the family Gerreidae dominate the bottom fish. The lobsters (*Panulirus gracilis*) was caught in the area southeast of P. Corinto only. The mean catch rate inshore (15 st.) including all species is 505 kg/h. Less then 3% of the catch is shrimps.

**Table 1. Fish catches, inshore community, Nicaragua. Catch rates in Kg. per hour towed.**

St. no.	Depth m	Pelagic fish	Bottom fish	Shrimps Lobster	Total
340	49	1045	409		1454
341	31	118	467	13	598
342	18	55	501	14	570
353	70	42	605	2	648
354	21	63	103	7	173
355	35	53	236	18	307
356	75	186	244	17	447
357	75	26	217	21	264
358	34	34	122	16	172
361	53	73	372	12	457
362	23	60	257	7	323
363	28	32	483	8	523
364	29	231	575	19	825
365	54	129	278		407
370	59	144	245	16	405

Fishing offshore was primarily arranged to cover different depths between 150 and 350 m in testing for langostino and shrimp, but a number of hauls were also made on the shelf itself between 75 and 150 metres. The mean catch rate offshore (21 st.) is 3.4 tons/hour and the main groups of species are shown in Table 2. The dominating fish species are silver smelt (Family Argentinidae), cutlass fish (Family Trichiuridae) and butter fish (Family Stromateidae). Good catches of langostino (*Pleuroncodes planipes*) and deep sea shrimp (*Heterocarpus vicarius*) were also made over a substantial area. These results show that there must be a considerable biomass of these stocks along the edge of the slope, between 100 and 400 metres depth.

**Table 2. Fish catches, offshore community, Nicaragua region. Standardized to rates of catch per hour's tow, tons.**

Station no.	Depth m	Fishes	Langostino	Shrimps	Total
338	159	1.5			1.5
339	90	0.7			0.7
343	149	6.0			6.0
344	271	0.9	4.8	6.3	12.0
345	372	0.8			0.8
346	397				0.0

347	305			0.1	0.1
348	187	0.6			0.6
349	357	0.1			0.1
350	282	0.2	7.1		7.3
352	120	9.0	4.8	0.2	14.0
360	147	1.2	0.6		1.8
366	79	0.3			0.3
367	246	0.1	1.1	0.3	1.5
368	147	1.6	1.4		1.9
378	98	2.4	1.2		3.6
379	101	2.5			2.5
380	107	2.3	5.0	0.7	8.0
381	177	1.7	2.9		4.6
382	252	0.1	5.4	2.2	7.7
383	353				0.0

Golfo De Fonseca.

In the Golfo De Fonseca 5 prelocated trawl stations were made and catch rates in kg/h by stations and groups are shown in Table 3. The mean catch rate including all species is 236 kg/h. Abt. 9% of the catch is shrimps. The pelagics are dominated by clupeids (60%), the bottom fish by croaker (Family Sciaenidae), butter fish and catfish (Family Ariidae).

**Table 3. Fish catches in Golfo De Fonseca. Catch rates in kilos per hour towed.**

St. no.	Depth m	Pelagic fish	Bottom fish	Shrimps	Total
372	26	46	155	21	222
373	14	11	72	40	123
374	16	74	82		156
375	30	12	448		460
377	51	12	168	43	223

El Salvador.

The fishing stations worked on the shelf off El Salvador are recorded in Annex 3, stations 384 through 417. Catch rates of arbitrarily located hauls inshore (less than 75 m depth) range from abt 70 to abt. 1900 kgs per hour's tow, with mean catch of 440 kgs/h. The anchovies dominate the pelagics (62%), whereas the barracuda (Family Sphyraenidae) and the butterfish are most numerous among the stocks grouped as bottom fish. Commercial bottom fish such as snappers (Family Lutjanidae) were scarce. Sharks occurred in numbers in some of the hauls.

**Table 4. Fish catches, inshore community, El Salvador. Catch rates in Kg per hour towed.**

St. no.	Depth m	Pelagic fish	Bottom fish	Shrimps	Total
376	20	62	116	42	220
387	60	202	150	2	354
388	32	88	125	18	231
389	49	73	177	15	265
390	71	31	300	22	353
394	65	18	51	0	69
395	26	176	295	27	498
397	35	36	92	32	160
401	62	314	181	1	496
403	30	127	165	16	308
404	38	39	171	15	225
409	70	845	68	3	916
410	31	76	151	9	236



411	60	48	786	0	834
415	62	148	178		326
416	25	734	1019	163	1961

The mean catch rate offshore (17st.) is 2.2 tons/hour and the catch rate by main groups of species are shown in Table 5. The dominant fish species are silver smelt (st. 392), threadfin bass and butterfish. Good catches of langostino were made over a substantial area located at the edge of the shelf between 200 and 400 m depth. At st. 391, also a good catch of deep sea shrimp was made.

**Table 5. Catch rates by fish group, langostino and shrimps offshore El Salvador. Catch rates in tons per hour towed.**

Station no.	Depth m	Fishes	Langostino	Shrimps	Total
384	295	0.1	0.2		0.3
385	190	1.1	0.2	0.1	1.4
386	95	0.4			0.4
391	248	0.6	14.8	0.6	16.0
392	291	2.3	0.1		2.4
393	94	0.2			0.2
398	144	0.3	0.1		0.4
399	254	0.1	7.9	0.1	8.1
400	97	0.4			0.4
405	367				0.0
406	267	0.3	0.3		0.6
407	160	0.1	0.4		1.1
408	104	0.2			0.2
412	251	0.1	1.3		1.4
413	205	0.1	2.0		2.3
414	122	0.2	0.1		0.3

## 6. Catch of oceanic squid

Some effort was spend in testing the availability of oceanic squids (Dosidiscus gigas) by light and jigging. The catch rate in numbers per 30 min. jigging (2 handjigs) by station is shown in Fig. 5. 35 stations were jigged and 117 specimens caught. The record catch is 39 specimens and obtained in the central part of the region.

## 7. Fish biology

Pooled size compositions of main species caught are shown in Annex 4. Annex 5. gives a list of all species caught.

FIGURE 1. COURSE TRACKS AND FISHING STATIONS - FIGURA 1. RED DE RUMBOS Y ESTACIONES DE PESCA

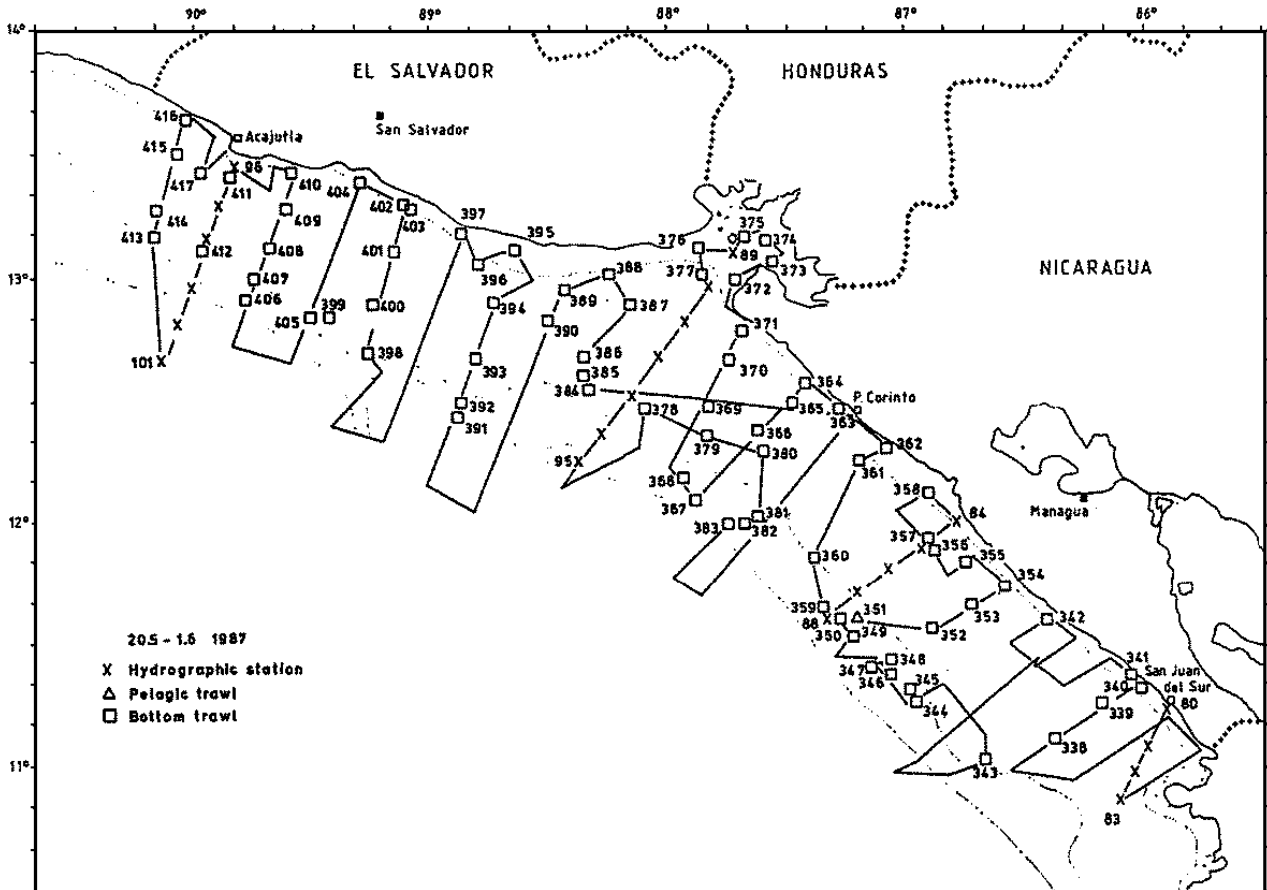


FIGURE 2. SEA SURFACE TEMPERATURES - FIGURA 2. TEMPERATURAS SUPERFICIALES DEL MAR

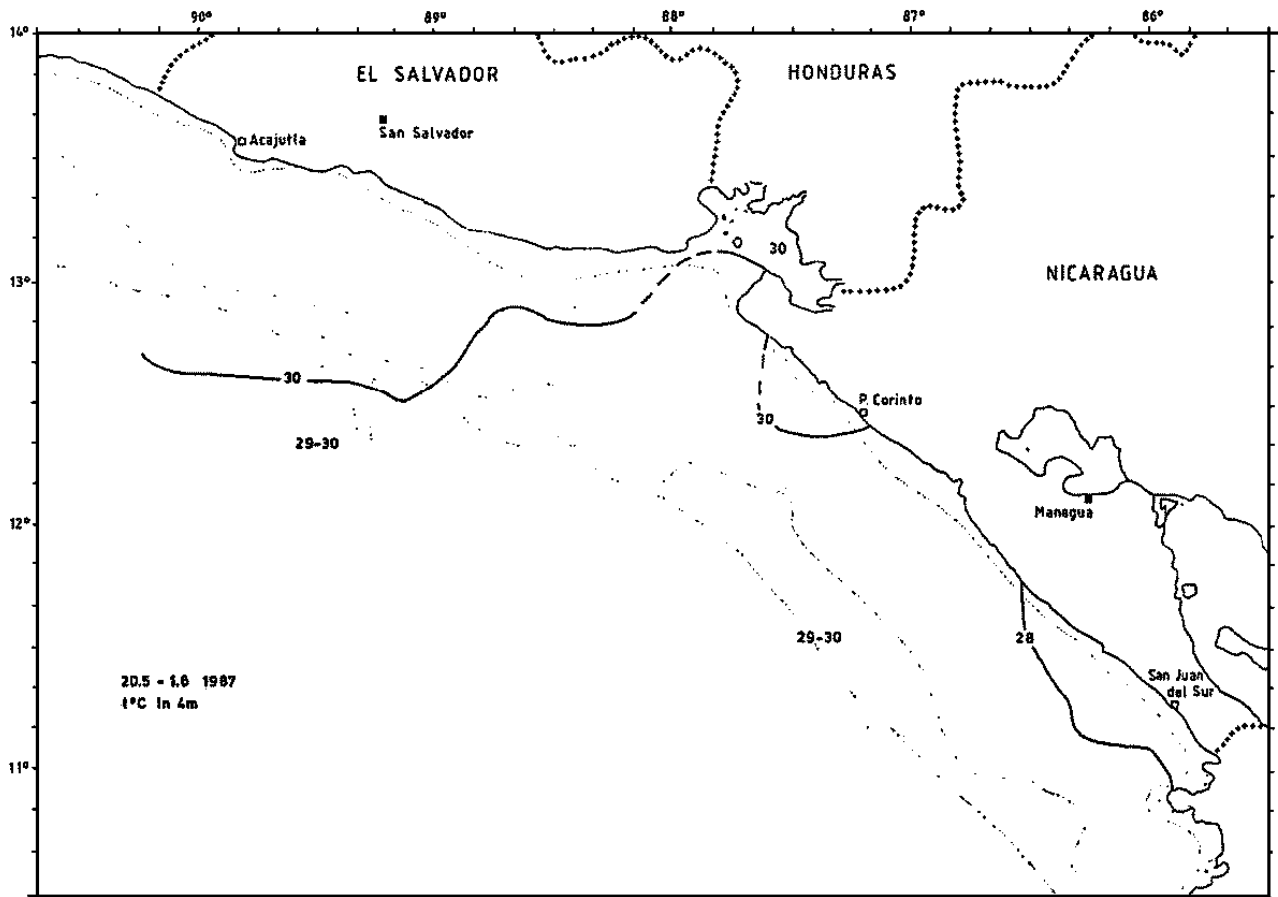
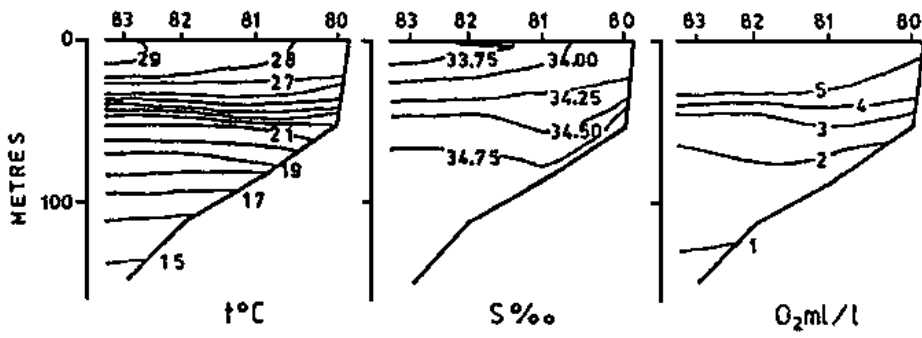
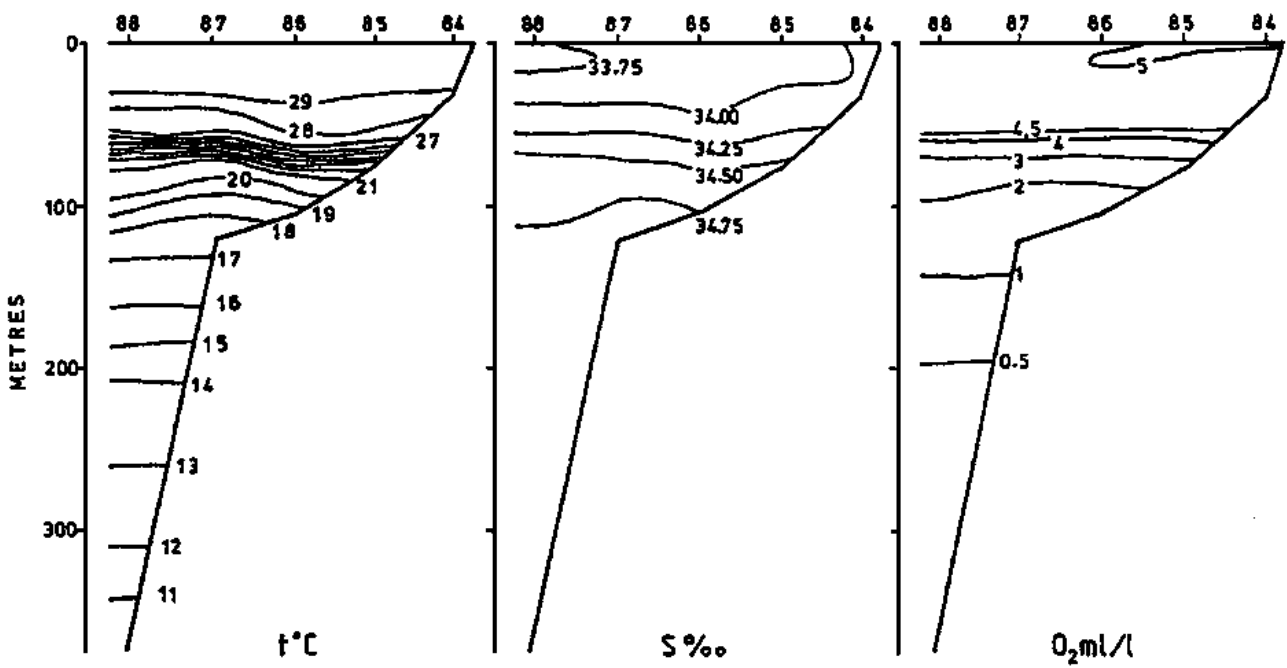


FIGURE 3a. HYDROGRAPHIC PROFILES - FIGURA 3a. PERFILES HIDROGRAFICOS

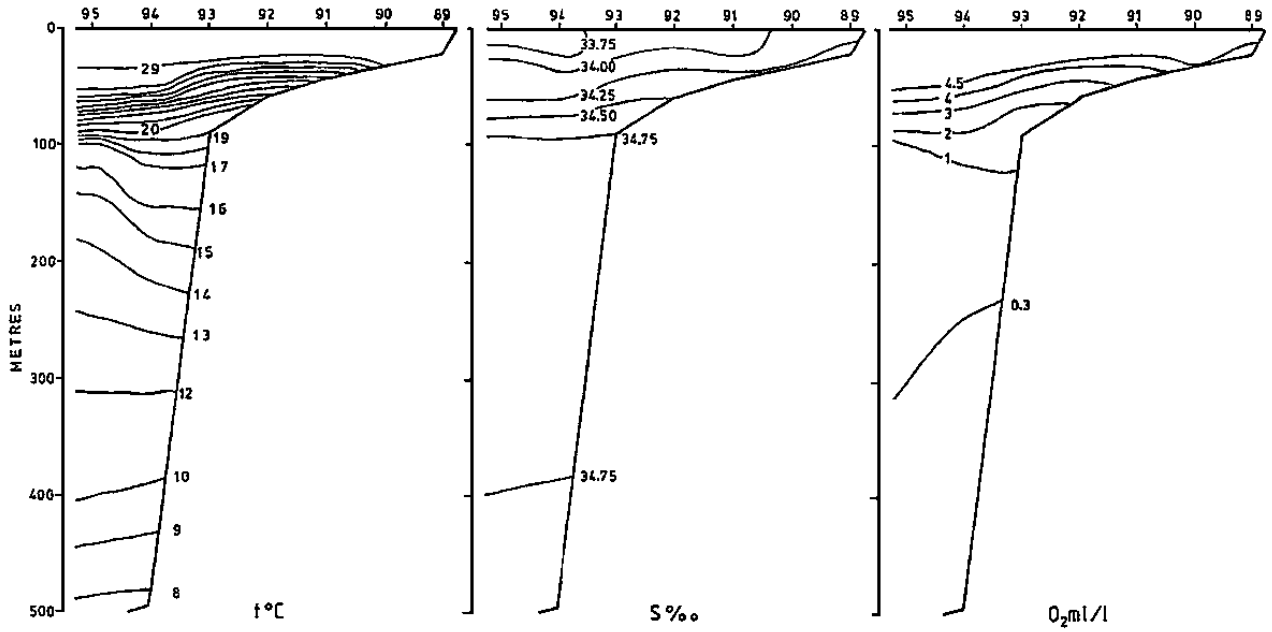


SAN JUAN DEL SUR 20.5 1987

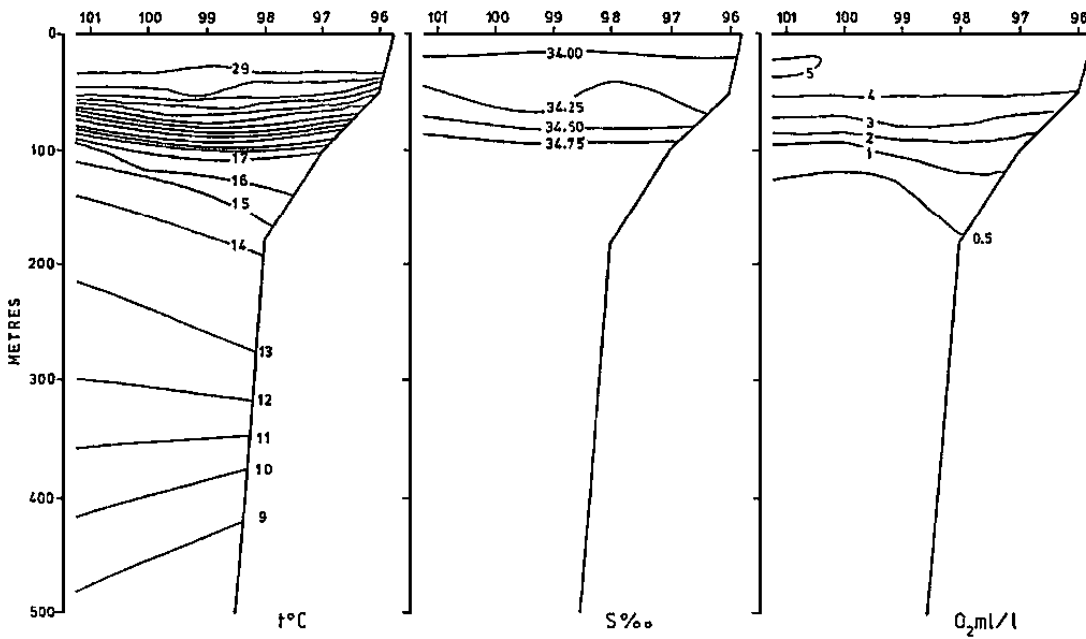


PTD. SANDINO 23 -24.5 1986

FIGURE 3b. HYDROGRAPHIC PROFILES - FIGURA 3b. PERFILES HIDROGRAFICOS



GULF OF FONSECA 25 -26.5 1987



ACAJUTLA 31.5 - 1.6 1987

FIGURE 4. FISH DISTRIBUTION - FIGURA 4. DISTRIBUCION DE LOS PECES

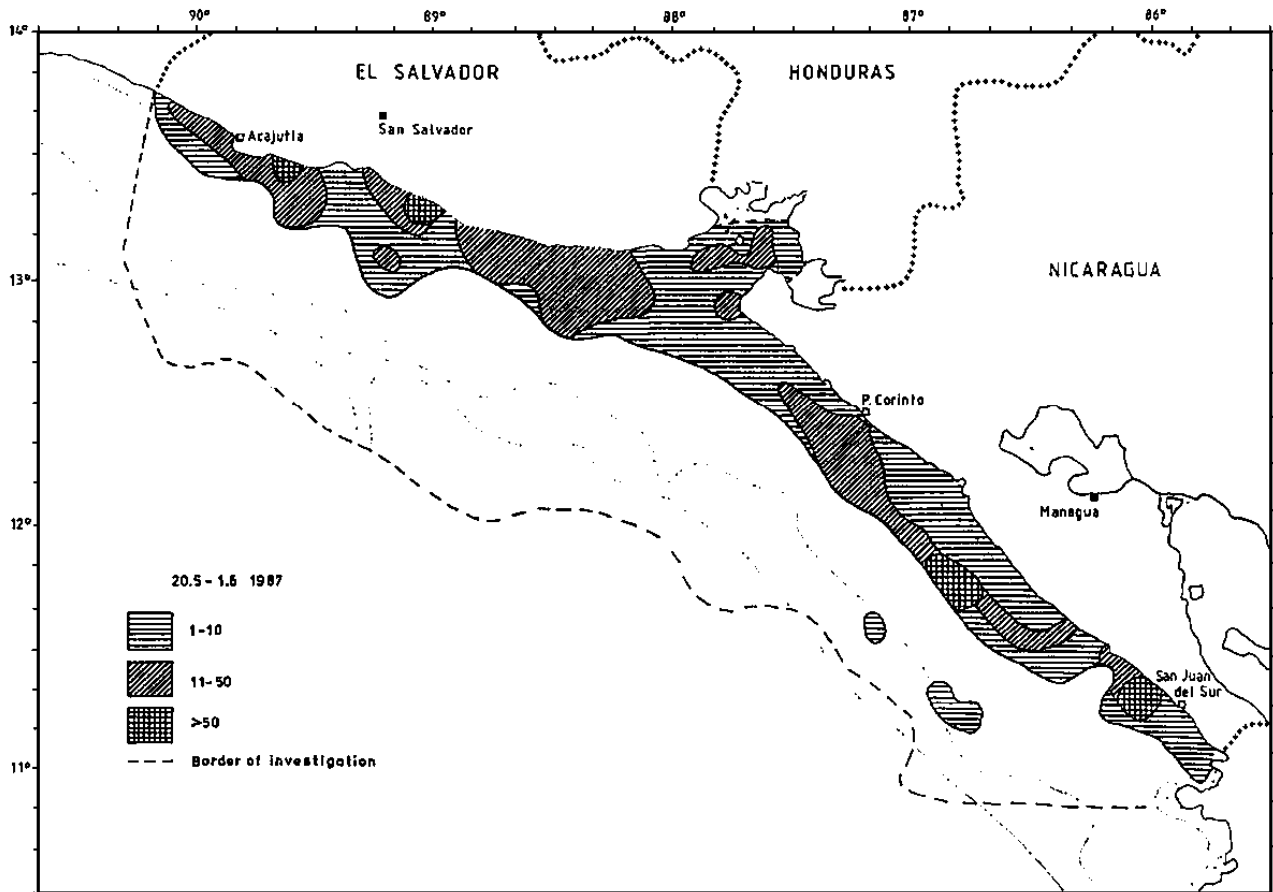
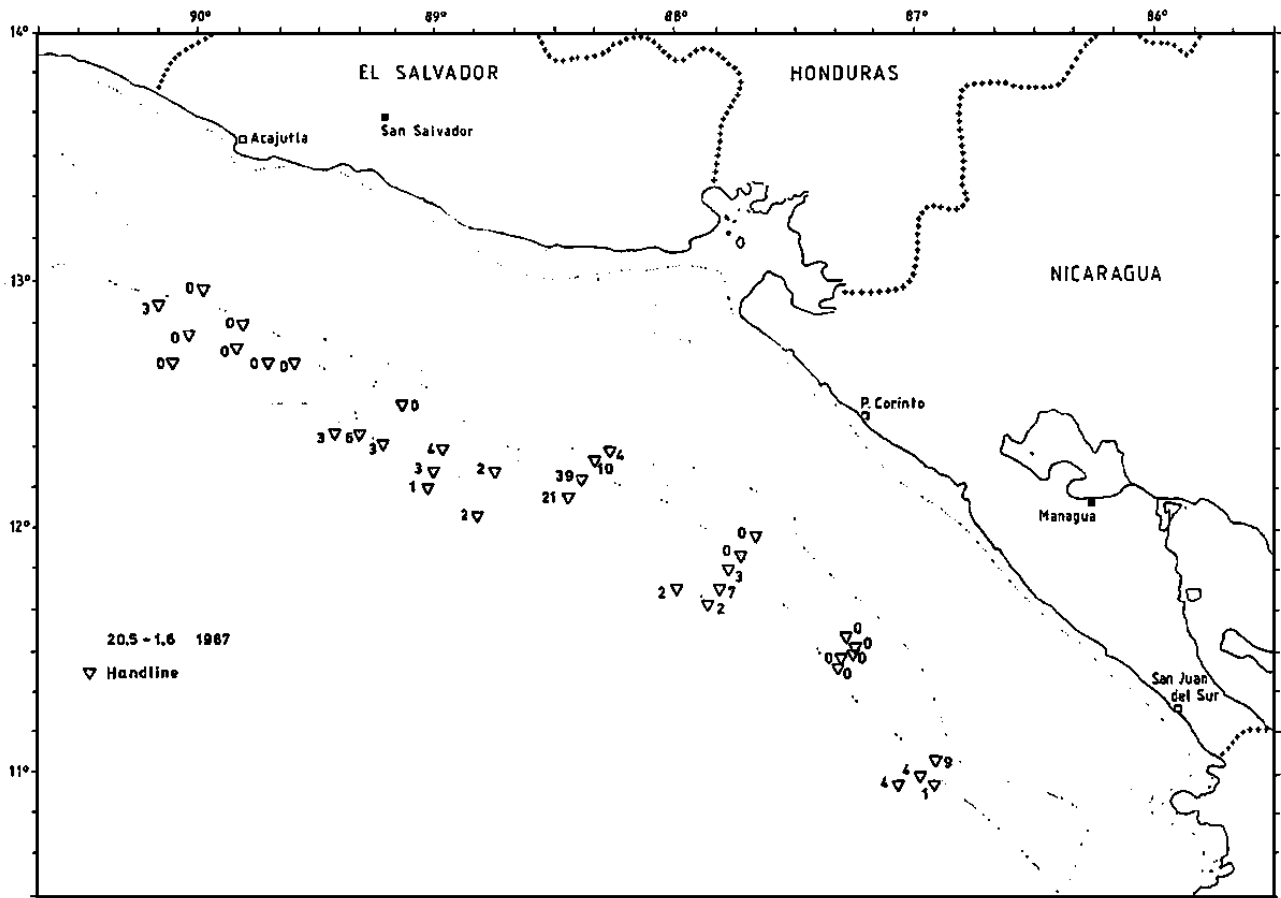
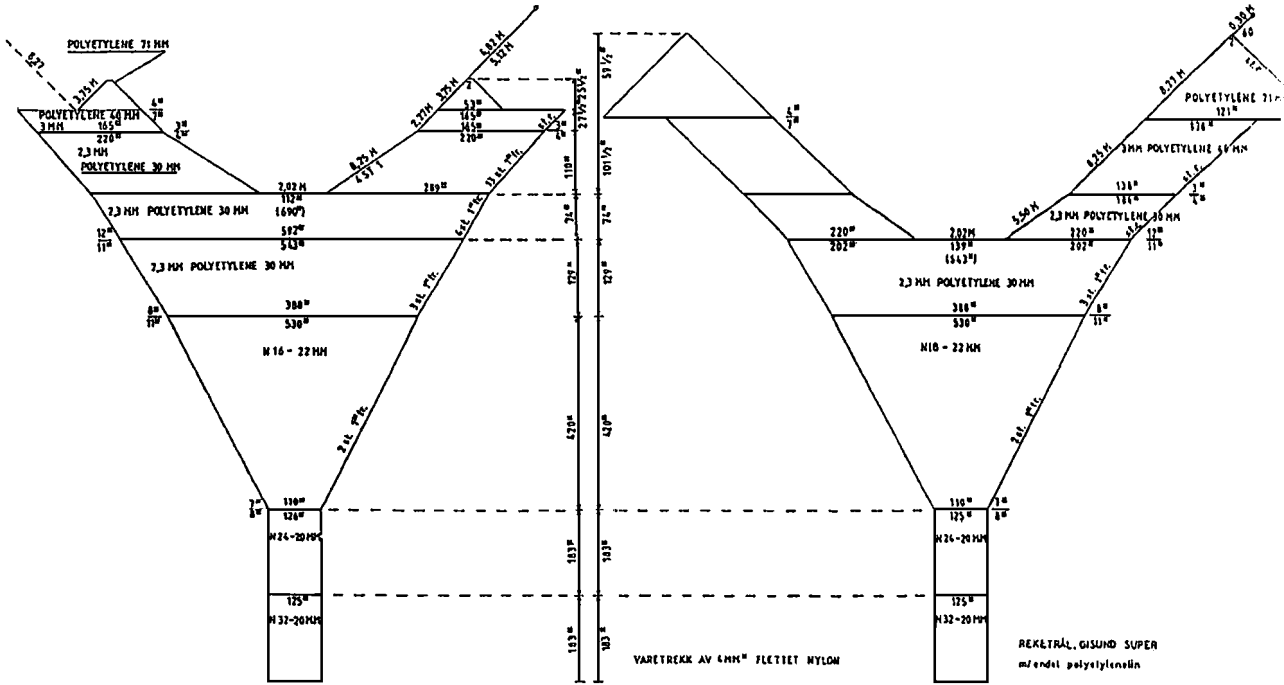


FIGURE 5. NUMBER OF SQUIDS CAUGHT BY TWO HAND JIGGING IN 30 MIN. EXPERIMENTS -  
 FIGURA 5. CANTIDAD DE CALAMARES OCEANICOS CAPTURADOS CON DOS POTERAS MANUALES  
 DURANTE PESCAS DE 30 MIN.





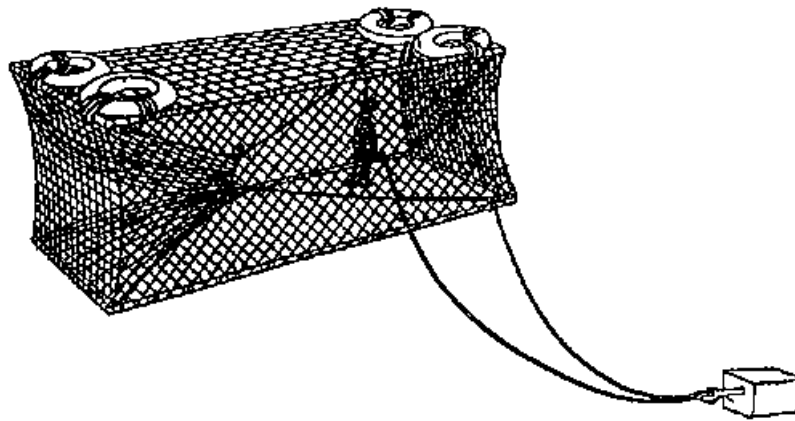
# ANNEX 1. DESCRIPTION OF TRAWL AND FISH TRAPS - APENDICE 1. DESCRIPCION DE RED DE ARRASTRE Y TRAMPAS



Upper part  
 Headline 41 m  
 Sweep 40 m

Lower part  
 Groundrope 47 m  
 Sweep 40 m

Fishtrap, 130 x 45 x 45 cm





Synodus evermanni	35.20	2552	5.36
Diplectrum labarum	13.20	484	2.01
Lepophidium pardale	0.00	44	
Lophiodes caularis	0.00	44	
Symphurus atramentatus	0.00	44	
Hippoglossina tetrophthalmus	0.00	44	
Mursia gaudichaudii	0.00	44	
OPHICHTHIDAE	0.00	132	
Cynoscion phoxocephalus	0.00	264	
Trichiurus nitens	0.00	352	
Total	655.60		99.94

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 340  
PROJECT: LA

DATE: 5/21/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1119  
start stop duration Long W 8600  
TIME: 11:05:00 11:35:00 30 (min) Purpose code: 3  
LOG: 5437.10 5438.40 1.30 Area code: 4  
FDEPTH: 47 51 GearCond. code: 1  
BDEPTH: 47 51 Validity code: 3  
Towing dir: 300° Wire out: 200 m Speed: 28 kn\*10  
Sorted: 18 Kg Total catch: 727.20 CATCH/HOUR: 1454.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Anchoa argentivittata	992.00	288920	68.20	
Synodus evermanni	88.00	960	6.05	
Cyclopsetta sp.	83.00	400	5.70	
Sphyraena sp	64.00	400	4.40	
Selene brevoorti	48.00	880	3.30	
Pomadasys panamensis	48.00	400	3.30	
Peprilus medius	40.00	160	2.75	
Polydactylus opercularis	32.00	160	2.20	
Porichthys margaritatus	16.00	640	1.10	
Cyclopsetta sp.	8.00	560	0.55	
Cyclopsetta querna	8.00	640	0.55	
Pseudupeneus grandisquamis	8.00	80	0.55	
Cynoscion reticulatus	5.40	2	0.37	
Lutjanus colorado	3.00	2	0.20	
Micropogonias altipinnis	2.00	2	0.13	
Paralabrax sp	0.80	2	0.05	
Total	1446.20		99.40	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 341  
PROJECT: LA

DATE: 5/21/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1123  
start stop duration Long W 8602  
TIME: 12:17:00 12:35:00 18 (min) Purpose code: 3  
LOG: 5443.70 5444.40 0.70 Area code: 4  
FDEPTH: 29 34 GearCond. code: 1  
BDEPTH: 29 34 Validity code: 3  
Towing dir: 140° Wire out: 100 m Speed: 28 kn\*10  
Sorted: 25 Kg Total catch: 179.50 CATCH/HOUR: 598.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Diapterus peruvianus	121.33	349	20.27	
Polydactylus approximans	118.99	606	19.88	

Selene brevoorti	88.66	1213	14.81	
Alectis ciliaris	46.66	116	7.79	
Micropogonias altipinnis	41.99	93	7.01	
Larimus gulosus	41.99	93	7.01	
Callinectes sp	27.99	653	4.67	
Anchoa argentivittata	27.99	2473	4.67	128
Anisotremus dovii	16.33	23	2.72	
Sphyraena sp	13.99	23	2.33	
Panulirus gracilis	13.33	49	2.22	
Rhinobatos sp.	11.66	23	1.94	
Cyclopsetta sp.	11.66	139	1.94	
Squilla sp	6.99	373	1.16	
Opistherus equitorialis	4.66	69	0.77	
Bagre panamensis	2.33	23	0.38	
Epinephelus analogus	1.66	3	0.27	
Total	598.21		99.84	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 342

DATE: 5/21/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1137  
Long W 8625

	start	stop	duration	Purpose code:	3
TIME:	17:40:00	17:58:00	18 (min)	Area code:	4
LOG:	5496.70	5497.40	0.70	GearCond. code:	5
FDEPTH:	18	18		Validity code:	3
BDEPTH:	18	18			

Towing dir: 122°

Wire out: 100 m

Speed: 32 kn\*10

Sorted: 120 Kg

Total catch: 171.00

CATCH/HOUR: 569.99

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight	numbers	
Lutjanus guttatus	256.99	309	129
Lutjanus colorado	39.99	3	
Larimus effulgens	34.99	169	
Selene peruvianus	34.99	219	
Centropomus medius	24.99	3	
Epinephelus guttatus	24.99	3	
Polydactylus opercularis	20.99	109	
Opisthopterus dovii	14.99	809	
Sphoeroides sp	13.99	9	
Panulirus gracilis	13.33	36	
Sphyraena ensis	12.99	269	
Anisotremus dovii	11.99	39	
Lutjanus argentiventris	11.66	19	
Larimus argenteus	5.29	19	
Anchoa sp	5.19	2429	
Scomberomorus sierra	4.99	9	
Arius jordani	4.99	39	
Elattarchus archidium	4.99	19	
Xenichthys xanti	4.99	59	
Umbrina canariensis	3.99	9	
Cyclopsetta querna	3.99	59	
Euphylax sp.	2.99	39	
Calamus brachysomus	2.99	9	
Callinectes toxotes	1.99	29	
SCIAENIDAE	1.49	19	
Stellifer sp	0.99	329	
Penaeus vannamei	0.99	19	
Loliopsis diomedeeae	0.99	249	
Opisthonema sp	0.99	119	
SCIAENIDAE	0.99	89	

APOGONIDAE	0.00	9	
TORPEDINIDAE	0.00	9	
Mycteroperca sp	0.00	9	
Selar crumenophthalmus	0.00	9	
Trachypenaeus sp	0.00	19	
Oligoplites sp	0.00	19	
Chloroscombrus orqueta	0.00	19	
Total	569.71		99.80

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 343  
PROJECT: LA

DATE: 5/22/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1101  
Long W 8601  
start stop duration  
TIME: 06:55:00 07:25:00 30 (min) Purpose code: 3  
LOG: 5600.40 5601.20 0.80 Area code: 4  
FDEPTH: 150 148 GearCond. code: 1  
BDEPTH: 150 148 Validity code: 3  
Towing dir: 327° Wire out: 600 m Speed: 15 kn\*10  
Sorted: 31 Kg Total catch: 3000.00 CATCH/HOUR: 6000.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trichiurus nitens	2571.40	70284	42.85	
Diplectrum macropoma	2304.80	65456	38.41	130
Argentina alicae	761.80	35772	12.69	131
Diplectrum maximum	361.80	10854	6.03	132
CALLIONYMIDAE	0.00	190		
Citharichthys sp	0.00	1334		
Total	5999.80		99.98	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 344  
PROJECT: LA

DATE: 5/22/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1116  
Long W 8658  
start stop duration  
TIME: 10:50:00 11:20:00 30 (min) Purpose code: 3  
LOG: 5632.40 5633.20 0.80 Area code: 4  
FDEPTH: 252 290 GearCond. code: 1  
BDEPTH: 252 290 Validity code: 3  
Towing dir: 320° Wire out: 900 m Speed: 16 kn\*10  
Sorted: 23 Kg Total catch: 6000.00 CATCH/HOUR: 12000.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Heterocarpus vicarius	6460.00	2347692	53.83	134
Pleuroncodes planipes	4922.00	297352	41.01	133
Diplectrum sp	358.00	8204	2.98	
Argentina alicae	256.00	6152	2.13	
Scorpaena sp	0.00	512		
Total	11996.00		99.95	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 345  
PROJECT: LA

DATE: 5/22/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1117  
Long W 8700  
start stop duration  
TIME: 12:40:00 12:56:00 16 (min) Purpose code: 3  
LOG: 5637.10 5637.60 0.50 Area code: 4  
FDEPTH: 370 375 GearCond. code: 1

BDEPTH: 370 375 Validity code: 3  
 Towing dir: 330° Wire out: 1250 m Speed: 25 kn\*10  
 Sorted: 32 Kg Total catch: 222.60 CATCH/HOUR: 834.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Cherublemma emmelas	572.25	36787	68.55	
Merluccius angustimanus	262.50	49218	31.44	
Total	834.75		99.99	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 346  
 PROJECT: LA

DATE: 5/22/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1122  
 start stop duration Long W 8704  
 TIME: 14:34:00 15:06:00 32 (min) Purpose code: 3  
 LOG: 5649.00 5650.00 1.00 Area code: 4  
 FDEPTH: 404 380 GearCond. code: 1  
 BDEPTH: 404 380 Validity code: 3  
 Towing dir: 330° Wire out: 1350 m Speed: 20 kn\*10  
 Sorted: 28 Kg Total catch: 46.90 CATCH/HOUR: 87.93

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Cherublemma emmelas	78.75	10181	89.55	
Echinorhinus cookei	8.43	1	9.58	
Merluccius angustimanus	0.84	16	0.95	
Total	88.02		100.08	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 347  
 PROJECT: LA

DATE: 5/22/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1125  
 start stop duration Long W 8708  
 TIME: 16:02:00 16:35:00 33 (min) Purpose code: 3  
 LOG: 5653.80 5654.80 1.00 Area code: 4  
 FDEPTH: 310 300 GearCond. code: 1  
 BDEPTH: 310 300 Validity code: 3  
 Towing dir: 307° Wire out: 1100 m Speed: 20 kn\*10  
 Sorted: 28 Kg Total catch: 284.50 CATCH/HOUR: 517.27

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius angustimanus	234.54	5863	45.34	135
Cherublemma emmelas	145.45	18803	28.11	
Heterocarpus vicarius	136.36	39545	26.36	
MYCTOPHIDAE	0.90	418	0.17	
Total	517.25		99.98	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 348  
 PROJECT: LA

DATE: 5/22/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1125  
 start stop duration Long W 8706  
 TIME: 17:42:00 18:12:00 30 (min) Purpose code: 3  
 LOG: 5661.70 5663.00 1.30 Area code: 4  
 FDEPTH: 190 185 GearCond. code: 1  
 BDEPTH: 190 185 Validity code: 3  
 Towing dir: 307° Wire out: 750 m Speed: 25 kn\*10

Sorted: 14 Kg

Total catch: 321.60

CATCH/HOUR: 643.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Argentina aliceeae	528.00	24536	82.08	136
MYCTOPHIDAE	43.20		6.71	
Mursia gaudichaudii	38.40	720	5.97	
Solenocera agassizii	14.40	1500	2.23	137
Pontinus dubius	14.40	720	2.23	
Citharichthys sordidus	4.80	384	0.74	
Zalieutes elater	0.00	48		
Lophiodes caularis	0.00	48		
Diplectrum maximum	0.00	48		
Symphurus atramentatus	0.00	96		
Monolene maculipinna	0.00	528		
Total	643.20		99.96	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 349

DATE: 5/22/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1132  
Long W 8715

	start	stop	duration	Purpose code:	
TIME:	23:55:00	24:25:00	30 (min)		3
LOG:	5684.00	5684.90	0.90	Area code:	4
FDEPTH:	350	363		GearCond. code:	1
BDEPTH:	350	363		Validity code:	3

Towing dir: 324°

Wire out: 1200 m

Speed: 18 kn\*10

Sorted: 24 Kg

Total catch: 48.80

CATCH/HOUR: 97.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Cherublemma emmelas	84.00	10860	86.06	
Trichiurus nitens	6.80	64	6.96	
Merluccius angustimanus	4.80	108	4.91	
Dosidiscus gigas	2.00	4	2.04	
Total	97.60		99.97	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 350

DATE: 5/23/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1135  
Long W 8717

	start	stop	duration	Purpose code:	
TIME:	02:05:00	02:38:00	33 (min)		3
LOG:	5690.10	5690.90	0.80	Area code:	4
FDEPTH:	277	286		GearCond. code:	1
BDEPTH:	277	286		Validity code:	3

Towing dir: 333°

Wire out: 900 m

Speed: 20 kn\*10

Sorted: 18 Kg

Total catch: 4000.00

CATCH/HOUR: 7272.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	7076.36	427321	97.30	
Cherublemma emmelas	116.36	14938	1.59	
Heterocarpus vicarius	78.18	18476	1.07	
Total	7270.90		99.96	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 351

DATE: 5/23/87  
start stop duration  
TIME: 04:17:00 04:47:00 30 (min) Purpose code: 1  
LOG: 5699.60 5700.60 1.00 Area code: 4  
FDEPTH: 70 70 GearCond. code: 3  
BDEPTH: 155 178 Validity code: 3  
Towing dir: 280° Wire out: 200 m Speed: 20 kn\*10  
Sorted: 4 Kg Total catch: 4.60 CATCH/HOUR: 9.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trichiurus nitens	8.60	80	93.47	
Peprilus snyderi	0.60	2	6.52	
Total	9.20		99.99	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 352

DATE: 5/23/87  
start stop duration  
TIME: 07:30:00 08:00:00 30 (min) Purpose code: 3  
LOG: 5724.50 5726.30 1.80 Area code: 4  
FDEPTH: 119 121 GearCond. code: 1  
BDEPTH: 119 121 Validity code: 3  
Towing dir: 116° Wire out: 450 m Speed: 32 kn\*10  
Sorted: 14 Kg Total catch: 7000.00 CATCH/HOUR: 14000.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	4814.00	630196	34.38	138
Prionotus ruscarius	3635.00	69904	25.96	139
Peprilus snyderi	2849.20	31910	20.35	140
Peprilus medius	2259.80	36904	16.14	141
Diplectrum euryplectrum	196.40	1964	1.40	
Cynoscion stolzmanni	147.40	4912	1.05	
Pontinus dubius	98.20	4912	0.70	
Symphurus sp	0.00	982		
Engyophrys sancti-laurenti	0.00	982		
Monolene maculipinna	0.00	982		
GOBIIDAE	0.00	982		
Loliopsis diomedea	0.00	2948		
Total	14000.00		99.98	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 353

DATE: 5/23/87  
start stop duration  
TIME: 10:05:00 10:25:00 20 (min) Purpose code: 3  
LOG: 5740.90 5741.80 0.90 Area code: 4  
FDEPTH: 70 70 GearCond. code: 1  
BDEPTH: 70 70 Validity code: 3  
Towing dir: 315° Wire out: 300 m Speed: 29 kn\*10  
Sorted: 18 Kg Total catch: 214.90 CATCH/HOUR: 644.70



SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Carangoides dorsalis	172.50	375	26.75	
Diapterus aureolus	126.00	9519	19.54	
RAJIDAE	90.00	3	13.95	
Synodus evermanni	54.00	630	8.37	
Selene peruvianus	36.00	930	5.58	
Diplectrum eumelum	24.00	390	3.72	
Cyclopsetta querna	18.00	360	2.79	
Prionotus ruscarius	18.00	330	2.79	
Citharichthys sp	15.00	1320	2.32	
Rhizoprionodon longuris	11.25	6	1.74	
Peprilus snyderi	9.00	60	1.39	
Scorpaena sp	7.50	480	1.16	
Loliopsis diomedea	7.50		1.16	
Zalieutes elater	6.00	210	0.93	
Porichthys margaritatus	6.00	690	0.93	
Pseudupeneus grandisquamis	6.00	210	0.93	
Anchoa argentivittata	6.00	270	0.93	
Pseudorhombus dendritica	4.50	30	0.69	
Hippoglossina tetraphthalmus	4.50	330	0.69	
Epinephelus niveatus	3.90	6	0.60	
Cynoscion reticulatus	3.90	6	0.60	
Epinephelus analogus	3.60	6	0.55	
Lutjanus peru	3.60	6	0.55	
Engyophrys sancti-laurenti	3.00	360	0.46	
Pristigenys serrula	3.00	6	0.46	
Penaeus brevisrostris	1.50	51	0.23	
Mustelus sp	0.60	3	0.09	
Penaeus californiensis	0.00	6		
Eucinostomus argenteus	0.00	30		
Sicyonia sp	0.00	51		
Orthopristis sp	0.00	150		
Total	644.85		99.90	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 354

DATE: 5/23/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1145  
Long W 8636

start stop

duration

TIME: 11:55:00 12:27:00 32 (min) Purpose code: 3

LOG: 5754.40 5756.00 1.60 Area code: 4

FDEPTH: 20 21 GearCond. code: 1

BDEPTH: 20 21 Validity code: 3

Towing dir: 320°

Wire out: 100 m

Speed: 30 kn\*10

Sorted: 22 Kg

Total catch: 92.20

CATCH/HOUR: 172.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Anchoa argentivittata	56.25	7140	32.53	142
Sphyraena ensis	41.25	232	23.86	
Stellifer minor	13.50	1788	7.80	
Synodus evermanni	6.75	75	3.90	
Haemulopsis axillaris	5.25	32	3.03	
Selene peruvianus	5.25	112	3.03	
Lutjanus guttatus	5.25	60	3.03	
Cyclopsetta querna	3.75	52	2.16	
Pseudobalistes naufragium	3.75	7	2.16	
Panulirus gracilis	3.37	16	1.94	
Micropogonias altipinnis	3.00	15	1.73	
Penaeus vannamei	3.00	41	1.73	

Carangoides dorsal is	2.25	7	1.30
Hemicarax zelotes	2.25	7	1.30
Hemicarax leucurus	2.25	7	1.30
Diapterus aureolus	2.25	45	1.30
Scomberomorus sierra	2.25	7	1.30
Symphurus sp	1.50	30	0.86
Diapterus peruvianus	1.50	22	0.86
Pseudupeneus grandisquamis	1.50	22	0.86
Albula vulpes	1.50	7	0.86
Polydactylus approximans	1.50	37	0.86
Opistherus equitorialis	1.50	60	0.86
Chaetodipterus zonatus	0.75	15	0.43
Chloroscombrus orqueta	0.75	7	0.43
Alectis ciliaris	0.37	7	0.21
Cyclopsetta sp.	0.37	82	0.21
Isopisthus remifer	0.00	15	
Larimus acclivis	0.00		
Orthopristis sp	0.00	22	
Arius sp	0.00	22	
Oligoplites refulgens	0.00	7	
Xenichthys xanti	0.00	15	
Opisthopterus dovii	0.00		
Bairdiella chrysoleuca	0.00	150	
Total	172.86		99.84

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 355

DATE: 5/23/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1150  
Long W 8645

TIME:	start	stop	duration	Purpose code:	3
LOG:	13:55:00	14:25:00	30 (min)	Area code:	4
FDEPTH:	5766.20	5767.70	1.50	GearCond. code:	1
BDEPTH:	35	35		Validity code:	3

Towing dir: 330°

Wire out: 150 m

Speed: 30 kn\*10

Sorted: 21 Kg

Total catch: 153.60

CATCH/HOUR: 307.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Sphyraena ensis	53.20	686	17.31	
Diapterus peruvianus	51.80	126	16.86	
Bairdiella chrysoleuca	42.00	2888	13.67	
Anchoa argentivittata	42.00	10604	13.67	
Cynoscion reticulatus	37.80	2174	12.30	
Panulirus gracilis	10.40	72	3.38	
Elattarchus archidium	8.40	238	2.73	
Isopisthus remifer	7.00	28	2.27	
Polydactylus approximans	7.00	70	2.27	
Penaeus vannamei	6.00	88	1.95	
Lepophidium prorates	5.60	84	1.82	
Opistherus equitorialis	5.60	84	1.82	
Pepilus medius	4.20	14	1.36	
Parapsettus panamensis	2.80	14	0.91	
Cyclopsetta sp.	2.80	98	0.91	
Selene peruvianus	2.80	252	0.91	
Synodus evermanni	2.80	42	0.91	
Trichiurus nitens	2.80	196	0.91	
Opisthopterus dovii	2.80	238	0.91	
Sphyraena ensis	2.80	350	0.91	
Pomadasys panamensis	1.40	14	0.45	
Sicyonia sp	1.40	350	0.45	

Squilla sp	1.40	252	0.45
Lolliguncula panamensis	1.40	238	0.45
CYNOGLOSSIDAE	0.70	28	0.22
Penaeus brevirostris	0.40	2	0.13
Loliopsis diomedea	0.00	84	
Cyclopsetta querna	0.00	280	
Total	307.30		99.93

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 356

DATE: 5/23/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1154  
Long W 8653

	start	stop	duration	Purpose code:	1
TIME:	16:30:00	17:00:00	30 (min)	Area code:	4
LOG:	5787.30	5788.80	1.50	GearCond. code:	1
FDEPTH:	75	75		Validity code:	3
BDEPTH:	75	75			

Towing dir: 141°

Wire out: 350 m

Speed: 30 kn\*10

Sorted: 21 Kg

Total catch: 223.40

CATCH/HOUR: 446.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Anchoa argentivittata	176.00	62700	39.39	
Larimus acclivis	80.00	2520	17.90	143
Porichthys margaritatus	28.80	4000	6.44	
Cyclopsetta querna	27.20	416	6.08	
Polydactylus opercularis	27.20	224	6.08	
Prionotus sp	16.00	48	3.58	
Synodus evermanni	16.00	432	3.58	
Diapterus aureolus	12.80	720	2.86	
Squilla sp	11.20	1072	2.50	
Selene peruvianus	9.60	432	2.14	
Penaeus brevirostris	9.60	336	2.14	144
Cyclopsetta sp.	8.00	752	1.79	
Solenocera agassizii	6.40	2912	1.43	
Arius sp	4.80	16	1.07	
Lepophidium prorates	3.20	48	0.71	
Bagre sp	3.20	16	0.71	
Loliopsis diomedea	2.80	496	0.62	
GOBIIDAE	1.60	128	0.35	
Peprilus medius	1.60	16	0.35	
Sicyonia sp	0.80	80	0.17	
Pomadasys panamensis	0.00	16		
Prionotus sp	0.00	160		
Total	446.80		99.89	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 357

DATE: 5/23/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1156  
Long W 8655

	start	stop	duration	Purpose code:	3
TIME:	17:46:00	18:16:00	30 (min)	Area code:	4
LOG:	5793.90	5795.40	1.50	GearCond. code:	1
FDEPTH:	75	75		Validity code:	3
BDEPTH:	75	75			

Towing dir: 316°

Wire out: 300 m

Speed: 30 kn\*10

Sorted: 10 Kg

Total catch: 131.80

CATCH/HOUR: 263.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Porichthys margaritatus	64.00		24.27	
Squilla sp	38.40	2624	14.56	
Larimus acclivis	24.80	720	9.40	
Diapterus aureolus	24.00	1872	9.10	
GOBIIDAE	19.20	1152	7.28	
Anchoa sp	19.20	768	7.28	
Solenocera mutator	16.00		6.06	
Sphyraena ensis	11.20	128	4.24	
Cyclopsetta sp.	8.00	496	3.03	
Synodus evermanni	8.00	320	3.03	
Polydactylus opercularis	6.40	80	2.42	
Arius sp	6.00	4	2.27	
Selene peruvianus	5.60	240	2.12	
Penaeus brevirostris	5.02	176	1.90	145
Cyclopsetta querna	4.80	112	1.82	
Opistherus equitorialis	1.28	48	0.48	
Lutjanus peru	0.80	4	0.30	
Prionotus sp	0.80	16	0.30	
Engyophrys sancti-laurenti	0.00	16		
Bairdiella chrysoleuca	0.00	16		
Pomadasys panamensis	0.00	32		
Opisthonema sp	0.00	48		
Synodus evermanni	0.00	64		
Penaeus californiensis	0.00	128		
Lepophidium prorates	0.00	128		
OPHICHTHIDAE	0.00	256		
Total	263.50		99.86	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 358

DATE: 5/23/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1208  
Long W 8654

	start	stop	duration	Purpose code:	
TIME:	20:05:00	20:35:00	30 (min)		3
LOG:	5811.40	5812.90	1.50	Area code:	4
FDEPTH:	32	35		GearCond. code:	1
BDEPTH:	32	35		Validity code:	3

Towing dir: 161°

Wire out: 150 m

Speed: 30 kn\*10

Sorted: 6 Kg

Total catch: 85.90

CATCH/HOUR: 171.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Bairdiella chrysoleuca	30.40	3892	17.69	
Lepophidium prorates	14.40	416	8.38	
Opisthopterus dovii	14.40	2720	8.38	
Pomadasys panamensis	14.20	62	8.26	
Anchoa sp	10.40	1984	6.05	
Polydactylus opercularis	9.00	48	5.23	
Larimus argenteus	8.80	158	5.12	
Xiphopenaeus riveti	8.80	1376	5.12	
Cyclopsetta querna	8.00	144	4.65	
Lutjanus guttatus	7.60	8	4.42	
Shrimps. small. non comm.	6.40		3.72	
Isopisthus remifer	6.40	528	3.72	
Micropogonias altipinnis	5.60	2	3.25	
Selene peruvianus	5.60	400	3.25	
Scomberomorus sierra	4.60	2	2.67	
Diapterus peruvianus	4.60	14	2.67	

Anchovia macrolepidota	3.20	32	1.86
Polydactylus approximans	3.20	208	1.86
Cyclopsetta sp.	2.40	64	1.39
Squilla sp	1.60		0.93
Arius sp	1.20	2	0.69
Penaeus vannamei	0.40	6	0.23
Penaeus stylirostris	0.40	2	0.23
Opisthonema sp	0.30	2	0.17
RAJIDAE	0.00	2	
Anchoa sp	0.00	16	
Lolliguncula panamensis	0.00	32	
Porichthys margaritatus	0.00	48	
OPHICHTHIDAE	0.00	48	
Opistherus equitorialis	0.00	64	
Sicyonia disdorsalis	0.00	96	
Total	171.90		99.94

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 359

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1138  
Long W 8720

	start	stop	duration	Purpose code:	3
TIME:	04:00:00	04:34:00	34 (min)	Area code:	4
LOG:	5866.60	5867.60	1.00	GearCond. code:	1
FDEPTH:	338	348		Validity code:	3
BDEPTH:	338	348			

Towing dir: 325°

Wire out: 1100 m

Speed: 20 kn\*10

Sorted: 35 Kg

Total catch: 58.60

CATCH/HOUR: 103.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Cherublemma emmelas	79.41	10058	76.79	
Merluccius angustimanus	11.82	192	11.43	146
Dosidiscus gigas	11.47	1	11.09	
Trichiurus nitens	0.52	5	0.50	
Total	103.22		99.81	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 360

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1151  
Long W 8724

	start	stop	duration	Purpose code:	3
TIME:	06:10:00	06:40:00	30 (min)	Area code:	4
LOG:	5879.70	5881.00	1.30	GearCond. code:	1
FDEPTH:	148	145		Validity code:	3
BDEPTH:	148	145			

Towing dir: 330°

Wire out: 600 m

Speed: 26 kn\*10

Sorted: 72 Kg

Total catch: 916.80

CATCH/HOUR: 1833.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Peprilus medius	747.40	13312	40.76	147
Pleuroncodes planipes	595.40	30008	32.47	148
Peprilus snyderi	392.60	6506	21.41	149
Trichiurus nitens	30.40	1090	1.65	
Argentina aliciae	13.60	684	0.74	
Pontinus dubius	13.20	658	0.71	
Cyclopsetta sp.	12.80	1292	0.69	
Cynoscion stolzmanni	7.60	254	0.41	
Cyclopsetta querna	5.00	278	0.27	

Anthias sp.	5.00	126	0.27
Prionotus ruscarius	2.60	76	0.14
GOBIIDAE	2.60	202	0.14
Cherublemma emmelas	2.60	278	0.14
Squilla sp	2.60	50	0.14
Symphurus atramentatus	0.20	102	0.01
Physiculus talarae	0.00	26	
Diplectrum eumelum	0.00	50	
Loliopsis diomedea	0.00	152	
Total	1833.60		99.95

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 361

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1215  
Long W 8711

	start	stop	duration	Purpose code:	3
TIME:	09:40:00	10:10:00	30 (min)	Area code:	4
LOG:	5908.40	5909.80	1.40	GearCond. code:	1
FDEPTH:	57	49		Validity code:	3
BDEPTH:	57	49			

Towing dir: 40°

Wire out: 250 m

Speed: 29 kn\*10

Sorted: 49 Kg

Total catch: 228.60

CATCH/HOUR: 457.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Diapterus peruvianus	129.00	570	28.21	
Anchoa argentivittata	33.60	9072	7.34	
Polydactylus approximans	30.60	642	6.69	
Selene peruvianus	24.00	744	5.24	
Sphyrna ensis	21.60	216	4.72	
Pomadasys panamensis	19.20	186	4.19	
Prionotus horrens	15.20	120	4.19	
Cyclopsetta sp.	15.60	1008	3.41	
Rhizoprionodon longuris	15.00	12	3.28	
Centropomus sp	14.00	2	3.06	
Penaeus californiensis	12.30	1522	2.69	150
Polydactylus opercularis	12.00	78	2.62	
Synodus evermanni	12.00	24	2.62	
Carangoides dorsalis	10.20	6	2.23	
Porichthys margaritatus	8.40	576	1.83	
Larimus effulgens	7.20	72	1.57	
Trachinotus kennedyi	7.20	6	1.57	
Sphyrna lewini	6.00	12	1.31	
Isopisthus remifer	6.00	48	1.31	
Cyclopsetta querna	4.80	432	1.04	
Kathetotoma averruncus	4.80	24	1.04	
Parapsettus panamensis	4.80	24	1.04	
Bairdiella chrysoleuca	4.80	2040	1.04	
Lolliguncula panamensis	4.80	456	1.04	
Opisthopterus dovii	4.80	432	1.04	
Opistherus equatorialis	3.60	72	0.78	
Pseudupeneus grandisquamis	3.60	48	0.78	
Lutjanus argentiventris	3.60	2	0.78	
Bagre panamensis	3.60	6	0.78	
Trichiurus nitens	2.40	96	0.52	
Lepophidium prorates	2.40	48	0.52	
Eucinostomus argenteus	2.40	24	0.52	
Cynoscion reticulatus	2.40	6	0.52	
Opisthonema libertate	1.50	12	0.32	
Squilla sp	1.20	216	0.26	
GOBIIDAE	1.20	96	0.26	

Lutjanus guttatus	0.60	6	0.13
Evibacus princeps	0.50	2	0.10
Haemulopsis sp	0.00	48	
Prionotus sp	0.00	48	
SICYONIIDAE	0.00	72	
Total	460.90		100.59

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 362

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1219  
Long W 8703

	start	stop	duration	Purpose code:	3
TIME:	11:05:00	11:35:00	30 (min)	Area code:	4
LOG:	5917.20	5918.50	1.30	GearCond. code:	1
FDEPTH:	22	23		Validity code:	3
BDEPTH:	22	23			

Towing dir: 300°

Wire out: 100 m

Speed: 28 kn\*10

Sorted: 30 Kg

Total catch: 161.40

CATCH/HOUR: 322.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Diapterus peruvianus	42.00	180	13.01	
Lutjanus guttatus	38.20	70	11.83	
Sphyrna lewini	36.00	66	11.15	
Selene peruvianus	26.40	630	8.17	
Isopisthus remifer	20.00	2382	6.19	
Larimus argenteus	17.40	54	5.39	
Cynoscion phoxocephalus	17.20	4	5.32	
Anchoa argentivittata	16.80	4848	5.20	
Larimus acclivis	15.00	2274	4.64	
Bairdiella chrysoleuca	13.20	2262	4.03	
Opisthopterus dovii	12.00	3120	3.71	
Centropomus medius	9.00	42	2.78	
Polydactylus approximans	9.00	90	2.78	
Sphyrna ensis	8.40	102	2.60	
Rhizoprionodon longuris	7.20	6	2.23	
Trachypenaeus sp	4.20	414	1.30	
Chloroscombrus orqueta	4.20	96	1.30	
Cynoscion sp	3.00	36	0.92	
Opistherus equitorialis	3.00	60	0.92	
Penaeus vannamei	2.40	54	0.74	
Loliopsis diomedae	2.40	336	0.74	
Opisthonema libertate	2.40	528	0.74	
Haemulopsis sp	1.80	6	0.55	
Cynoscion reticulatus	1.80	6	0.55	
Micropogonias altipinnis	1.20	6	0.37	
Paralonchurus dumerilii	1.20	6	0.37	
Oligoplites saurus inornatus	1.20	12	0.37	
Cyclopsetta querna	0.60	6	0.18	
Hemicaranx sp	0.60	6	0.18	
Diapterus aureolus	0.60	6	0.18	
Pomadasys panamensis	0.60	6	0.18	
Orthopristis chalceus	0.60	6	0.18	
Xenichthys xanti	0.60	6	0.18	
Scomberomorus sierra	0.60	6	0.18	
Total	320.80		99.21	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 363

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1228  
Long W 8717

	start	stop	duration	Purpose code:	3
TIME:	13:07:00	13:35:00	28 (min)	Area code:	4
LOG:	5932.30	5933.70	1.40	GearCond. code:	1
FDEPTH:	28	27		Validity code:	3
BDEPTH:	28	27			

Towing dir: 321°

Wire out: 150 m

Speed: 30 kn\*10

Sorted: 48 Kg

Total catch: 244.00

CATCH/HOUR: 522.85

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Diapterus peruvianus	197.57	1069	37.78	151
Sphyraena ensis	86.78	404	16.59	
Lutjanus guttatus	35.99	47	6.88	152
Larimus argenteus	30.85	162	5.90	
Polydactylus approximans	17.35	192	3.31	
Anchoa argentivittata	14.99	4679	2.86	
Bairdiella chrysoleuca	14.35	77	2.74	
Larimus acclivis	14.35	134	2.74	
Bairdiella sp	12.21	771	2.33	
Scomberomorus sierra	9.64	19	1.84	
Penaeus vannamei	7.71	115	1.47	
Trachinotus sp	7.71	8	1.47	
Opisthopterus dovii	7.49	1244	1.43	
Cynoscion phoxocephalus	6.64	8	1.26	
Arius sp	5.78	47	1.10	
Cynoscion reticulatus	5.78	8	1.10	
Lutjanus argentiventris	5.57	4	1.06	
Centropomus medius	4.71	19	0.90	
Bagre panamensis	4.71	8	0.90	
Selene peruvianus	4.71	47	0.90	
Caranx hippos	4.28	2	0.81	
Opistherus equitorialis	3.85	96	0.73	
Anisotremus interruptus	2.78	8	0.53	
Carangoides vinctus	2.78	8	0.53	
Isopisthus remifer	2.78	19	0.53	
Cynoscion sp	2.78	38	0.53	
Cyclopsetta querna	1.92	27	0.36	
Chloroscombrus orqueta	1.92	19	0.36	
Opisthonema libertate	0.85	96	0.16	
Xenichthys xanti	0.85	19	0.16	
Haemulopsis elongatus	0.85	8	0.16	
Synodus evermanni	0.85	8	0.16	
Trachypenaeus sp	0.42	115	0.08	
Pomadasys panamensis	0.42	8	0.08	
CYNOGLOSSIDAE	0.42	19	0.08	
Total	522.64		99.82	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 364

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1235  
Long W 8726

	start	stop	duration	Purpose code:	3
TIME:	15:25:00	15:36:00	11 (min)	Area code:	4
LOG:	5949.90	5950.40	0.50	GearCond. code:	1
FDEPTH:	29	28		Validity code:	3
BDEPTH:	29	28			



Towing dir: 120°

Wire out: 150 m

Speed: 30 kn\*10

Sorted: 50 Kg

Total catch: 151.20

CATCH/HOUR: 824.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Anchoa argentivittata	190.90	83618	23.14	153
Sphyrna ensis	136.36	518	16.53	
Diapterus peruvianus	95.45	436	11.57	
Bairdiella sp	51.81	1292	6.28	
Lutjanus guttatus	40.90	163	4.95	154
Selene peruvianus	37.09	234	4.49	
Sphyrna lewini	34.36	54	4.16	
Polydactylus approximans	34.36	256	4.16	
Trachinotus rhodopus	27.27	54	3.30	
Scomberomorus sierra	20.18	43	2.44	
Larimus argenteus	17.99	218	2.18	
Haemulopsis elongatus	13.63	38	1.65	
Cynoscion reticulatus	13.63	10	1.65	
Carangoides vinctus	13.63	54	1.65	
Pomadasys panamensis	11.99	38	1.45	
Panulirus gracilis	10.90	16	1.32	
Chaetodipterus zonatus	10.90	10	1.32	
Bairdiella chrysoleuca	9.54	27	1.15	
Penaeus vannamei	8.18	147	0.99	
Caranx hippos	7.09	10	0.85	
Chloroscombrus orqueta	6.54	65	0.79	
Oligoplites altus	5.45	10	0.66	
Diapterus aureolus	5.45	54	0.66	
Cyclopsetta querna	3.81	163	0.46	
Micropogonias sp	3.81	10	0.46	
Anisotremus dovii	2.72	10	0.32	
Pseudupeneus grandisquamis	2.72	27	0.32	
Centropomus medius	2.72	10	0.32	
Opistherus equitorialis	2.72	38	0.32	
Isopisthus remifer	1.09	27	0.13	
Larimus acclivis	1.09	27	0.13	
CYNOGLOSSIDAE	0.54	27	0.06	
Total	824.82		99.86	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 365

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1230  
Long W 8729

	start	stop	duration	Purpose code:	
TIME:	16:21:00	16:42:00	21 (min)		3
LOG:	5956.20	5957.20	1.00	Area code:	4
FDEPTH:	52	55		GearCond. code:	1
BDEPTH:	52	55		Validity code:	3

Towing dir: 220°

Wire out: 200 m

Speed: 32 kn\*10

Sorted: 40 Kg

Total catch: 142.40

CATCH/HOUR: 406.85

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Diapterus peruvianus	109.99	574	27.03	
Anchoa argentivittata	99.99	17374	24.57	
Micropogonias altipinnis	46.28	25	11.37	
Selene peruvianus	24.85	542	6.10	
Sphyrna lewini	19.99	5	4.91	
Diapterus aureolus	17.71	705	4.35	
Lutjanus argentiventris	10.57	5	2.59	

Sphyraena ensis	9.14	91	2.24
Pomadasys panamensis	9.14	42	2.24
Synodus evermanni	7.14	114	1.75
Peprilus snyderi	7.14	42	1.75
Arius sp	5.71	5	1.40
Chloroscombrus orqueta	4.28	85	1.05
Prionotus sp	3.42	5	0.34
Xenichthys xanti	3.42	57	0.84
Epinephelus niveatus	3.42	5	0.84
Carangoides vinctus	3.42	14	0.84
Peprilus medius	3.42	2	0.84
Cyclopsetta querna	2.85	42	0.70
Cyclopsetta sp.	2.85	142	0.70
Paralabrax humeralis	2.85	5	0.70
Larimus acclivis	2.85	19	0.70
Opisthonema libertate	2.85	414	0.70
Pseudupeneus grandisquamis	1.99	48	0.48
Cetengraulis mysticetus	1.42	14	0.34
Total	406.69		99.87

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 366

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1223  
Long W 8738

TIME:	start	stop	duration	Purpose code:	3
LOG:	17:58:00	18:28:00	30 (min)	Area code:	4
FDEPTH:	5968.70	5970.30	1.60	GearCond. code:	1
BDEPTH:	80	77		Validity code:	3

Towing dir: 327°

Wire out: 350 m

Speed: 30 kn\*10

Sorted: 18 Kg

Total catch: 130.60

CATCH/HOUR: 261.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Synodus evermanni	64.00	5280	24.50	
Penaeus brevisrostris	48.40	3388	18.52	155
Diplectrum pacificum	32.00	960	12.25	
Prionotus horrens	26.60	3840	10.18	
Citharichthys sp	24.00	2934	9.18	
Mustelus dorsal is	20.80	8	7.96	
Porichthys margaritatus	16.00	3626	6.12	
Loliopsis diomedea	10.60	1014	4.05	
Engyophrys sancti-laurenti	8.00	854	3.06	
Pontinus dubius	5.40	534	2.06	
Decapterus macrosoma	5.40	54	2.06	
Cyclopsetta querna	0.00	54		
Orthopristis sp	0.00	54		
Lophiodes caularis	0.00	54		
Cyclopsetta sp.	0.00	106		
Lepophidium pardale	0.00	106		
OPHICHTHIDAE	0.00	106		
Zalieutes elater	0.00	214		
Squilla sp	0.00	746		
Total	261.20		99.94	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 367

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1206  
Long W 8753

	start	stop	duration	Purpose code:	3
TIME:	21:30:00	22:00:00	30 (min)	Area code:	4
LOG:	5997.30	5998.60	1.30	GearCond. code:	1
FDEPTH:	242	249		Validity code:	3
BDEPTH:	242	249			

Towing dir: 290°

Wire out: 900 m

Speed: 28 kn\*10

Sorted: 21 Kg

Total catch: 758.70

CATCH/HOUR: 1517.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	1051.20	38860	69.27	156
Heterocarpus vicarius	325.40	60862	21.44	157
Monolene maculipinna	37.40	5688	2.46	
Mursia gaudichaudii	21.60	432	1.42	
Dosidiscus gigas	20.60	4	1.35	
Cherublemma emmelas	14.40		0.94	
Merluccius angustimanus	14.40	504	0.94	
Plesionika sp	14.40		0.94	
Lophiodes caularis	10.80	216	0.71	
Squilla sp	7.20	2592	0.47	
MYCTOPHIDAE	0.00	72		
OPHICHTHIDAE	0.00	144		
Prinotus quiescens	0.00	144		
Total	1517.40		99.94	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 368

DATE: 5/24/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1212  
Long W 8756

	start	stop	duration	Purpose code:	3
TIME:	23:00:00	23:30:00	30 (min)	Area code:	4
LOG:	6003.90	6005.40	1.50	GearCond. code:	1
FDEPTH:	151	144		Validity code:	3
BDEPTH:	151	144			

Towing dir: 290°

Wire out: 600 m

Speed: 30 kn\*10

Sorted: 36 Kg

Total catch: 956.70

CATCH/HOUR: 1913.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	1323.00	176034	69.24	158
Trichiurus nitens	196.00	7260	10.24	
Physiculus sp	185.60	11924	9.70	
Argentina aliciae	68.80	3974	3.59	
Scorpaena sp	31.80	1272	1.66	
Cynoscion stolzmanni	31.80	5194	1.66	
Peprilus snyderi	26.40	264	1.37	
Monolene maculipinna	15.90	2226	0.83	
Diplectrum sp	10.60	530	0.55	
Symphurus atramentatus	10.60	530	0.55	
Merluccius angustimanus	5.20	476	0.27	
Cyclopsetta sp.	2.60	158	0.13	
Lophiodes caularis	2.60	52	0.13	
Total	1912.90		99.92	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 369

DATE: 5/25/87  
 start stop duration  
 TIME: 01:40:00 02:10:00 30 (min) Purpose code: 3  
 LOG: 6024.00 6025.38 1.38 Area code: 4  
 FDEPTH: 83 80 GearCond. code: 1  
 BDEPTH: 83 80 Validity code: 3  
 Towing dir: 32° Wire out: 350 m Speed: 30 kn\*10  
 Sorted: 7 Kg Total catch: 201.60 CATCH/HOUR: 403.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Prionotus ruscarius	190.40	32368	47.22	
Porichthys margaritatus	56.00	5376	13.88	
Synodus evermanni	50.40	3360	12.50	
Cyclopsetta sp.	28.00	2856	6.94	
Symphurus atramentatus	16.80	2744	4.16	
Penaeus brevirostris	16.80	784	4.16	
Diplectrum eumelum	16.80	504	4.16	
Monolene maculipinna	11.20	560	2.77	
Squilla sp	11.20	2576	2.77	
Lepophidium pardale	5.60	280	1.38	
Total	403.20		99.94	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 370

DATE: 5/25/87  
 start stop duration  
 TIME: 05:19:00 05:50:00 31 (min) Purpose code: 3  
 LOG: 6037.70 6039.10 1.40 Area code: 4  
 FDEPTH: 60 58 GearCond. code: 1  
 BDEPTH: 60 58 Validity code: 3  
 Towing dir: 320° Wire out: 250 m Speed: 30 kn\*10  
 Sorted: 8 Kg Total catch: 209.30 CATCH/HOUR: 405.09

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Anchoa argentivittata	100.64	26670	24.84	159
Selene peruvianus	42.58	1238	10.51	
Prionotus ruscarius	41.80	619	10.31	
Squilla sp	40.25		9.93	
Synodus evermanni	38.70	1316	9.55	
Cynoscion reticulatus	30.96	77	7.64	
Porichthys margaritatus	23.22	3174	5.73	
Diapterus aureolus	15.48	1316	3.82	
Symphurus atramentatus	15.48	1625	3.82	
Cyclopsetta sp.	15.48	696	3.82	
Orthopristis sp	15.48	387	3.82	
Penaeus brevirostris	10.06	348	2.48	160
Diplectrum pacificum	7.74	77	1.91	
Penaeus californiensis	5.03	479	1.24	161
Carcharhinus porosus	2.32	1	0.57	
Lolliguncula panamensis	0.00	77		
Chloroscombrus orqueta	0.00	77		
OPHICHTHIDAE	0.00	154		
Pseudupeneus grandisquamis	0.00	232		

Sphoeroides sp	0.00	464
Solenocera mutator	0.00	464
Citharichthys sp	0.00	929
Total	405.22	99.99

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 371  
PROJECT: LA

DATE: 5/25/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1247  
Long W 8742

TIME:	start	stop	duration	Purpose code:	3
LOG:	07:00:00	07:15:00	15 (min)	Area code:	4
FDEPTH:	6048.60	6049.20	0.60	GearCond. code:	8
BDEPTH:	30	30		Validity code:	3

Towing dir: 312° Wire out: 100 m Speed: 30 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight	numbers	
NO CATCH	0.00		
Total			

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 372  
PROJECT: LA

DATE: 5/25/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1300  
Long W 8744

TIME:	start	stop	duration	Purpose code:	3
LOG:	09:05:00	09:35:00	30 (min)	Area code:	4
FDEPTH:	6065.10	6066.50	1.40	GearCond. code:	1
BDEPTH:	26	26		Validity code:	3

Towing dir: 200° Wire out: 100 m Speed: 28 kn\*10

Sorted: 25 Kg Total catch: 111.10 CATCH/HOUR: 222.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight	numbers	
Opisthopterus dovii	30.00		13.50
Cynoscion phoxocephalus	18.40	2	8.28
Centropomus medius	18.40	4	8.29
Symphurus leei	15.60	276	7.02
Polydactylus opercularis	15.00	90	6.75
Polydactylus approximans	14.40	174	6.48
Peprilus medius	14.40	156	6.48
Xiphopenaeus riveti	14.40		6.48
Bairdiella chrysoleuca	11.00	1100	4.95
Selene peruvianus	6.40	516	2.88
Parapsettus panamensis	6.40	120	2.88
Achirus mazatlanus	6.40	24	2.88
Opisthonema libertate	6.00	336	2.70
Arius troscheli	4.80	24	2.16
Penaeus occidentalis	4.20	98	1.89
Bagre panamensis	3.60	40	1.62
Menticirrhus sp	3.60	60	1.62
Haemulopsis sp	3.60	96	1.62
Sphyrna ensis	3.60	48	1.62
Cyclopsetta querna	3.60	72	1.62
Trinectes fonsecensis	3.60	120	1.62
Sphyrna lewini	3.00	6	1.35
Cynoscion sp	2.40	204	1.08
Lycengraulis poeyi	2.40	108	1.08

Lile stolifera	2.40	324	1.08	
Larimus argenteus	2.40	60	1.08	
Penaeus stylirostris	2.00	36	0.90	163
Squilla sp	1.20	84	0.54	
Micropogonias ectenes	0.00	12		
Prionotus ruscarius	0.00	12		
Chloroscombrus orqueta	0.00	12		
Nebris occidentalis	0.00	12		
Lepophidium prorates	0.00	36		
Anchoa starksi	0.00	48		
Sphoeroides lobatus	0.00	720		
Total	223.20		100.44	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 373

DATE: 5/25/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1304  
Long W 8739

	start	stop	duration	Purpose code:	3
TIME:	10:30:00	11:00:00	30 (min)	Area code:	4
LOG:	6073.70	6075.00	1.30	GearCond. code:	1
FDEPTH:	13	14		Validity code:	3
BDEPTH:	13	14			

Towing dir: 53°

Wire out: 50 m

Speed: 26 kn\*10

Sorted: 6 Kg

Total catch: 61.40

CATCH/HOUR: 122.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Xiphopenaeus riveti	28.00	10640	22.80	
Cynoscion phoxocephalus	18.00	2	14.65	
Centropomus medius	18.00	4	14.65	
Penaeus vannamei	12.00	120	9.77	
Peprilus medius	9.00	90	7.32	
Opisthopterus dovii	8.00	510	6.51	
Parapsettus panamensis	7.00	130	5.70	
Trachypenaeus byrdi	6.00	360	4.88	
Scomberomorus sierra	5.00	10	4.07	
Cynoscion sp	4.00	90	3.25	
Mugil sp	2.00	10	1.62	
Selene peruvianus	2.00	70	1.62	
Polydactylus approximans	1.00	40	0.81	
Larimus sp	1.00	300	0.81	
Anchoa ischana	1.00	210	0.81	
Anchovia macrolepidota	0.50	80	0.40	
Lycengraulis poeyi	0.10	10	0.08	
Opisthonema libertate	0.10	30	0.08	
Total	122.70		99.83	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 374

DATE: 5/25/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1308  
Long W 8736

	start	stop	duration	Purpose code:	3
TIME:	12:02:00	12:30:00	28 (min)	Area code:	4
LOG:	6085.10	6086.60	1.50	GearCond. code:	1
FDEPTH:	14	18		Validity code:	3
BDEPTH:	14	18			

Towing dir: 313°

Wire out: 50 m

Speed: 32 kn\*10

Sorted: 18 Kg

Total catch: 72.60

CATCH/HOUR: 155.57



FDEPTH: 20 20 GearCond. code: 1  
 BDEPTH: 20 20 Validity code: 3  
 Towing dir: 270° Wire out: 150 m Speed: 30 kn\*10  
 Sorted: 10 Kg Total catch: 110.00 CATCH/HOUR: 220.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Bairdiella chrysoleuca	48.00	6102	21.81	
Xiphopenaeus riveti	40.00	8400	18.18	
Lycengraulis poeyi	20.00	146	9.09	
Bagre panamensis	14.00	340	6.36	
Anchoa starksi	14.00	1300	6.36	
Opisthopterus dovii	12.00	1240	5.45	
Anchoa ischana	10.00	1520	4.54	
Sphyraena ensis	10.00	120	4.54	
Lobotes pacificus	6.00	2	2.72	
Paralonchurus godeii	6.00	60	2.72	
Symphurus sp	6.00	280	2.72	
Opisthonema libertate	6.00	440	2.72	
Centropomus medius	5.00	2	2.27	
Polydactylus opercularis	4.00	20	1.81	
Polydactylus approximans	4.00	40	1.81	
Decapterus macrosoma	4.00	140	1.81	
Peprilus snyderi	2.00	40	0.90	
Cynoscion sp	2.00	300	0.90	
Selene peruvianus	2.00	60	0.90	
Chloroscombrus orqueta	2.00	180	0.90	
Penaeus stylirostris	1.00	20	0.45	
Penaeus occidentalis	1.00	20	0.45	
Parapsettus panamensis	1.00	20	0.45	
Total	220.00		99.86	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 377  
 PROJECT: LA

DATE: 5/25/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1300  
 start stop duration Long W 8752  
 TIME: 17:25:00 17:48:00 23 (min) Purpose code: 3  
 LOG: 6118.60 6119.80 1.20 Area code: 4  
 FDEPTH: 50 52 GearCond. code: 1  
 BDEPTH: 50 52 Validity code: 3  
 Towing dir: 107° Wire out: 200 m Speed: 35 kn\*10  
 Sorted: 12 Kg Total catch: 85.30 CATCH/HOUR: 222.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Cyclopsetta querna	56.34	532	25.31	
Xiphopenaeus riveti	31.30	10612	14.06	
Pomadasys panamensis	20.86	500	9.37	
Cynoscion phoxocephalus	17.73	86	7.96	
Trachypenaeus byrdi	11.47	793	5.15	
TORPEDINIDAE	10.43	83	4.68	
Symphurus leei	9.65	1137	4.33	
Trichiurus nitens	8.34	125	3.74	
Squilla sp	8.34	667	3.74	
Polydactylus approximans	8.34	292	3.74	
Bairdiella chrysoleuca	8.34	1043	3.74	
GOBIIDAE	8.34	1753	3.74	
Lepophidium prorates	6.26	83	2.81	
OPHICHTHIDAE	4.17	125	1.87	



Lycengraulis poeyi	4.17	125	1.87
Anchoa ischana	4.17	876	1.87
Eucinostomus argenteus	2.08	41	0.93
Anchoa lucida	2.08	166	0.93
Bagre panamensis	0.00	41	
Total	222.41		99.84

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 378

DATE: 5/26/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1228  
Long W 8807

	start	stop	duration	Purpose code:	3
TIME:	06:45:00	07:15:00	30 (min)	Area code:	4
LOG:	6212.10	6213.20	1.10	GearCond. code:	1
FDEPTH:	102	93		Validity code:	3
BDEPTH:	102	93			

Towing dir: 15°

Wire out: 400 m

Speed: 20 kn\*10

Sorted: 77 Kg

Total catch: 1800.00

CATCH/HOUR: 3600.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Prionotus ruscarius	1490.80	16054	41.41	164
Pleuroncodes planipes	1186.00	154180	32.94	165
Peprilus snyderi	323.40	14630	8.98	166
Cynoscion stolzmanni	211.00	12276	5.86	
Peprilus medius	168.80	3990	4.68	167
Pontinus dubius	79.60	4360	2.21	
Trichiurus nitens	37.40	2438	1.03	
Citharichthys sp	23.60	1968	0.65	
Loliopsis diomedea	23.40	1360	0.65	
GOBIIDAE	14.00	1266	0.38	
Diplectrum euryplectrum	14.00	234	0.38	
Synodus evermanni	14.00	328	0.38	
Mustelus dorsalis	6.80	2	0.18	
Engyophrys sancti-laurenti	4.60	188	0.12	
Porichthys margaritatus	2.40	94	0.06	
OPHICHTHIDAE	0.00	46		
Zalieutes elater	0.00	46		
Lepophidium pardale	0.00	46		
Symphurus atramentatus	0.00	140		
Total	3599.80		99.91	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 379

DATE: 5/26/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1221  
Long W 8751

	start	stop	duration	Purpose code:	3
TIME:	09:20:00	09:50:00	30 (min)	Area code:	4
LOG:	6231.00	6232.40	1.40	GearCond. code:	1
FDEPTH:	98	103		Validity code:	3
BDEPTH:	98	103			

Towing dir: 131°

Wire out: 400 m

Speed: 28 kn\*10

Sorted: 26 Kg

Total catch: 1248.00

CATCH/HOUR: 2496.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Cynoscion stolzmanni	1008.00	73920	40.38	168
Loliopsis diomedea	442.80	34920	17.74	169
Prionotus ruscarius	244.80	4616	9.80	
Peprilus snyderi	216.00	1598	8.65	170

Synodus evermanni	86.40	3888	3.46
Citharichthys sp	72.00	6336	2.88
Porichthys margaritatus	72.00	5184	2.88
GOBIIDAE	72.00	6480	2.88
Lepophidium pardale	64.80	3024	2.59
Peprilus medius	64.80	720	2.59
Squilla sp	57.60	9504	2.30
Pontinus dubius	36.00	3312	1.44
Diplectrum euryplectrum	21.60	576	0.86
Trichiurus nitens	21.60	864	0.86
Lutjanus Colorado	8.40	2	0.33
Solenocera mutator	7.20	3312	0.28
Lepidochelys olivacea	0.00		
Mursia gaudichaudii	0.00	288	
Octopus sp	0.00	72	
Engyophrys sancti-laurenti	0.00	288	
Zalieutes elater	0.00	288	
Symphurus sp	0.00	432	
Total	2496.00		99.92

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 380

DATE: 5/26/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1217  
Long W 8737

TIME:	start	stop	duration	Purpose code:	3
LOG:	11:45:00	12:15:00	30 (min)	Area code:	4
FDEPTH:	6248.60	6249.40	0.80	GearCond. code:	1
BDEPTH:	105	108		Validity code:	3

Towing dir: 215°

Wire out: 400 m

Speed: 25 kn\*10

Sorted: 21 Kg

Total catch: 4000.00

CATCH/HOUR: 8000.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	5000.00	1075000	62.50	171
Merluccius angustimanus	1115.40	124088	13.94	172
Solenocera florea	653.80	448506	8.17	
Peprilus snyderi	384.00	64896	4.80	
Prinotus quiescens	192.20	26880	2.40	
Bollmannia chlamydes	153.80	22272	1.92	
Loliopsis diomedae	115.40	35712	1.44	
Porichthys margaritatus	115.40	13056	1.44	
Lolliguncula panamensis	77.00	15744	0.96	
Squilla sp	77.00	18816	0.96	
Symphurus sp	38.40	6528	0.48	
Synodus evermanni	38.40	2304	0.48	
Pontinus dubius	38.40	2688	0.48	
Total	7999.20		99.97	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 381

DATE: 5/26/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1202  
Long W 8738

TIME:	start	stop	duration	Purpose code:	3
LOG:	14:08:00	14:41:00	33 (min)	Area code:	4
FDEPTH:	6265.00	6266.70	1.70	GearCond. code:	1
BDEPTH:	177	177		Validity code:	3

Towing dir: 130°

Wire out: 700 m

Speed: 32 kn\*10

Sorted: 21 Kg

Total catch: 2500.00

CATCH/HOUR: 4545.45



## ANNEX 3. RECORD OF FISHING STATIONS, EL SALVADOR

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 384

DATE: 5/28/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1234  
Long W 8818

	start	stop	duration		
TIME:	07:10:00	07:40:00	30 (min)	Purpose code:	3
LOG:	6436.10	6437.60	1.50	Area code:	6
FDEPTH:	293	296		GearCond. code:	1
BDEPTH:	293	296		Validity code:	3

Towing dir: 140°

Wire out: 1100 m

Speed: 30 kn\*10

Sorted: 30 Kg

Total catch: 166.10

CATCH/HOUR: 332.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	216.00	27476	65.02	176
Dosidiscus gigas	88.00	14	26.49	177
Plesionika sp	13.20		3.97	
Merluccius angustimanus	6.00	252	1.80	
MYCTOPHIDAE	3.60	1920	1.08	
Squilla sp	2.40	168	0.72	
Heterocarpus vicarius	1.80	240	0.54	
Sergesteidae	1.20	600	0.36	
Trichiurus nitens	0.00	12		
Total	332.20		99.98	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 385

DATE: 5/28/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1236  
Long W 8821

	start	stop	duration		
TIME:	08:43:00	09:13:00	30 (min)	Purpose code:	3
LOG:	6444.10	6445.80	1.70	Area code:	6
FDEPTH:	210	170		GearCond. code:	1
BDEPTH:	210	170		Validity code:	3

Towing dir: 280°

Wire out: 800 m

Speed: 32 kn\*10

Sorted: 46 Kg

Total catch: 721.60

CATCH/HOUR: 1443.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Argentina aliceae	837.00	39338	57.99	178
Pleuroncodes planipes	221.00	15248	15.31	179
Trichiurus nitens	133.20	5934	9.22	
Pontinus sierra	77.40	3006	5.36	
Heterocarpus vicarius	68.20	5828	4.72	
Centristhmus signifer	31.00	248	2.14	
Mursia gaudichaudii	24.80	650	1.71	
Anthias sp.	18.60	434	1.28	
Squilla sp	9.20	216	0.63	
Merluccius angustimanus	6.20	124	0.42	
Diplectrum maximum	6.20	186	0.42	
Solenocera agassizii	6.20	496	0.42	
Symphurus atramentatus	2.40	92	0.16	
Monolene maculipinna	1.80	278	0.12	
Coelorhynchus sp.	0.00	62		
Zalieutes elater	0.00	186		
MYCTOPHIDAE	0.00	434		

Physiculus rastrelliger 0.00 1270  
 Total 1443.20 99.90

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 386  
 PROJECT: LA

DATE: 5/28/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1241  
 start stop duration Long W 8820  
 TIME: 10:00:00 10:30:00 30 (min) Purpose code: 3  
 LOG: 6450.20 6451.60 1.40 Area code: 6  
 FDEPTH: 97 93 GearCond. code: 1  
 BDEPTH: 97 93 Validity code: 3  
 Towing dir: 110° Wire out: 450 m Speed: 28 kn\*10  
 Sorted: 33 Kg Total catch: 201.00 CATCH/HOUR: 402.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Loliopsis diomedea	276.00	34776	68.65	180
Peprilus medius	64.80	372	16.11	181
Decapterus macrosoma	24.00	372	5.97	
Citharichthys sp	18.00	336	4.47	
Porichthys margaritatus	8.40	792	2.08	
Trichiurus nitens	3.60	144	0.89	
Orthopristis sp	3.00	24	0.74	
Scorpaena afuerae	2.40	108	0.59	
Diplectrum sp	1.80	60	0.44	
Monolene maculipinna	0.00	12		
Engyophrys sancti-laurenti	0.00	12		
Synodus evermanni	0.00	60		
GOBIIDAE	0.00	132		
Zalieutes elater	0.00	132		
Prionotus stephanophrys	0.00	132		
Total	402.00		99.94	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 387  
 PROJECT: LA

DATE: 5/28/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1255  
 start stop duration Long W 8810  
 TIME: 12:29:00 12:59:00 30 (min) Purpose code: 3  
 LOG: 6468.70 6470.10 1.40 Area code: 6  
 FDEPTH: 60 59 GearCond. code: 1  
 BDEPTH: 60 59 Validity code: 3  
 Towing dir: 151° Wire out: 300 m Speed: 31 kn\*10  
 Sorted: 35 Kg Total catch: 176.80 CATCH/HOUR: 353.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Opisthonema libertate	70.00	7232	19.79	183
Chloroscombrus orqueta	70.00	2250	19.79	
Peprilus medius	40.00	370	11.31	
Selene peruvianus	30.00	1380	8.48	
Anchoa argentivittata	25.00	5850	7.07	182
Sphyræna ensis	18.00	440	5.09	
Cyclopsetta querna	13.00	140	3.67	
Bagre panamensis	12.00	30	3.39	
Squilla sp	10.00	1120	2.82	
Polydactylus approximans	10.00	440	2.82	
Larimus acclivis	10.00	460	2.82	
Diapterus aureolus	7.00	290	1.97	

Lycengraulis poeyi	7.00	120	1.97
Lolliguncula panamensis	4.00	70	1.13
Orthopristis sp	4.00	120	1.13
Isopisthus remifer	3.00	50	0.84
Synodus scituliceps	3.00	30	0.84
Prionotus ruscarius	3.00	30	0.84
Pomadasys panamensis	3.00	70	0.84
Penaeus brevisrostris	2.20	92	0.62
Porichthys margaritatus	2.00	180	0.56
Bollmannia chlamydes	2.00	210	0.56
Polydactylus opercularis	2.00	30	0.56
Pseudupeneus grandisquamis	0.60	30	0.16
Cyclopsetta sp.	0.40	50	0.11
Symphurus sp	0.40	30	0.11
Diplectrum maximum	0.20	20	0.05
Total	351.80		99.34

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 388

DATE: 5/28/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1302  
Long W 8814

	start	stop	duration	Purpose code:	3
TIME:	14:27:00	15:00:00	33 (min)	Area code:	6
LOG:	6482.20	6483.90	1.70	GearCond. code:	1
FDEPTH:	31	32		Validity code:	3
BDEPTH:	31	32			

Towing dir: 242°

Wire out: 200 m

Speed: 30 kn\*10

Sorted: 31 Kg

Total catch: 127.00

CATCH/HOUR: 230.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Sphyræna ensis	36.36	363	15.74	
Anchoa starksi	29.09	2618	12.59	184
Anchoa argentivittata	21.81	5236	9.44	185
Xiphopenaeus riveti	18.18	3127	7.87	
Opisthonema libertate	18.18	1454	7.87	186
Diapterus peruvianus	18.18	65	7.87	
Pomadasys panamensis	13.09	14	5.66	
Sphyrna lewini	10.90	14	4.72	
Peprilus medius	9.45	94	4.09	
Scomberomorus sierra	7.27	14	3.14	
Lycengraulis poeyi	7.27	123	3.14	
Bagre panamensis	7.27	43	3.14	
Chloroscombrus orqueta	5.81	196	2.51	
Opisthopterus dovii	5.09	530	2.20	187
Peprilus snyderi	5.09	58	2.20	
Lutjanus guttatus	4.54	7	1.96	
Squilla sp	3.63	901	1.57	
Polydactylus approximans	3.63	145	1.57	
Larimus acclivis	3.63	79	1.57	
Selar crumenophthalmus	0.72	7	0.31	
Trichiurus nitens	0.36	43	0.15	
Oligoplites saurus inornatus	0.21	14	0.09	
Bollmannia chlamydes	0.21	72	0.09	
Selene peruvianus	0.14	50	0.06	
Penaeus brevisrostris	0.14	14	0.06	
Penaeus stylirostris	0.14	7	0.06	
Cyclopsetta sp.	0.14	43	0.06	
Opistherus equitorialis	0.14	32	0.06	
Bairdiella chrysoleuca	0.07	43	0.03	
Symphurus sp	0.07	21	0.03	
Total	230.81		99.85	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 389

DATE: 5/28/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1258  
Long W 8827

	start	stop	duration	Purpose code:	3
TIME:	16:46:00	17:16:00	30 (min)	Area code:	6
LOG:	6495.00	6496.70	1.70	GearCond. code:	1
FDEPTH:	47	50		Validity code:	3
BDEPTH:	47	50			

Towing dir: 245°

Wire out: 250 m

Speed: 35 kn\*10

Sorted: 30 Kg

Total catch: 132.40

CATCH/HOUR: 264.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pepilus medius	36.00	368	13.59	188
Citharichthys sp	24.00	472	9.06	
Chloroscombrus orqueta	23.20	638	8.76	
Micropogonias altipinnis	21.00	8	7.93	
Selene peruvianus	18.40	816	6.94	
Bagre panamensis	16.00	40	6.04	
Sphyraena ensis	16.00	328	6.04	
Polydactylus approximans	16.00	440	6.04	
Anchoa sp	12.00	2760	4.53	
Xiphopenaeus riveti	11.20	2054	4.22	
Pomadasys panamensis	11.20	56	4.22	
Anchoa spinifer	10.40	296	3.92	
Diapterus peruvianus	9.60	40	3.62	
Cyclopsetta sp.	5.60	304	2.11	
Bairdiella sp	5.60	800	2.11	
Opisthopterus dovii	4.80	376	1.81	
Squilla sp	4.00	720	1.51	
Anchoa sp	3.60	240	1.35	
Cynoscion phoxocephalus	2.80	104	1.05	
Larimus effulgens	2.40	40	0.90	
Polydactylus opercularis	2.40	24	0.90	
Penaeus californiensis	1.60	32	0.60	
Larimus acclivis	1.20	16	0.45	
Prionotus ruscarius	1.20	16	0.45	
Lepophidium prorates	1.20	40	0.45	
Loliopsis diomedea	1.20	88	0.45	
Penaeus vannamei	1.20	24	0.45	
Penaeus stylirostris	0.60	6	0.22	
GOBIIDAE	0.40	88	0.15	
Opisthonema sp	0.00	8		
OPHICHTHIDAE	0.00	8		
Stellifer sp	0.00	8		
Selar crumenophthalmus	0.00	8		
Symphurus sp	0.00	16		
Eucinostomus argenteus	0.00	16		
Orthopristis sp	0.00	16		
Total	264.80		99.87	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 390

DATE: 5/28/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1251  
Long W 8831

	start	stop	duration	Purpose code:	3
TIME:	18:12:00	18:42:00	30 (min)	Area code:	6
LOG:	6503.70	6505.40	1.70	GearCond. code:	1
FDEPTH:	69	72			

BDEPTH: 69 72 Validity code: 3  
 Towing dir: 200° Wire out: 300 m Speed: 35 kn\*10  
 Sorted: 25 Kg Total catch: 176.30 CATCH/HOUR: 352.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Porichthys margaritatus	78.40	9800	22.23	
Bagre panamensis	30.80	112	8.73	
Prionotus ruscarius	28.00	5768	7.94	
Polydactylus opercularis	26.60	546	7.54	
Selene peruvianus	25.20	868	7.14	
Citharichthys sp	23.00	1120	6.52	
OPHICHTHIDAE	22.40	812	6.35	
Larimus sp	21.20	322	6.01	
Diplectrum sp	15.40	532	4.36	
Penaeus brevisrostris	14.00	910	3.97	189
Squilla sp	14.00	1232	3.97	
Synodus sp	11.20	728	3.17	
Solenocera mutator	8.40	6720	2.38	
Peprilus medius	7.00	70	1.98	
Cyclopsetta sp.	5.60	224	1.58	
Orthopristis sp	5.60	504	1.58	
Anchoa sp	5.60	896	1.58	
Loliopsis diomedea	5.60	672	1.58	
GOBIIDAE	5.60	1456	1.58	
Lepidochelys olivacea	0.00	4		
CONGRIDAE	0.00	8		
Opisthopterus dovii	0.00	14		
Epinephelus niveatus	0.00	28		
Diapterus aureolus	0.00	28		
Chloroscombrus orqueta	0.00	56		
Symphurus atramentatus	0.00	56		
Total	353.60		100.19	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 391  
 PROJECT: LA

DATE: 5/29/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1227  
 start stop duration Long W 8853  
 TIME: 05:56:00 06:26:00 30 (min) Purpose code: 3  
 LOG: 6590.20 6592.10 1.90 Area code: 6  
 FDEPTH: 249 246 GearCond. code: 1  
 BDEPTH: 249 246 Validity code: 3  
 Towing dir: 115° Wire out: 900 m Speed: 35 kn\*10

Sorted: 17 Kg Total catch: 7999.80 CATCH/HOUR: 15999.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	14760.00	1305852	92.25	190
Heterocarpus vicarius	571.40	80000	3.57	191
Pontinus dubius	190.40	12380	1.19	
Squilla sp	142.80	4762	0.89	
Merluccius angustimanus	142.80	7618	0.89	
Lophiodes caularis	95.20	1904	0.59	
Physiculus talarae	95.20	14286	0.59	
MYCTOPHIDAE	0.00	952		
Monolene maculipinna	0.00	1904		
Total	15997.80		99.97	



R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 392

DATE: 5/29/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1231  
Long W 8853

	start	stop	duration		
TIME:	08:10:00	08:40:00	30 (min)	Purpose code:	3
LOG:	6596.60	6598.20	1.60	Area code:	6
FDEPTH:	142	147		GearCond. code:	1
BDEPTH:	142	147		Validity code:	3

Towing dir: 275°

Wire out: 550 m

Speed: 32 kn\*10

Sorted: 26 Kg

Total catch: 1205.20

CATCH/HOUR: 2410.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Argentina aliciae	1656.00	108276	68.70	192
Diplectrum euryplectrum	510.60	20934	21.18	193
Pleuroncodes planipes	142.60	15180	5.91	194
Trichiurus nitens	92.00	7360	3.81	
Cyclopsetta sp.	9.20	460	0.38	
Cynoscion stolzmanni	0.00	92		
Pontinus dubius	0.00	92		
Mursia gaudichaudii	0.00	184		
CALLIONYMIDAE	0.00	368		
Cyclopsetta querna	0.00	460		
Zalieutes elater	0.00	644		
Total	2410.40		99.98	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 393

DATE: 5/29/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1242  
Long W 8849

	start	stop	duration		
TIME:	10:15:00	10:45:00	30 (min)	Purpose code:	3
LOG:	6610.30	6611.60	1.30	Area code:	6
FDEPTH:	97	90		GearCond. code:	1
BDEPTH:	97	90		Validity code:	3

Towing dir: 21°

Wire out: 400 m

Speed: 26 kn\*10

Sorted: 60 Kg

Total catch: 124.70

CATCH/HOUR: 249.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Peprilus snyderi	108.00	928	43.30	195
Peprilus medius	80.00	1006	32.07	196
Loliopsis diomedea	20.00	1856	8.01	
Lutjanus peru	15.60	52	6.25	
Mustelus dorsalis	7.00	2	2.80	
Decapterus macrosoma	4.00	48	1.60	
Cyclopsetta querna	2.40	240	0.96	
Epinephelus niveatus	2.40	8	0.96	
Zalieutes elater	2.00	256	0.80	
Cynoscion stolzmanni	1.20	64	0.48	
Synodus evermanni	0.80	20	0.32	
Diplectrum sp	0.80	16	0.32	
Orthopristis sp	0.80	8	0.32	
Engyophrys sancti-laurenti	0.40	36	0.16	
Sphoeroides sp	0.00	4		
Prionotus stephanophrys	0.00	4		
Porichthys margaritatus	0.00	4		
Lophiodes caularis	0.00	8		

Euphylax sp.	0.00	8	
Lepophidium pardale	0.00	8	
CALLIONYMIDAE	0.00	12	
Mursia gaudichaudii	0.00	12	
Monolene maculipinna	0.00	12	
Total	245.40		98.35

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 394

DATE: 5/29/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1254  
Long W 8844

	start	stop	duration	Purpose code:	3
TIME:	12:06:00	12:35:00	29 (min)	Area code:	6
LOG:	6622.10	6623.50	1.40	GearCond. code:	1
FDEPTH:	66	63		Validity code:	3
BDEPTH:	66	63			

Towing dir: 62°

Wire out: 300 m

Speed: 28 kn\*10

Sorted: 33 Kg

Total catch: 33.50

CATCH/HOUR: 69.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pomadasys panamensis	28.96	130	41.78	197
Anchoa argentivittata	9.31	715	13.43	198
Diapterus aureolus	6.20	182	8.94	
Peprilus medius	6.20	70	8.94	
Carangoides sp	4.13	2	5.95	
Cyclopsetta querna	3.93	41	5.67	
Selene peruvianus	3.10	86	4.47	199
Chloroscombrus orqueta	2.06	188	2.97	200
Loliopsis diomedea	1.86	591	2.68	
Larimus acclivis	1.44	68	2.07	
Peprilus snyderi	1.44	8	2.07	
Polydactylus approximans	0.20	8	0.28	
Orthopristis sp	0.10	4	0.14	
Lolliguncula panamensis	0.08	6	0.11	
Penaeus brevirostris	0.06	16	0.08	
Octopus sp	0.04	2	0.05	
Squilla sp	0.04	33	0.05	
Sicyonia sp	0.02	16	0.02	
Cyclopsetta sp.	0.02	8	0.02	
Bollmannia chlamydes	0.02	10	0.02	
Synodus scituliceps	0.02	2	0.02	
Porichthys margaritatus	0.02	16	0.02	
Total	69.25		99.78	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 395

DATE: 5/29/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1306  
Long W 8839

	start	stop	duration	Purpose code:	3
TIME:	14:24:00	14:54:00	30 (min)	Area code:	6
LOG:	6639.00	6640.70	1.70	GearCond. code:	1
FDEPTH:	24	28		Validity code:	3
BDEPTH:	24	28			

Towing dir: 254°

Wire out: 150 m

Speed: 35 kn\*10

Sorted: 31 Kg

Total catch: 249.10

CATCH/HOUR: 498.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Sphyraena ensis	144.00	1104	28.90	203
Chloroscombrus orqueta	54.40	1488	10.91	
Anchoa argentivittata	44.80	10136	8.99	201
Larimus acclivis	38.40	1344	7.70	
Xiphopenaeus riveti	27.20	4624	5.45	
Sphyrna lewini	24.00	32	4.81	
Anchoa starksi	22.40	3062	4.49	202
Opisthopterus dovii	20.80	2960	4.17	
Bairdiella chrysoleuca	19.20	1024	3.85	
Pomadasy panamensis	16.00	128	3.21	
Opisthonema libertate	12.80	1536	2.56	
Polydactylus opercularis	11.20	96	2.24	
Isopisthus remifer	9.60	2032	1.92	
Diapterus peruvianus	9.60	32	1.92	
Polydactylus approximans	8.00	416	1.60	
Peprilus medius	6.40	64	1.28	
Selene peruvianus	6.40	160	1.28	
Caranx hippos	4.80	16	0.96	
Lycengraulis poeyi	4.80	96	0.96	
Conodon nobilis	3.20	16	0.64	
Opistherus equitorialis	3.20	144	0.64	
Nebris occidentalis	1.60	32	0.32	
Synodus scituliceps	1.60	16	0.32	
Xenichthys xanti	1.60	16	0.32	
Lolliguncula panamensis	0.80	144	0.16	
Cetengraulis mysticetus	0.60	16	0.12	
Cyclopsetta sp.	0.40	48	0.08	
Squilla sp	0.40	112	0.08	
Total	498.20		99.88	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 396

DATE: 5/29/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1303  
Long W 8848

	start	stop	duration	Purpose code:	1
TIME:	15:51:00	16:11:00	20 (min)	Area code:	6
LOG:	6648.10	6649.30	1.20	GearCond. code:	1
FDEPTH:	49	44		Validity code:	3
BDEPTH:	49	44			

Towing dir: 70°

Wire out: 250 m

Speed: 35 kn\*10

Sorted: 28 Kg

Total catch: 302.50

CATCH/HOUR: 907.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Opisthonema libertate	270.00	381	29.75	204
Chloroscombrus orqueta	192.00	4245	21.15	205
Bagre panamensis	60.00	1380	6.61	
Selene peruvianus	60.00	3825	6.61	206
Larimus argenteus	45.00	370	4.95	
Micropogonias altipinnis	43.50	18	4.79	
Isopisthus remifer	39.00	4950	4.29	
Anchoa lucida	36.00	4830	3.96	
Peprilus medius	30.00	270	3.30	
Trichiurus nitens	24.00	1650	2.64	
Sphyraena ensis	24.00	270	2.64	
Centropomus medius	19.20	3	2.11	
Polydactylus	18.00	510	1.98	
Bairdiella chrysoleuca	15.00	300	1.65	

Penaeus californiensis	6.00	150	0.66
Opistherus equitorialis	6.00	240	0.66
Selar crumenophthalmus	6.00	30	0.66
Penaeus stylirostris	3.00	60	0.33
Polydactylus opercularis	3.00	30	0.33
Pomadasys panamensis	3.00	60	0.33
Conodon nobilis	3.00	30	0.33
Xenichthys xanti	1.50	30	0.16
Hemicaranx leucurus	0.30	30	0.03
Total	907.50		99.92

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 397

DATE: 5/29/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1310  
Long W 8853

	start	stop	duration	Purpose code:	3
TIME:	17:32:00	18:02:00	30 (min)	Area code:	6
LOG:	6661.20	6662.80	1.60	GearCond. code:	1
FDEPTH:	30	40		Validity code:	3
BDEPTH:	30	40			

Towing dir: 200°

Wire out: 200 m

Speed: 32 kn\*10

Sorted: 22 Kg

Total catch: 80.10

CATCH/HOUR: 160.20

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP. NO.
Xiphopenaeus riveti	28.00	6346	17.47
Anchoa sp	18.20	3670	11.36
Bairdiella chrysoleuca	14.00	1666	8.73
Larimus effulgens	12.20	238	7.61
Bagre sp	11.20	388	6.99
Peprilus medius	10.40	104	6.49
Polydactylus approximans	9.80	392	6.11
Opisthopterus dovii	8.20		5.11
Selene peruvianus	5.40	262	3.37
Lutjanus colorado	5.20	4	3.24
Sphyrna lewini	5.20	6	3.24
Lepophidium prorates	4.80	154	2.99
Penaeus stylirostris	4.20	34	2.62
Pomadasys panamensis	3.40	14	2.12
Sphoeroides sp	2.80		1.74
Squilla sp	2.80		1.74
Symphurus sp	2.80	266	1.74
Anchoa spinifer	2.80	154	1.74
Nebris occidentalis	2.00	70	1.24
Stellifer sp	2.00	1792	1.24
Opisthonema libertate	2.00	28	1.24
Isopisthus remifer	1.40	14	0.87
Prionotus ruscarius	1.40	14	0.87
Anchovia macrolepidota	0.00	14	
Cynoscion stolzmanni	0.00	14	
Pseudupeneus grandisquamis	0.00	14	
OPHICHTHIDAE	0.00	28	
Cyclopsetta sp.	0.00	42	
Cyclopsetta querna	0.00	42	
Polydactylus opercularis	0.00	56	
Loliopsis diomedae	0.00	84	
Chloroscombrus orqueta	0.00	84	
Trichiurus nitens	0.00	98	
GOBIIDAE	0.00	98	
Porichthys margaritatus	0.00	98	
Sicyonia disdorsalis	0.00	112	
Total	160.20		99.87

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 398

DATE: 5/30/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1242  
Long W 8917

	start	stop	duration	Purpose code:	
TIME:	05:12:00	05:43:00	31 (min)		3
LOG:	6752.00	6753.30	1.30	Area code:	6
FDEPTH:	146	142		GearCond. code:	1
BDEPTH:	146	142		Validity code:	3

Towing dir: 90°

Wire out: 700 m

Speed: 28 kn\*10

Sorted: 7 Kg

Total catch: 229.10

CATCH/HOUR: 443.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Diplectrum macropoma	170.90	16234	38.54	
Argentina aliciae	137.99	7949	31.12	208
Pleuroncodes planipes	53.99	4739	12.17	209
Cyclopsetta sp.	26.90	1552	6.06	
Nanosquilla decemspinosa	20.90	538	4.71	
Lepophidium pardale	8.90	656	2.00	
Cynoscion stolzmanni	8.90	418	2.00	
Monolene maculipinna	5.99	1014	1.35	
Pontinus sierra	5.99	716	1.35	
Maiopsis panamensis	2.90	1	0.65	
Pontinus dubius	0.00	59		
Zalieutes elater	0.00	119		
Peprilus snyderi	0.00	119		
Trichiurus nitens	0.00	238		
Total	443.36		99.95	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 399

DATE: 5/30/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1249  
Long W 8927

	start	stop	duration	Purpose code:	
TIME:	08:07:00	08:37:00	30 (min)		3
LOG:	6773.80	6775.20	1.40	Area code:	6
FDEPTH:	247	260		GearCond. code:	1
BDEPTH:	247	260		Validity code:	3

Towing dir: 145°

Wire out: 900 m

Speed: 28 kn\*10

Sorted: 17 Kg

Total catch: 4000.00

CATCH/HOUR: 8000.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	7857.20	720244	98.21	210
Heterocarpus vicarius	95.20	9524	1.19	
Nanosquilla decemspinosa	47.60	1904	0.59	
Synchiropus talarae	0.00	1904		
Monolene maculipinna	0.00	1904		
Total	8000.00		99.99	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 400

DATE: 5/30/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1253  
Long W 8916

	start	stop	duration	Purpose code:	
TIME:	10:30:00	11:00:00	30 (min)		3
LOG:	6790.20	6792.20	2.00	Area code:	6
FDEPTH:	101	92		GearCond. code:	1

BDEPTH: 101 92 Validity code: 3  
 Towing dir: 22° Wire out: 450 m Speed: 40 kn\*10  
 Sorted: 16 Kg Total catch: 214.20 CATCH/HOUR: 428.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Peprilus snyderi	166.40	1996	38.84	211
Loliopsis diomedea	71.40	4614	16.66	212
Prionotus ruscarius	57.20	1534	13.35	
Peprilus medius	31.20	520	7.28	213
Cyclopsetta querna	26.00	2756	6.06	
Cynoscion sp	23.40	572	5.46	
Synodus evermanni	15.60	624	3.64	
Lutjanus peru	14.00	8	3.26	
Porichthys margaritatus	13.00	1404	3.03	
Engyophrys sancti-laurenti	3.80	234	0.88	
Diplectrum sp	3.80	130	0.88	
Zalieutes elater	2.60	286	0.60	
GOBIIDAE	0.00	26		
BREGMACEROTIDAE	0.00	26		
Mursia gaudichaudii	0.00	26		
Penaeus brevisrostris	0.00	26		
OPHICHTHIDAE	0.00	26		
Decapterus macarellus	0.00	26		
Pontinus sierra	0.00	52		
Lepophidium pardale	0.00	26		
Lepidochelys olivacea	0.00	6		
Trichiurus nitens	0.00	78		
Total	428.40		99.94	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 401  
 PROJECT: LA

DATE: 5/30/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1307  
 start stop duration Long W 8910  
 TIME: 12:45:00 13:16:00 31 (min) Purpose code: 3  
 LOG: 6807.30 6808.80 1.50 Area code: 6  
 FDEPTH: 64 60 GearCond. code: 1  
 BDEPTH: 64 60 Validity code: 3  
 Towing dir: 25° Wire out: 300 m Speed: 30 kn\*10  
 Sorted: 34 Kg Total catch: 271.60 CATCH/HOUR: 525.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Anchoa argentivittata	188.90	112161	35.93	214
Chloroscombrus orqueta	58.83	1083	11.19	215
Selene peruvianus	44.90	727	8.54	216
Sphyraena ensis	34.06	557	6.47	217
Peprilus sp	29.41	201	5.59	
Peprilus medius	23.22	247	4.41	
Diapterus aureolus	23.22	1114	4.41	
Pomadasys panamensis	17.03	61	3.23	
Diapterus peruvianus	15.48	61	2.94	
Opisthonema libertate	12.38	108	2.35	
Trichiurus nitens	10.83	309	2.06	
Orthopristis sp	10.83	123	2.06	
Synodus evermanni	9.29	325	1.76	
Pseudupeneus grandisquamis	7.74	278	1.47	
Squilla sp	7.74	959	1.47	
Porichthys margaritatus	6.19	201	1.17	

Hemicaranx leucurus	6.19	15	1.17
Larimus acclivis	6.19	46	1.17
Diplectrum pacificum	4.64	46	0.88
Selar crumenophthalmus	3.09	15	0.58
Symphurus sp	0.77	15	0.14
Loliopsis diomedea	0.77	185	0.14
Penaeus stylirostris	0.77	30	0.14
Penaeus californiensis	0.77	108	0.14
Isopisthus remifer	0.77	15	0.14
Lutjanus guttatus	0.77	61	0.14
Epinephelus niveatus	0.46	15	0.08
Zalieutes elater	0.30	15	0.05
Total	525.54		99.82

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 402

DATE: 5/30/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1318  
Long W 8906

	start	stop	duration	Purpose code:	3
TIME:	15:15:00	15:45:00	30 (min)	Area code:	6
LOG:	6826.20	6827.60	1.40	GearCond. code:	3
FDEPTH:	26	30		Validity code:	3
BDEPTH:	26	30			

Towing dir: 260°

Wire out: 300 m

Speed: 30 kn\*10

Sorted: Kg

Total catch:

CATCH/HOUR:

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
NO CATCH	0.00		
Total			

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 403

DATE: 5/30/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1318  
Long W 8907

	start	stop	duration	Purpose code:	3
TIME:	16:03:00	16:33:00	30 (min)	Area code:	6
LOG:	6828.40	6830.00	1.60	GearCond. code:	1
FDEPTH:	30	30		Validity code:	3
BDEPTH:	30	30			

Towing dir: 310°

Wire out: 150 m

Speed: 30 kn\*10

Sorted: 25 Kg

Total catch: 153.80

CATCH/HOUR: 307.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Sphyrna ensis	45.60 624	14.82	
Anchoa argentivittata	30.00 7320	9.75	
Peprilus medius	27.60 300	8.97	
Opisthonema libertate	26.40 1080	8.58	
Opisthopterus dovii	24.00 9840	7.80	
Bagre pinnimaculatus	12.00 36	3.90	
Anchoa sp	12.00 1248	3.90	
Bairdiella chrysouleuca	12.00 984	3.90	
Chloroscombrus orqueta	10.80 300	3.51	
Lutjanus Colorado	10.00 2	3.25	
Sphyrna lewini	9.60 12	3.12	
Penaeus vannamei	9.60 144	3.12	
Polydactylus approximans	8.40 276	2.73	
Lycengraulis poeyi	7.20 444	2.34	
Diapterus peruvianus	6.00 24	1.95	

Opistherus equitorialis	6.00	324	1.95
Hemicaranx leucurus	4.80	60	1.56
Anchoa starksi	4.80	1008	1.56
Xiphopenaeus riveti	4.80	588	1.56
Trichiurus nitens	4.80	156	1.56
Bagre panamensis	4.20	144	1.36
Lolliguncula panamensis	4.20	456	1.36
Haemulopsis leuciscus	3.60	12	1.17
Isopisthus remifer	3.60	456	1.17
Scomberomorus sierra	3.60	24	1.17
Cynoscion reticulatus	2.40	72	0.78
Polydactylus opercularis	2.40	60	0.78
Larimus acclivis	2.40	36	0.78
Selene peruvianus	1.20	252	0.39
Synodus evermanni	1.20	12	0.39
Penaeus stylirostris	1.20	24	0.39
Symphurus sp	0.60	12	0.19
Squilla sp	0.60	120	0.19
Total	307.60		99.95

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 404

DATE: 5/30/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1323  
Long W 8919

TIME:	start	stop	duration	Purpose code:	3
LOG:	17:40:00	18:10:00	30 (min)	Area code:	6
FDEPTH:	6839.40	6841.10	1.70	GearCond. code:	1
BDEPTH:	34	42		Validity code:	3

Towing dir: 200°

Wire out: 200 m

Speed: 30 kn\*10

Sorted: 12 Kg

Total catch: 112.30

CATCH/HOUR: 224.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Polydactylus approximans	26.40	864	11.75	
Bairdiella chrysoleuca	24.00	1320	10.68	
Bagre panamensis	21.00	186	9.34	
Opisthopterus sp	19.20	2904	8.54	
Lutjanus Colorado	18.00	4	8.01	
Larimus effulgens	15.60	264	6.94	
Sphyræna ensis	15.60	216	6.94	
Anchoa sp	12.00	1248	5.34	
Peprilus medius	12.00	120	5.34	
Xiphopenaeus riveti	10.80	1536	4.80	
Cyclopsetta querna	9.60	384	4.27	
Isopisthus remifer	7.20	696	3.20	
Cyclopsetta sp.	7.20	432	3.20	
Opisthonema libertate	5.40	54	2.40	
Cynoscion reticulatus	4.80	24	2.13	
Squilla sp	3.60	192	1.60	
Polydactylus opercularis	3.60	48	1.60	
Penaeus vannamei	3.00	48	1.33	
Anchoa starksi	2.40	144	1.06	
Penaeus californiensis	0.80	18	0.35	
Xenichthys xanti	0.00	24		
Anchoa spinifer	0.00	24		
Anchovia macrolepidota	0.00	24		
Lutjanus guttatus	0.00	24		
Symphurus sp	0.00	192		
Lepophidium prorates	0.00	24		
Loliopsis diomedea	0.00	48		



GOBIIDAE	0.00	72
Sicyonia sp	0.00	192
Selene peruvianus	0.00	168
Total	222.20	98.82

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 405  
PROJECT: LA

DATE: 5/30/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1250  
Long W 8931

TIME:	start	stop	duration	Purpose code:	3
LOG:	22:30:00	23:00:00	30 (min)	Area code:	6
FDEPTH:	6872.70	6873.90	1.20	GearCond. code:	1
BDEPTH:	355	376		Validity code:	3
	355	376			

Towing dir: 315° Wire out: 1200 m Speed: 30 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
NO CATCH	0.00		
Total			

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 406  
PROJECT: LA

DATE: 5/31/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1256  
Long W 8948

TIME:	start	stop	duration	Purpose code:	3
LOG:	05:31:00	06:01:00	30 (min)	Area code:	6
FDEPTH:	6908.50	6909.50	1.00	GearCond. code:	1
BDEPTH:	249	285		Validity code:	3
	249	285			

Towing dir: 285° Wire out: 900 m Speed: 23 kn\*10

Sorted: 6 Kg Total catch: 286.00 CATCH/HOUR: 572.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Pleuroncodes planipes	312.00	24960	54.54
Nanosquilla decemspinosa	234.00	11504	40.90
Cynoscion stolzmanni	13.00	130	2.27
MYCTOPHIDAE	10.40		1.81
Merluccius angustimanus	2.60	52	0.45
PANDALIDAE	0.00	832	
BREGMACEROTIDAE	0.00	1560	
Total	572.00		99.97

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 407  
PROJECT: LA

DATE: 5/31/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1300  
Long W 8945

TIME:	start	stop	duration	Purpose code:	3
LOG:	07:26:00	07:56:00	30 (min)	Area code:	6
FDEPTH:	6920.20	6921.30	1.10	GearCond. code:	1
BDEPTH:	162	158		Validity code:	3
	162	158			

Towing dir: 205° Wire out: 650 m Speed: 22 kn\*10

Sorted: 14 Kg Total catch: 541.20 CATCH/HOUR: 1082.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Diplectrum macropoma	580.00	51948	53.58	219
Pleuroncodes planipes	348.00	29580	32.15	220
Nanosquilla decemspinosa	94.40	720	8.72	
Cyclopsetta querna	40.00	320	3.69	
Pontinus sierra	12.00	800	1.10	
Argentina aliciae	8.00	480	0.73	
Peprilus snyderi	0.00	80		
Synchiropus talarae	0.00	160		
Cynoscion stolzmanni	0.00	160		
Loliopsis diomedea	0.00	560		
Total	1082.40		99.97	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 408  
PROJECT: LA

DATE: 5/31/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1308  
start stop duration Long W 8941  
TIME: 09:37:00 10:07:00 30 (min) Purpose code: 3  
LOG: 6934.90 6936.60 1.70 Area code: 6  
FDEPTH: 108 100 GearCond. code: 1  
BDEPTH: 108 100 Validity code: 3  
Towing dir: 20° Wire out: 400 m Speed: 34 kn\*10  
Sorted: 19 Kg Total catch: 94.10 CATCH/HOUR: 188.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Peprilus snyderi	89.40	624	47.50	221
Loliopsis diomedea	26.40	1776	14.02	222
Cyclopsetta sp.	14.40	1416	7.65	
GOBIIDAE	12.00	264	6.37	
Porichthys margaritatus	7.20	912	3.82	
Cynoscion stolzmanni	7.20	288	3.82	
Nanosquilla decemspinosa	4.80	240	2.55	
Synodus evermanni	4.80	192	2.55	
Zalieutes elater	4.80	360	2.55	
Prionotus ruscarius	4.80	168	2.55	
Mursia gaudichaudii	4.80	72	2.55	
Pontinus sierra	3.60	216	1.91	
Sarda orientalis	3.60	2	1.91	
Lutjanus peru	0.40	2	0.21	
Symphurus sp	0.00	24		
Diplectrum sp	0.00	48		
CALLIONYMIDAE	0.00	120		
Engyophrys sancti-laurenti	0.00	120		
Total	188.20		99.96	

R/V DR. FRIDTJOF NANSEN CATCH DATA PROJECT STATION: 409  
PROJECT: LA

DATE: 5/31/87 GEAR TYPE: BT No: 1 POSITION: Lat N 1317  
start stop duration Long W 8937  
TIME: 11:09:00 11:39:00 30 (min) Purpose code: 3  
LOG: 6944.30 6946.00 1.70 Area code: 6  
FDEPTH: 72 68 GearCond. code: 1  
BDEPTH: 72 68 Validity code: 3  
Towing dir: 20° Wire out: 300 m Speed: 34 kn\*10  
Sorted: 35 Kg Total catch: 457.77 CATCH/HOUR: 915.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Anchoa argentivittata	842.40	325472	92.01	223
Peprilus snyderi	20.80	156	2.27	
Prionotus ruscarius	13.00	52	1.41	
Carangoides sp	10.40	26	1.13	
Loliopsis diomedea	6.00	962	0.65	
Lutjanus peru	4.50	14	0.49	
Cyclopsetta sp.	2.60	182	0.28	
Diplectrum pacificum	2.60	78	0.28	
Diapterus aureolus	2.60	234	0.28	
Penaeus vannamei	2.60	104	0.28	
Opisthonema libertate	2.60	494	0.28	
Porichthys margaritatus	2.60	234	0.28	
Larimus acclivis	1.20	52	0.13	
Synodus evermanni	1.20	104	0.13	
Bollmannia chlamydes	0.60	26	0.06	
Polydactylus opercularis	0.20	78	0.02	
Solenocera agassizii	0.20	78	0.02	
Total	916.10		100.00	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 410

DATE: 5/31/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1328  
Long W 8936

	start	stop	duration	Purpose code:	
TIME:	13:30:00	14:00:00	30 (min)		3
LOG:	6956.50	6957.90	1.40	Area code:	6
FDEPTH:	31	30		GearCond. code:	1
BDEPTH:	31	30		Validity code:	3

Towing dir: 275°

Wire out: 200 m

Speed: 30 kn\*10

Sorted: 24 Kg

Total catch: 118.24

CATCH/HOUR: 236.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Polydactylus approximans	40.00	1032	16.91	
Anchoa argentivittata	28.80	11000	12.17	224
Opisthopterus dovii	22.40	10584	9.47	
Micropogonias altipinnis	18.00	8	7.61	
Sphyrna ensis	12.00	216	5.07	
Oligoplites saurus inornatus	12.00	176	5.07	
Larimus acclivis	11.20	240	4.73	
Peprilus medius	10.40	128	4.39	
Polydactylus opercularis	9.60	96	4.05	
Lycengraulis poeyi	8.00	408	3.38	
Penaeus vannamei	7.00	184	2.96	225
Bagre panamensis	6.40	48	2.70	
Lutjanus argentiventris	6.20	4	2.62	
Cyclopsetta querna	4.40	240	1.86	
Lolliguncula panamensis	4.00	440	1.69	
Pomadasys panamensis	4.00	280	1.69	
Hemicaranx leucurus	4.00	32	1.69	
Isopisthus remifer	4.00	168	1.69	
Cynoscion phoxocephalus	4.00	48	1.69	
Lepophidium pardale	2.40	96	1.01	
Cynoscion reticulatus	2.40	8	1.01	
Xiphopenaeus riveti	1.60	96	0.67	
Cyclopsetta sp.	1.60	112	0.67	
Trichiurus nitens	1.60	120	0.67	
Orthopristis sp	1.60	16	0.67	



Towing dir: 120°

Wire out: 900 m

Speed: 30 kn\*10

Sorted: 15 Kg

Total catch: 698.90

CATCH/HOUR: 1397.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	1344.00	114240	96.15	228
Nanosquilla decemspinosa	49.00	3264	3.50	
Heterocarpus vicarius	4.80	480	0.34	
Cynoscion stolzmanni	0.00	96		
BREGMACEROTIDAE	0.00	288		
Merluccius angustimanus	0.00	288		
Monolene maculipinna	0.00	288		
MYCTOPHIDAE	0.00	960		
Total	1397.80		99.99	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 413

DATE: 6/1/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1309  
Long W 9012

	start	stop	duration	Purpose code:	
TIME:	05:37:00	06:07:00	30 (min)		3
LOG:	7053.30	7054.90	1.60	Area code:	6
FDEPTH:	208	207		GearCond. code:	1
BDEPTH:	208	207		Validity code:	3

Towing dir: 130°

Wire out: 750 m

Speed: 32 kn\*10

Sorted: 19 Kg

Total catch: 1153.00

CATCH/HOUR: 2306.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	2040.00	186738	88.46	229
Nanosquilla decemspinosa	62.40	4200	2.70	
Monolene maculipinna	60.00	10080	2.60	
Zalieutes elater	48.00	5880	2.08	
Argentina aliciae	24.00	1800	1.04	
Pontinus sierra	24.00	1920	1.04	
Mursia gaudichaudii	24.00	360	1.04	
Cynoscion stolzmanni	18.00	1080	0.78	
Physiculus talarae	6.00	1080	0.26	
Solenocera agassizii	0.00	120		
Lophiodes caularis	0.00	600		
Peprilus snyderi	0.00	120		
MYCTOPHIDAE	0.00	360		
Total	2306.40		100.00	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 414

DATE: 6/1/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1317  
Long W 9011

	start	stop	duration	Purpose code:	
TIME:	07:29:00	07:59:00	30 (min)		3
LOG:	7064.40	7065.90	1.50	Area code:	6
FDEPTH:	121	122		GearCond. code:	1
BDEPTH:	121	122		Validity code:	3

Towing dir: 120°

Wire out: 450 m

Speed: 30 kn\*10

Sorted: 25 Kg

Total catch: 125.70

CATCH/HOUR: 251.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Pleuroncodes planipes	87.00	6960	34.60	230

Loliopsis diomedea	75.00	6750	29.83	231
Nanosquilla decemspinosa	63.00	2604	25.05	
Monolene maculipinna	15.00	2250	5.96	
Zalieutes elater	5.00	570	1.98	
Cyclopsetta querna	4.00	270	1.59	
Prionotus ruscarius	1.50	20	0.59	
Pontinus sierra	1.00	70	0.39	
Lepidochelys olivacea	0.00	4		
Cynoscion stolzmanni	0.00	10		
Engyophrys sancti-laurenti	0.00	10		
Synodus evermanni	0.00	10		
Mursia gaudichaudii	0.00	10		
Lepophidium pardale	0.00	10		
Peprilus snyderi	0.00	40		
Total	251.50		99.99	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 415

DATE: 6/1/87

GEAR TYPE: BT No: 1

POSITION: Lat N 1330  
Long W 9004

	start	stop	duration	Purpose code:	3
TIME:	09:55:00	10:25:00	30 (min)	Area code:	6
LOG:	7081.70	7083.20	1.50	GearCond. code:	1
FDEPTH:	66	59		Validity code:	3
BDEPTH:	66	59			

Towing dir: 12°

Wire out: 350 m

Speed: 30 kn\*10

Sorted: 29 Kg

Total catch: 163.30

CATCH/HOUR: 326.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Nasolamia velox	84.00	40	25.71	
Hemicaranx leucurus	82.40	312	25.22	
Selene brevoorti	56.80	56	17.39	
Pomadasyx panamensis	27.20	128	8.32	
Pseudobalistes naufragium	20.00	8	6.12	
Diapterus aureolus	12.40	1650	3.79	232
Sphyrna lewini	5.40	2	1.65	
Lutjanus colorado	4.60	2	1.40	
Loliopsis diomedea	4.20	888	1.28	
Lutjanus peru	4.00	24	1.22	
Selene peruvianus	4.00	48	1.22	
Sphoeroides sp	3.20	504	0.97	
Cyclopsetta querna	3.20	32	0.97	
Synodus evermanni	3.20	40	0.97	
Caranx caballus	2.40	8	0.73	
Callinectes sp	2.00	40	0.61	
MURAENIDAE	1.60	8	0.48	
Chloroscombrus orqueta	1.60	32	0.48	
Anchoa argentivittata	1.20	32	0.36	
Orthopristis sp	1.20	8	0.36	
Paralabrax callaensis	1.20	8	0.36	
Diplectrum macropoma	0.80	88	0.24	
Scorpaena sp	0.00	8		
Prionotus xenisma	0.00	8		
Cyclopsetta sp.	0.00	32		
Total	326.60		99.85	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

PROJECT STATION: 416

DATE: 6/1/87  
 start stop duration  
 TIME: 11:30:00 12:00:00 30 (min) Purpose code: 3  
 LOG: 7092.20 7093.60 1.40 Area code: 6  
 FDEPTH: 25 25 GearCond. code: 1  
 BDEPTH: 25 25 Validity code: 3  
 Towing dir: 90° Wire out: 150 m Speed: 30 kn\*10  
 Sorted: 32 Kg Total catch: 958.10 CATCH/HOUR: 1916.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Sphyræna ensis	840.00	11340	43.83	233
Anchoa sp	422.40	212044	22.04	
Penæus vannamei	158.40	4224	8.26	
Opistherus equitorialis	144.00	5656	7.51	
Opisthopterus dovii	96.00	39168	5.00	
Polydactylus approximans	48.00	2208	2.50	
Polydactylus opercularis	24.00	960	1.25	
Selene peruvianus	19.20	2112	1.00	
Peprilus snyderi	19.20	144	1.00	
Opisthonema libertate	19.20	1680	1.00	
Loliopsis diomedæe	14.40	1200	0.75	
Pomadasys panamensis	14.40	720	0.75	
Peprilus medius	14.40	240	0.75	
Cynoscion phoxocephalus	14.40	864	0.75	
Chloroscombrus orqueta	14.40	384	0.75	
Pseudupeneus grandisquamis	9.60	192	0.50	
Lycengraulis poeyi	9.60	144	0.50	
Bairdiella chrysoleuca	9.60	336	0.50	
Hemicarax leucurus	9.60	48	0.50	
Penæus stylirostris	4.80	144	0.25	
Larimus acclivis	4.80	96	0.25	
Xenichthys xanti	2.40	48	0.12	
Cynoscion reticulatus	2.40	48	0.12	
Symphurus sp	1.00	96	0.05	
Total	1916.20		99.93	

R/V DR. FRIDTJOF NANSEN  
PROJECT: LA

CATCH DATA

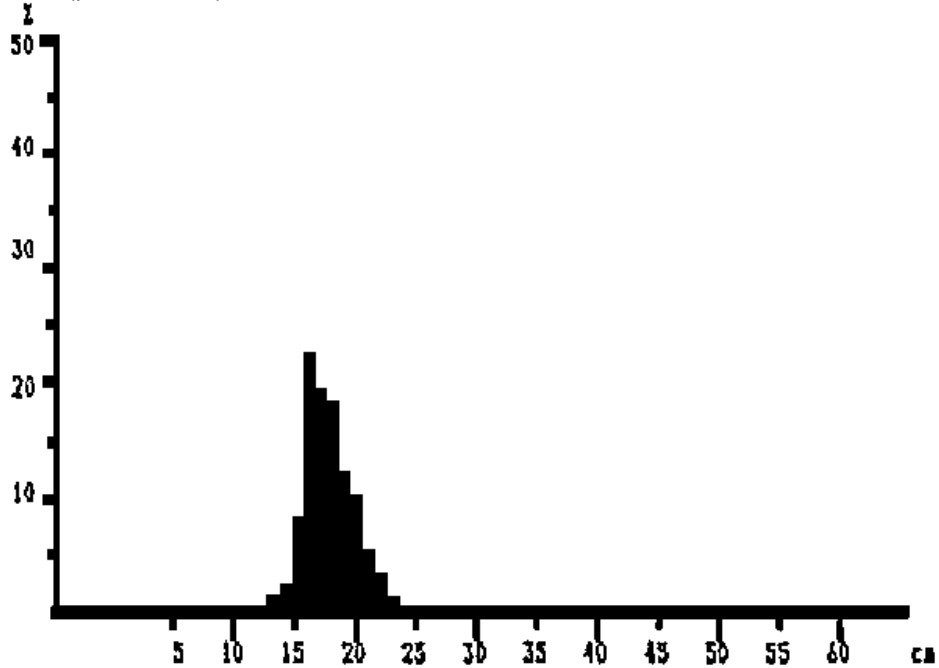
PROJECT STATION: 417

DATE: 6/1/87  
 start stop duration  
 TIME: 14:21:00 14:51:00 30 (min) Purpose code: 3  
 LOG: 7110.10 7111.30 1.20 Area code: 6  
 FDEPTH: 78 78 GearCond. code: 1  
 BDEPTH: 78 78 Validity code: 3  
 Towing dir: 195° Wire out: 350 m Speed: 25 kn\*10  
 Sorted: 22 Kg Total catch: 22.20 CATCH/HOUR: 44.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Lutjanus colorado	24.40	4	54.95	
Loliopsis diomedæe	20.00		45.04	
Total	44.40		99.99	

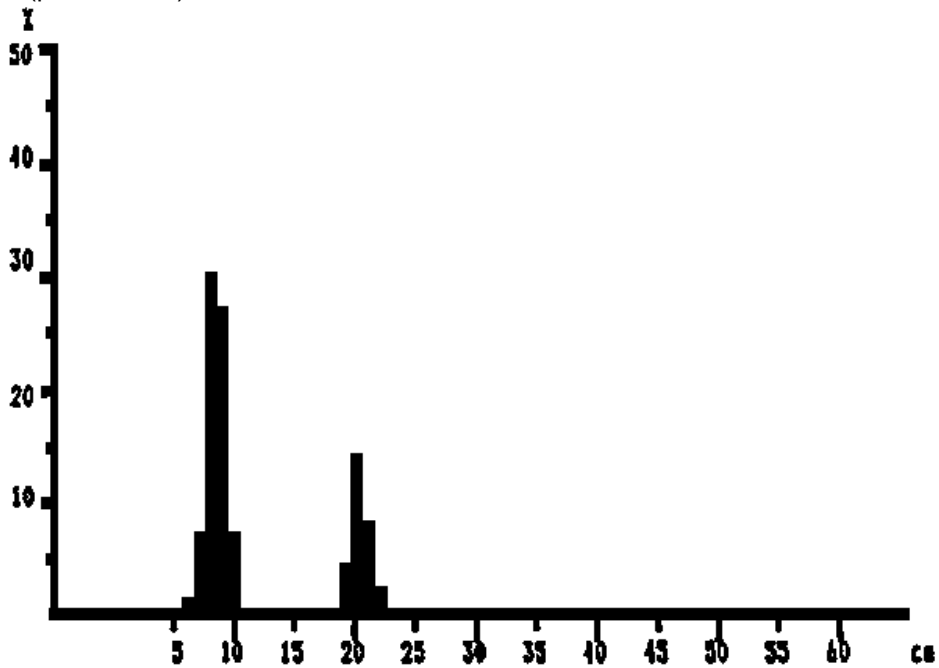
## ANNEX 4. POOLED LENGTH FREQUENCY DISTRIBUTIONS OF MAIN SPECIES CAUGHT

Prionotus ruscarius (pooled data)



Nicaragua  
 MEAN LENGTH = 17,6cm N = 119  
 Modes: , 16cm  
 NUMBER OF SUBSAMPLES: 3  
 SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
 LOWEST STATION: 29 HIGHEST STATION: 416

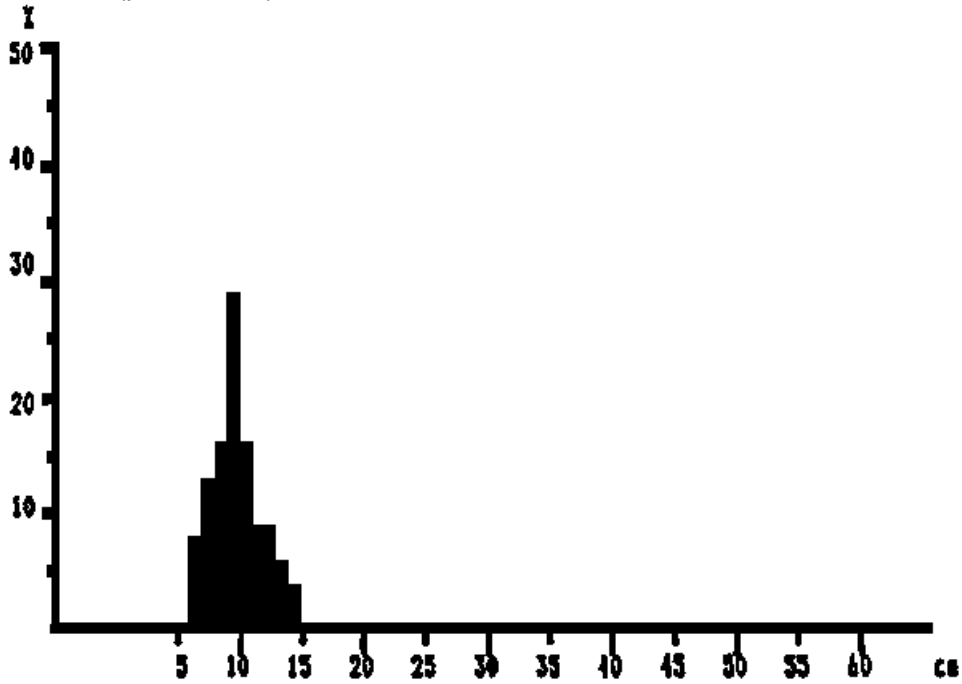
Peprilus snyderi (pooled data)



Nicaragua  
 MEAN LENGTH = 11,6cm N = 102  
 Modes: , 8cm, 20cm  
 NUMBER OF SUBSAMPLES: 2  
 SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
 LOWEST STATION: 29 HIGHEST STATION: 416

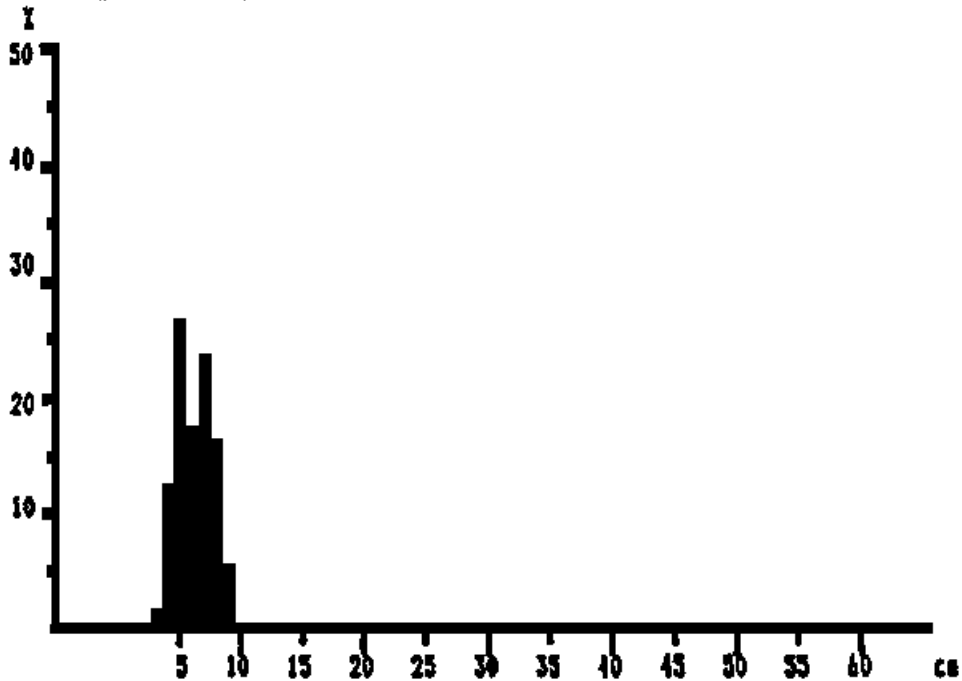


*Penaeus californiensis* (pooled data)



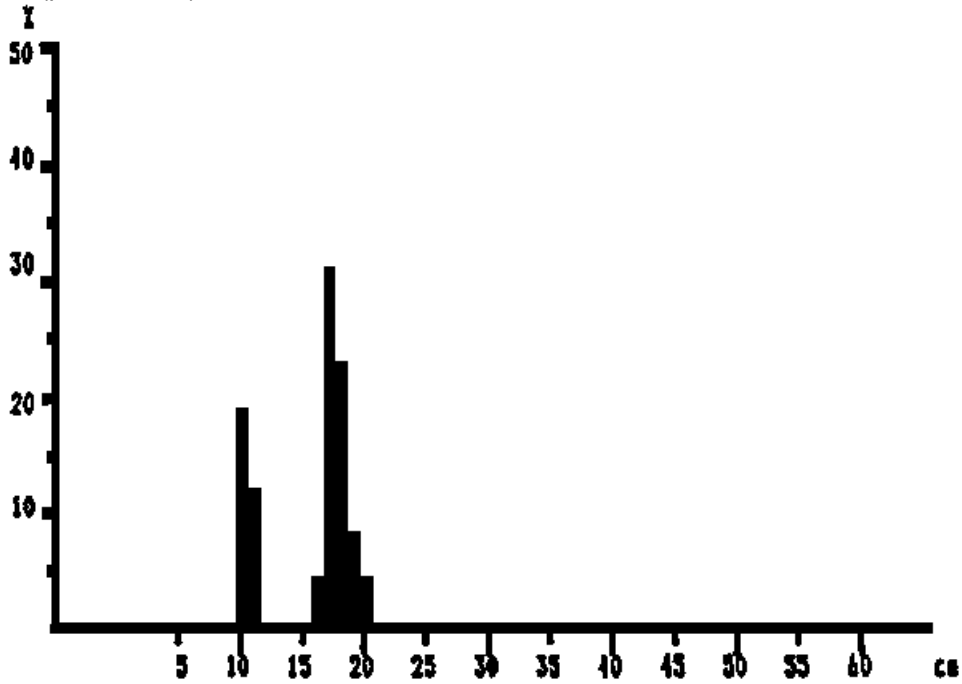
Nicaragua  
MEAN LENGTH = 9,2cm N = 164  
Modes: , 9cm  
NUMBER OF SUBSAMPLES: 2  
SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
LOWEST STATION: 29 HIGHEST STATION: 416

*Loliopsis diomedea* (pooled data)



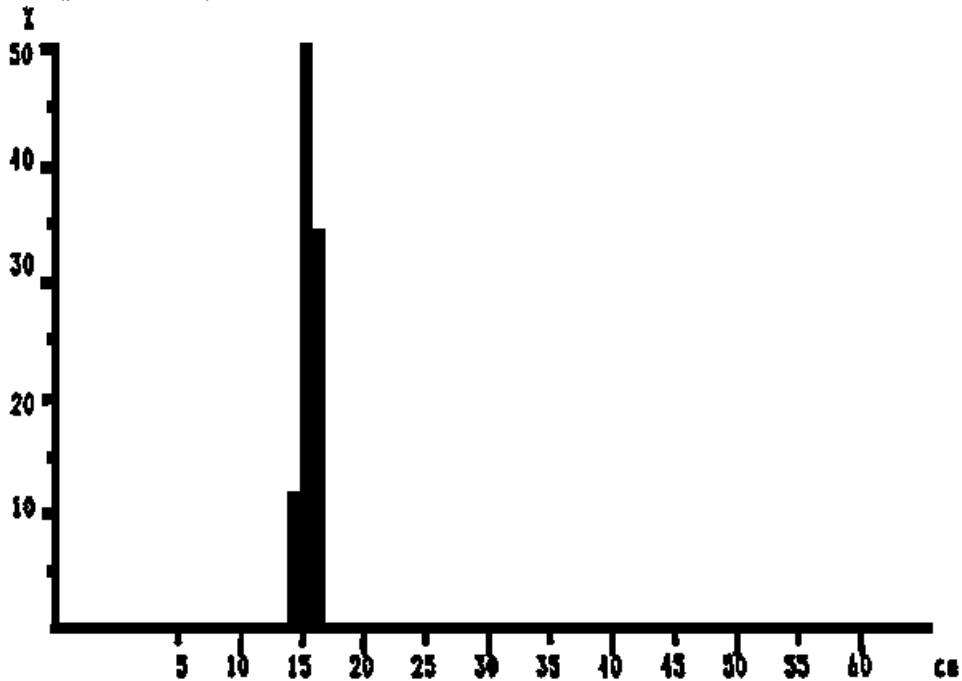
Nicaragua  
MEAN LENGTH = 6,1cm N = 243  
Modes: , 5cm, 7cm  
NUMBER OF SUBSAMPLES: 2  
SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
LOWEST STATION: 29 HIGHEST STATION: 416

*Peprilus medius* (pooled data)



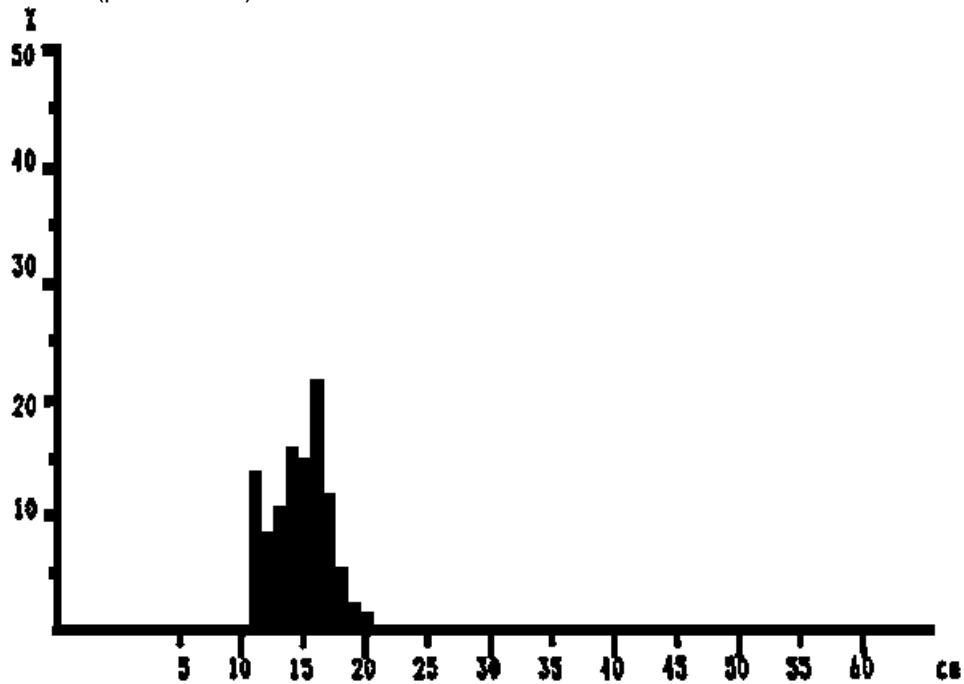
Nicaragua  
 MEAN LENGTH = 15,4cm N = 26  
 Modes: , 10cm, 17cm  
 NUMBER OF SUBSAMPLES: 1  
 SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
 LOWEST STATION: 29 HIGHEST STATION: 416

*Argentina aliciae* (pooled data)



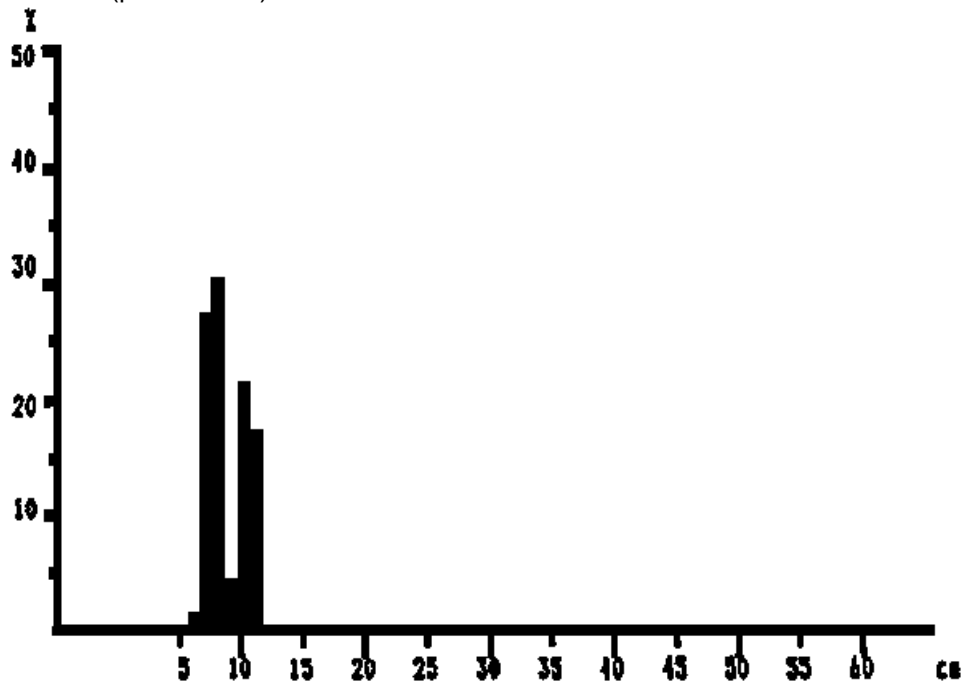
Nicaragua  
 MEAN LENGTH = 15,2cm N = 187  
 Modes: , 15cm  
 NUMBER OF SUBSAMPLES: 2  
 SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
 LOWEST STATION: 29 HIGHEST STATION: 409

*Penaeus brevirostris* (pooled data)



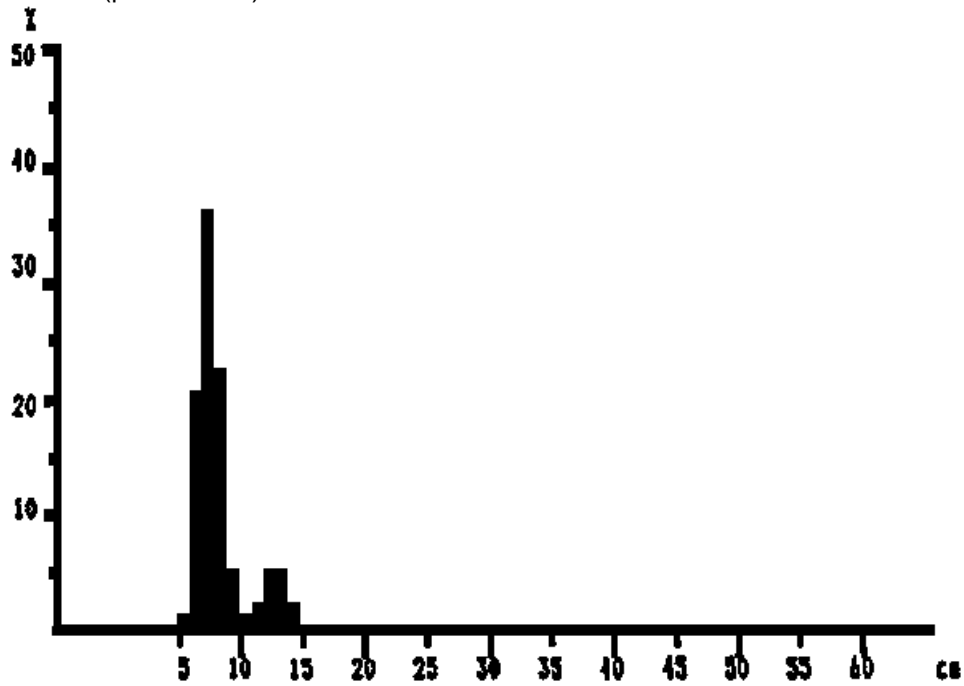
Nicaragua  
 MEAN LENGTH = 14,5cm N = 287  
 Modes: , 11cm, 14cm, 16cm  
 NUMBER OF SUBSAMPLES: 4  
 SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
 LOWEST STATION: 29 HIGHEST STATION: 416

*Heterocarpus vicarius* (pooled data)



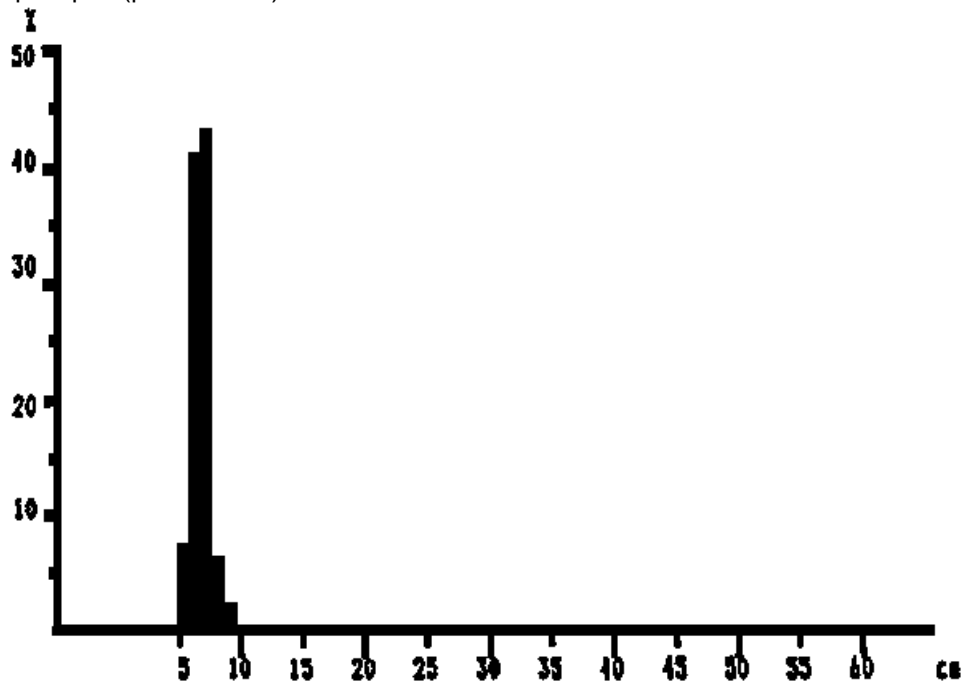
Nicaragua  
 MEAN LENGTH = 8,6cm N = 248  
 Modes: , 8cm, 10cm  
 NUMBER OF SUBSAMPLES: 2  
 SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
 LOWEST STATION: 29 HIGHEST STATION: 416

Anchoa argentivittata (pooled data)



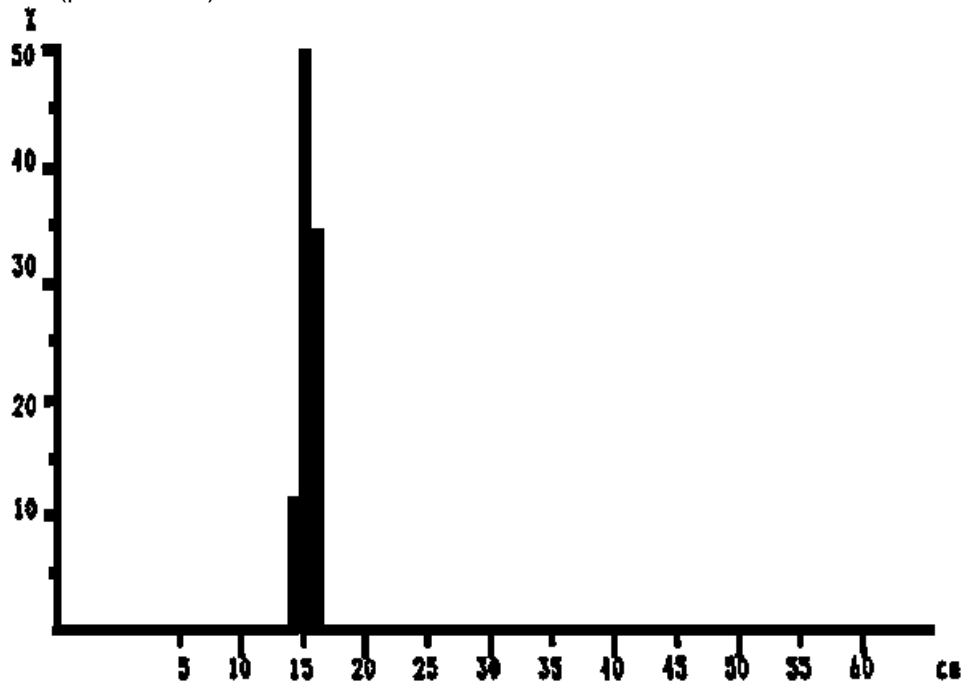
Nicaragua  
MEAN LENGTH = 7,9cm N = 486  
Modes: , 7cm, 13cm  
NUMBER OF SUBSAMPLES: 4  
SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
LOWEST STATION: 29 HIGHEST STATION: 409

Pleuroncodes planipes (pooled data)



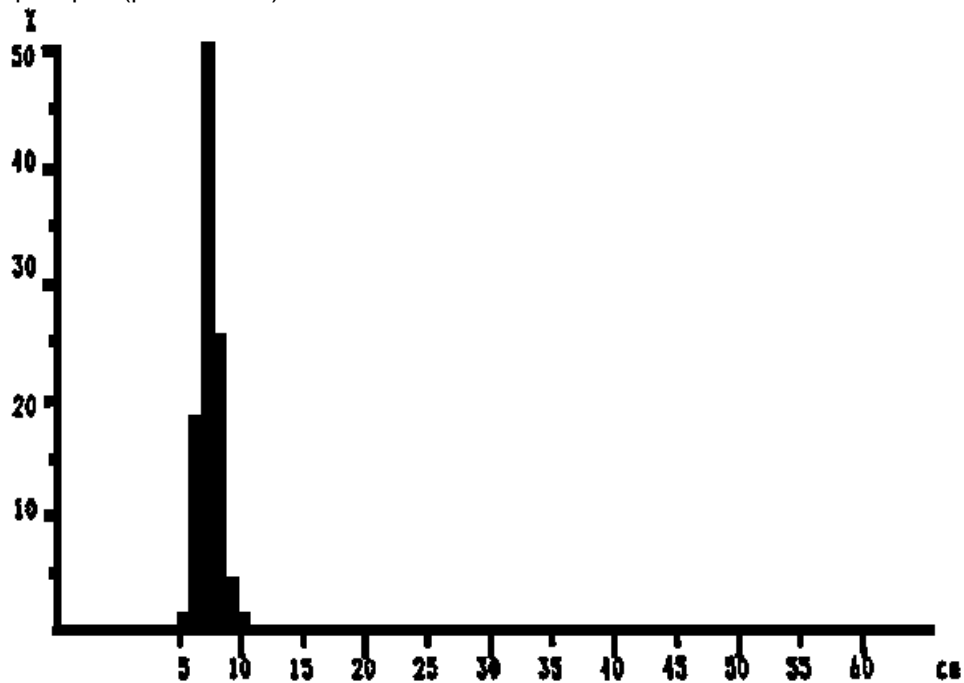
Nicaragua  
MEAN LENGTH = 6,5cm N = 1055  
Modes: , 7cm  
NUMBER OF SUBSAMPLES: 7  
SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
LOWEST STATION: 29 HIGHEST STATION: 416

Argentina aliceeae (pooled data)



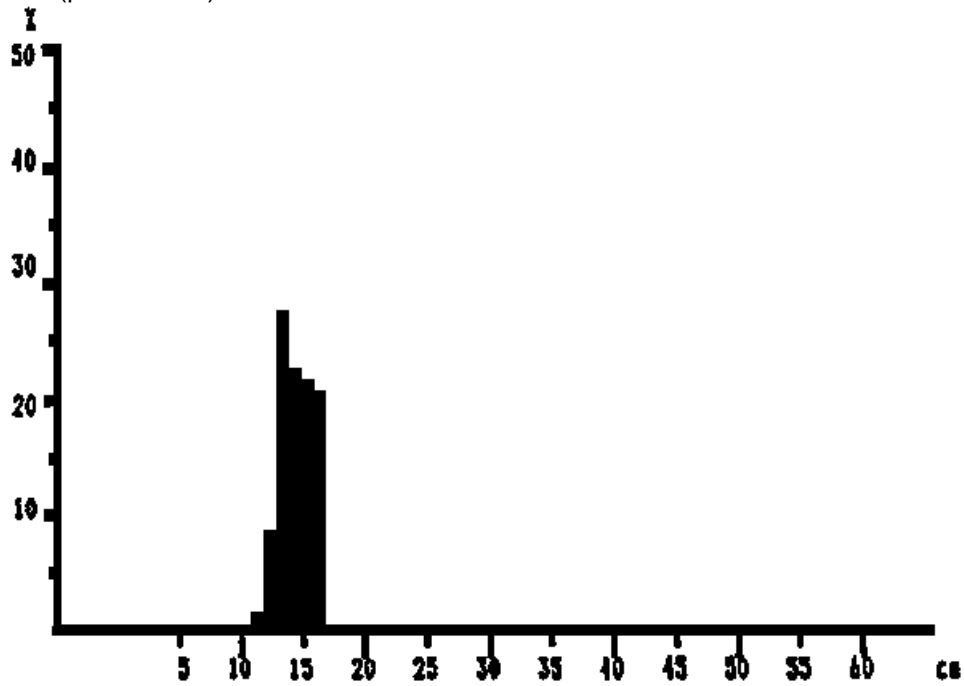
Nicaragua  
MEAN LENGTH = 15,2cm N = 187  
Modes: , 15cm  
NUMBER OF SUBSAMPLES: 2  
SAMPLES FROM ST.NO.: 338 UNTIL ST.NO.: 383  
LOWEST STATION: 29 HIGHEST STATION: 416

Pleuroncodes planipes (pooled data)



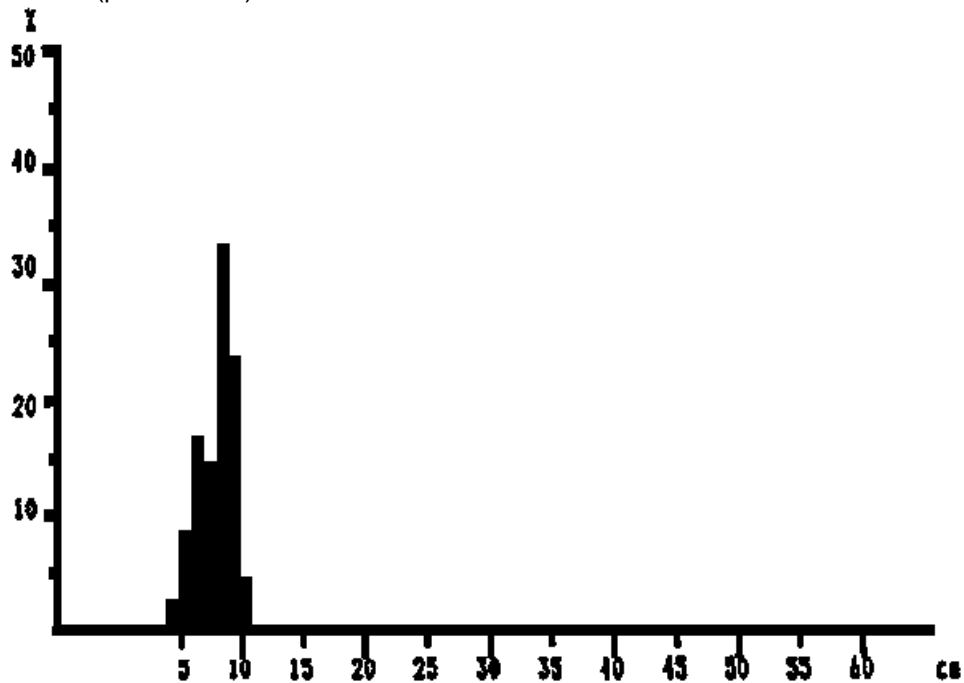
El Salvador  
MEAN LENGTH = 7,1cm N = 1090  
Modes: , 7cm  
NUMBER OF SUBSAMPLES: 11  
SAMPLES FROM ST.NO.: 384 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416

Argentina aliceeae (pooled data)



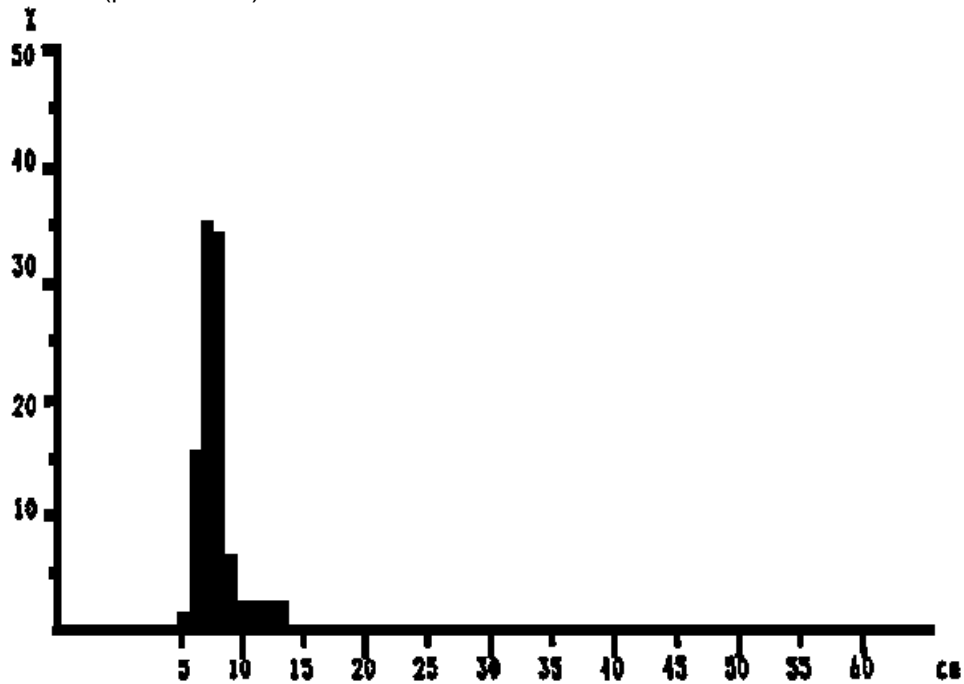
El Salvador  
MEAN LENGTH = 14,1cm N = 251  
Modes: , 13cm  
NUMBER OF SUBSAMPLES: 3  
SAMPLES FROM ST.NO.: 384 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416

Loliopsis diomedeeae (pooled data)



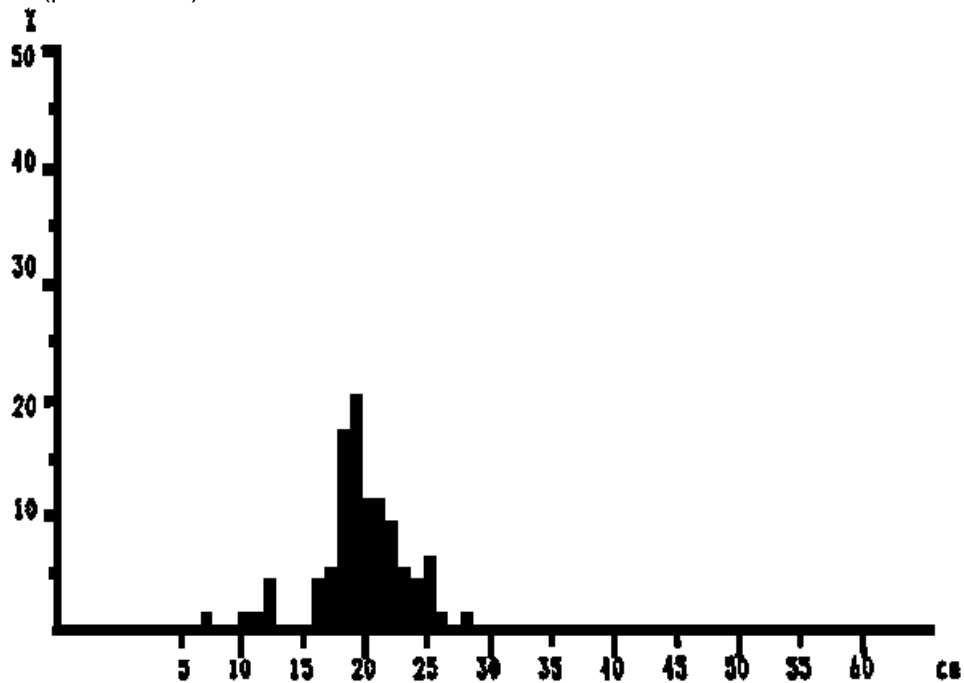
El Salvador  
MEAN LENGTH = 7,5cm N = 184  
Modes: , 6cm, 8cm  
NUMBER OF SUBSAMPLES: 3  
SAMPLES FROM ST.NO.: 383 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416

Anchoa argentivittata (pooled data)



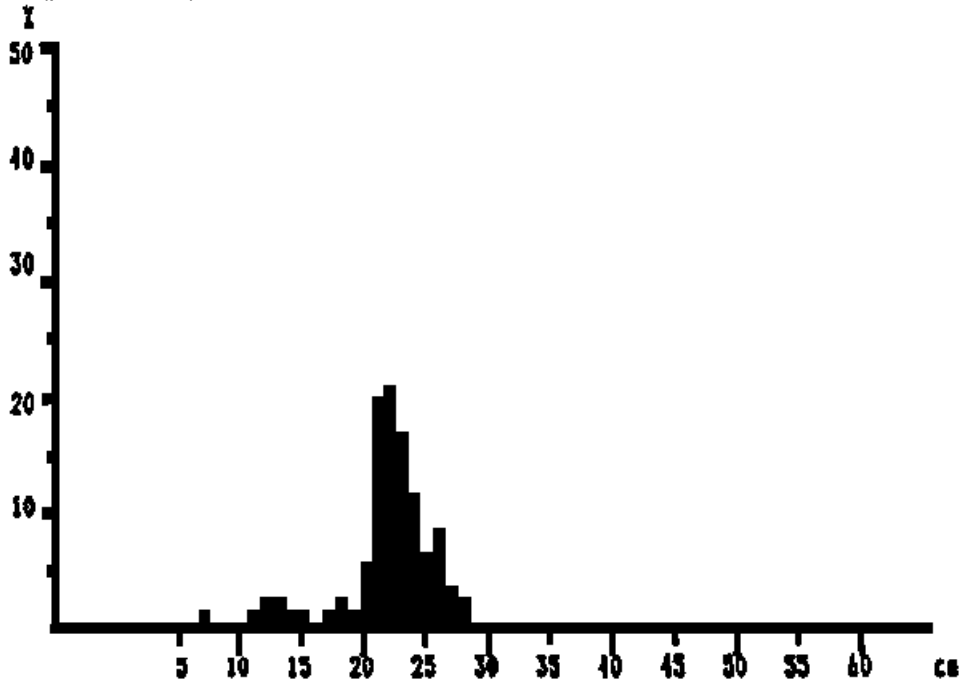
El Salvador  
MEAN LENGTH = 7,6cm N = 1285  
Modes: , 7cm  
NUMBER OF SUBSAMPLES: 7  
SAMPLES FROM ST.NO.: 384 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416

Peprilus medius (pooled data)



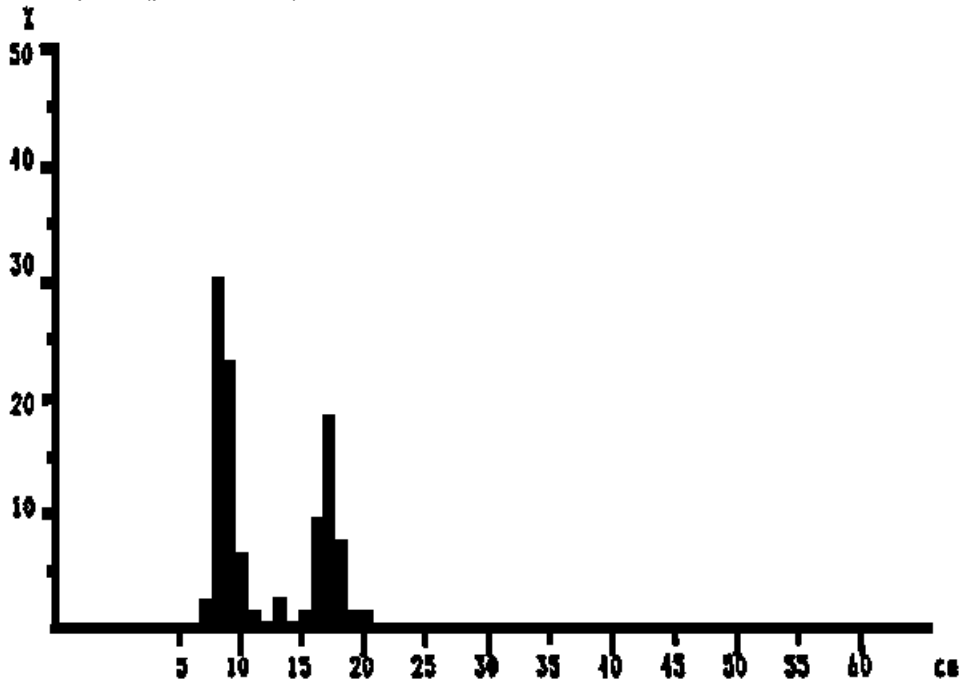
El Salvador  
MEAN LENGTH = 19,6cm N = 141  
Modes: , 7cm, 12cm, 19cm, 25cm, 28cm  
NUMBER OF SUBSAMPLES: 4  
SAMPLES FROM ST.NO.: 384 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416

*Peprilus snyderi* (pooled data)



El Salvador  
MEAN LENGTH = 22,0cm N = 122  
Modes: , 13cm, 18cm, 22cm, 26cm  
NUMBER OF SUBSAMPLES: 4  
SAMPLES FROM ST.NO.: 384 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416

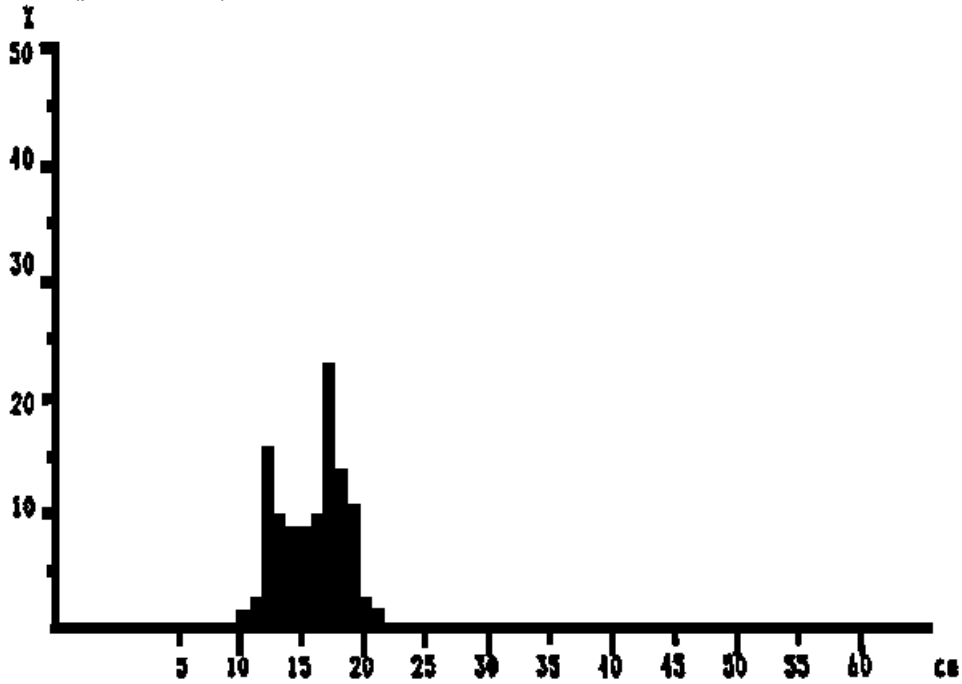
*Chloroscombrus orqueta* (pooled data)



El Salvador  
MEAN LENGTH = 11,7cm N = 133  
Modes: , 8cm, 13cm, 17cm  
NUMBER OF SUBSAMPLES: 2  
SAMPLES FROM ST.NO.: 384 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416

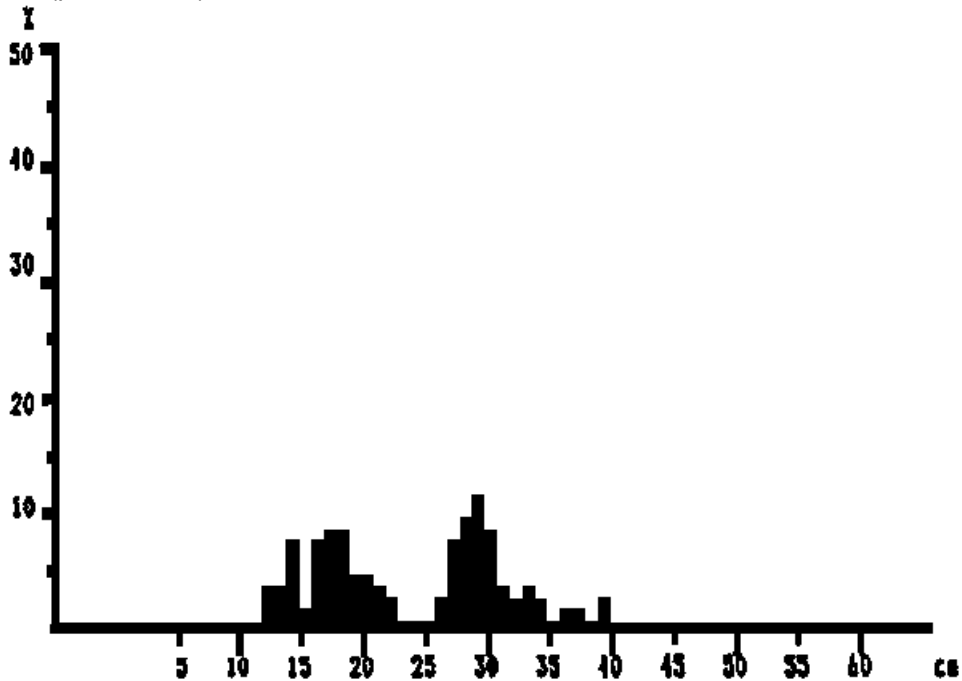


Selene peruvianus (pooled data)



El Salvador  
MEAN LENGTH = 15,6cm N = 88  
Modes: , 12cm, 17cm  
NUMBER OF SUBSAMPLES: 2  
SAMPLES FROM ST.NO.: 384 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416

Sphyraena ensis (pooled data)



El Salvador  
MEAN LENGTH = 23,3cm N = 117  
Modes: , 14cm, 18cm, 29cm, 33cm, 37cm, 39cm  
NUMBER OF SUBSAMPLES: 2  
SAMPLES FROM ST.NO.: 384 UNTIL ST.NO.: 417  
LOWEST STATION: 29 HIGHEST STATION: 416