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Report of voyage on Spanish stern trawler CORBA
16-21 October 1976

by

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In cooperation with

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This report covers a voyage by personnel of the United States and Spanish governments on board the Spanish stern trawler CORBA from October 16 through October 21, 1976. Representing the government of the United States was Kevin R. Sullivan, Special Agent, National Marine Fisheries Service, Law Enforcement Branch, New Bedford, Massachusetts. Representing the Spanish government was Enrique Cesar Lopez Veiga, Fisheries Biologist, Vigo, Spain.

The purpose of the voyage was to monitor the incidence of bycatch in the squid fishery, to sample the catch for biological and statistical information, and to document the fishing and processing techniques of the vessel. Also, the voyage allowed for a practical evaluation of the proposed United States observer program to be effected with extension of fisheries jurisdiction. Comments on the observer program will be submitted in a subsequent report.

Ship's Characteristics

CORBA (VI-5-9513) was built in Vigo, Spain in 1975. The owner is Jose Lorenzo, Pesquera Rias Bajas, Vigo. Its overall length is 39.7 meters (127'), length between perpendiculars - 32 meters (102.4'),

beam - 8.8 meters(21'), depth - 3.9 meters(12.4'), draught - 3.3 meters(10.5'), gross tonnage - 299.3 mt, net tonnage - 100.6 mt, dead weight - 237 mt, maximum speed - 12 knots, engine - 1235 HP Stork Werkspoor diesel, fish hold capacity - 240-250 mt

Summary of Catch

CORBA arrived in the mid Atlantic to begin its squid trawling operations on October 7, 1976. It will continue to fish for squid until the holds are full, sometime in December. Below are the entries in CORBA's trawl logbook for the period of October 7 through October 15, 1976:

OCTOBER 7 - loligo .47 mt, illex .43 mt, red hake .05 mt(discard)
OCTOBER 8 - loligo 1.45 mt, illex 2.07 mt, silver hake .6 mt(discard)
OCTOBER 9 - loligo .3 mt, illex 1.4 mt, red hake .04 mt (discard)
OCTOBER 10 - loligo .5 mt, illex .7 mt, flounder .02 mt (discard)
OCTOBER 11 - loligo .4 mt, illex .7 mt, flounder .02 mt (discard)
OCTOBER 12 - loligo 1.1 mt, illex .9mt, flounder .03 mt (discard)
OCTOBER 13 - loligo 1.1 mt, illex .7 mt, flounder .02 mt (discard)
OCTOBER 14 - loligo 1.2 mt, illex .6 mt, flounder .02 mt (discard)
OCTOBER 15 - loligo .7 mt, illex .45 mt

As of October 16, after nine days fishing, CORBA had 9.4 tons of loligo and 8 tons of illex on board, all other species were discarded. Like the other Spanish companies, CORBA's owners specifically told the master to catch and retain only squid, preferably loligo. Prices paid for loligo in Spain range from 60-90 pesetas per kilogram while illex brings only 40-50 pesetas per kilogram (70 pesetas = one dollar).

From October 17 to October 21 CORBA caught 8.4 metric tons of squid - 6.2 tons of loligo and 2.2 tons of illex. The bycatch, mostly butterfish, hakes and crabs, totaled 7.8 tons during that time. All bycatch was discarded. Squid comprised 51.8% of the entire catch with 48.2% bycatch. The trawl by trawl catch stat-

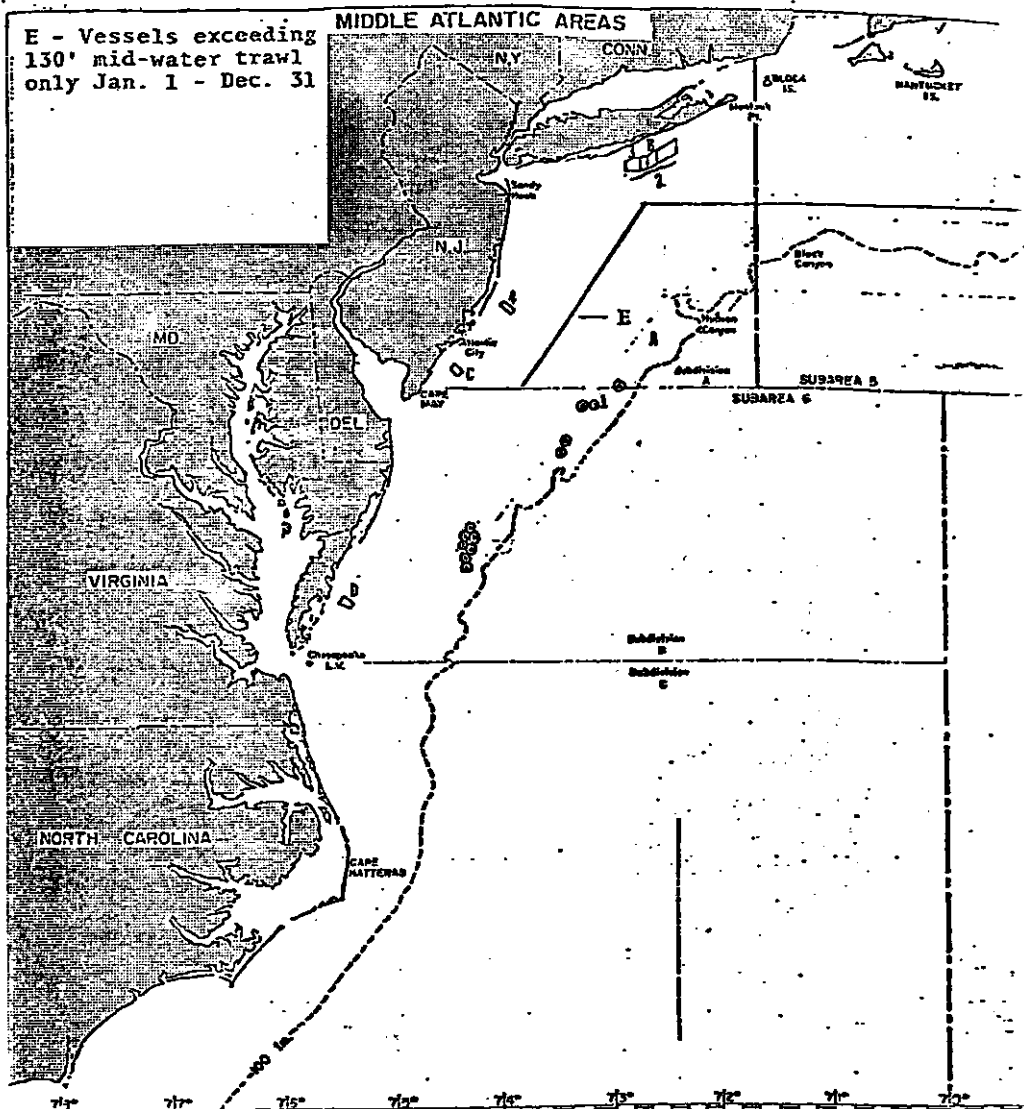
istics are attached to this report. The amounts listed for squid are exact - they reflect the numbers of blocks from each trawl multiplied by ten kilograms, the weight of a single block. Amounts listed for other species are a compromise of the estimates by the U.S. observer, the Spanish observer, and the captain.

Fishing Areas and Seasons

The Spanish squid fishing grounds are determined by season and traditional areas of good fishing. The loligo (Calamar) season begins in late October and ends in February while illex (Pota) is harvested in June and July. Apparently, since only 38% of CORBA's catch was loligo, from October 17-21, the season had not yet begun. The master was confident that the loligo catches would dramatically increase by the beginning of November like in years past. Though he did not rely on specific water temperature as a squid finding technique, the master was convinced that the water was still a bit too warm for loligo. When the water becomes cooler the loligo will school and pure catches will follow. At that time, the illex catch will decrease.

The areas fished during the week were from 60-80 miles east of Cape May, New Jersey and from 40-50 miles east of Chincoteague Inlet, Virginia. Trawls were made in depths of 50 to 70 fathoms. The bottoms fished were sand and mud. (see chartlet page 5) The master said that the 70-100 fathom curve from Hudson to Block Canyon is a more productive loligo ground at this time of year. But due to the abundance of lobster gear in that area, the master prefers to stay clear.

Though they work generally in the same areas, the Spanish masters do not exchange catch statistics even with vessels of the same company. They rely heavily on their past experience on the grounds for finding squid.



E - Vessels exceeding 130' mid-water trawl only Jan. 1 - Dec. 31

SPANISH OBSERVER PROGRAM
OCTOBER 16 THROUGH 21, 1976
SPANISH STERN TRAWLER "CORBA"
OBSERVERS: SPECIAL AGENT K. R. SULLIVAN
SEÑOR ENRIQUE VEIGA

⊙ - INDICATES POSITION OF TRAWL

Fishing Gear

The main winch is powered by a 170 HP engine manufactured by the Carral Company of Coruna, Spain. The two main drums haul the trawl warps and two gypsy heads work the cables which move the net on deck. The Chief Engineer said that this winch is the best quality available in Spain.

The trawl warps are 22 mm in diameter; most other Spanish squid stern trawlers use a warp 24 mm in diameter. The amount of warp set out is as follows: in 50 fathoms of water - 450 meters, in 60-70 fathoms - 500 meters, in 70-80 fathoms - 600 fathoms, and in 80-100 fathoms - 700 meters.

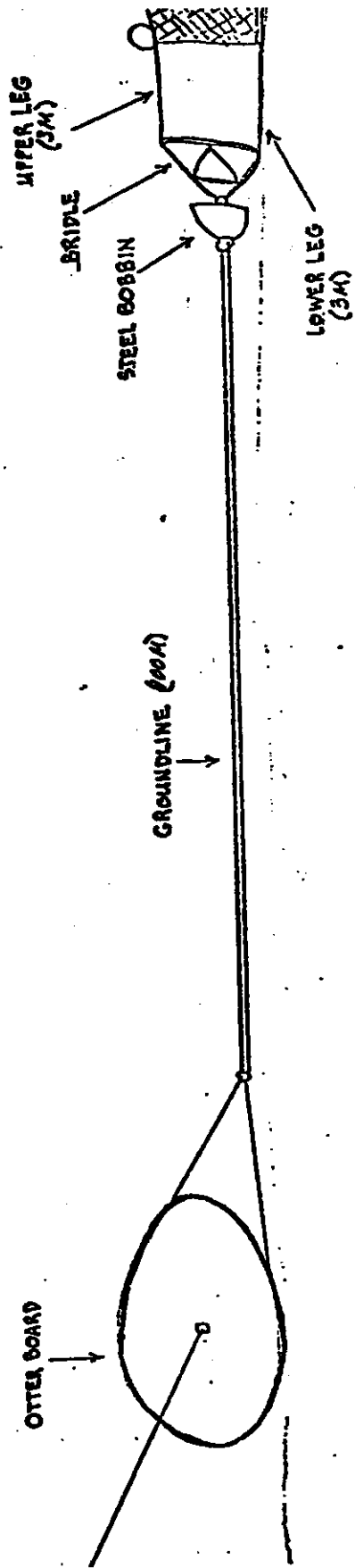
The otter boards are oval demersal type, constructed of steel. The weight of each is 900 kilograms, the height is 1.70 meters and the length is 2.90 meters. These doors were manufactured in France. Also on board is one set of conventional rectangle type wooden doors which will not be used unless the oval doors are lost.

The groundline is constructed of four wire cables twisted together and covered with nylon twine. Their diameter is 46-48 mm. Each line is 100 meters long and weighs about 230 kilograms. Attached to the after end of each groundline is a steel bobbin (weight 50 kilograms, diameter about 25 inches) to which a steel triangular bridle is shackled. The upper and lower legs are fastened to this bridle. They are each 3 meters long. (see diagram page 7)

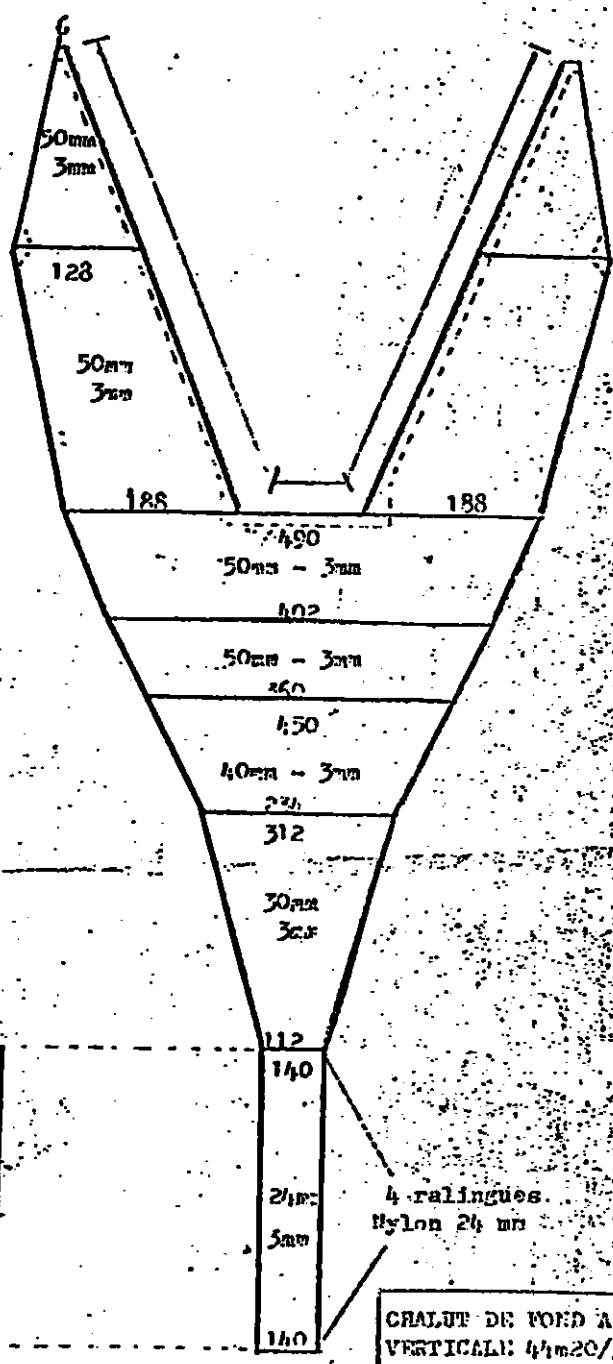
Net - CORBA carries six French made nylon nets on board. (see diagram page 8) The twine width is 3 mm with mesh sizes of 50 mm in the wings to 40 mm in the codend. Attached to the underside of the codend is a chafer/strengthener with a mesh size of 50 mm. There are no floats attached to the belly or the codend as in some demersal fisheries.

The distance from the headrope to the beginning of the codend is 32.5 meters, 10 meters forward of the footrope which is 22.5 meters from the beginning of the codend. The codend itself is 12 meters long.

DOOR, GROUNDLINE, AND LEG RIGGING - SPANISH FLY "CORBA"



*PESO: 100 kg y puente
DIMENSIONES: 3100 x 1200*



Vite P.P.
22 m

double poche



4 ralingues
Nylon 24 mm

CHALUT DE FOND A GRANDE OUVERTURE
VERTICALE: 4/1m20/57-10 - pour la pêche
du poulpe - bateau de 1300 CV

COMPTOIR FICAMPOIS DE MATERIEL DE PECHE
31 Route de Valmont 76400 FICAMPE

The footrope is of the same construction as the groundlines (i.e. four wires twisted and covered with nylon twine - 46-48 mm diameter) with the addition of a thin rubber covering. There are no rollers or other attachments on the footrope. At the beginning of this trip a sweep chain (12-14 mm diameter) was attached to the footrope. It was taken off after two trawls because it fished too hard on the bottom. The master noted that the footrope should slide very easily over the bottom for maximum efficiency in the squid fishery.

Twenty aluminum floats, 200 mm in diameter, are attached to the headrope at the mouth. From the mouth extending out on the wings the floats are fastened to the headrope as follows: 5 floats $\frac{1}{2}$ meter apart, 5 floats 1 meter apart, 5 floats $1\frac{1}{2}$ meters apart, and 5 floats 2 meters apart. The battery operated transducer to the Kodon net monitor is fastened to the center of the headrope.

The mouth opening at the headrope is about 6 meters while the opening at the footrope is about 4 meters. The height of the mouth opening is only about $1\frac{1}{2}$ meters. The master explained that this relatively short height is more effective in a squid fishery as opposed to a high opening trawl.

Fishing Operations, Squid Handling, and Processing

CORBA fishes for squid only during daylight hours. Normally four trawls are made per day weather permitting. Each trawl lasts 2 to $3\frac{1}{2}$ hours. The master said that longer trawls would damage the quality of the squid. The trawling speed averages $2\frac{1}{2}$ knots and never more than 3 knots.

The master said that night fishing for squid is unproductive as the squid disperse and move from the bottom toward the surface. It is not worthwhile to the master to fish at night with high fuel costs and a fairly small crew. At night, the crew

completes processing the day's catch and repairs any damaged gear until about 11:00 p.m.

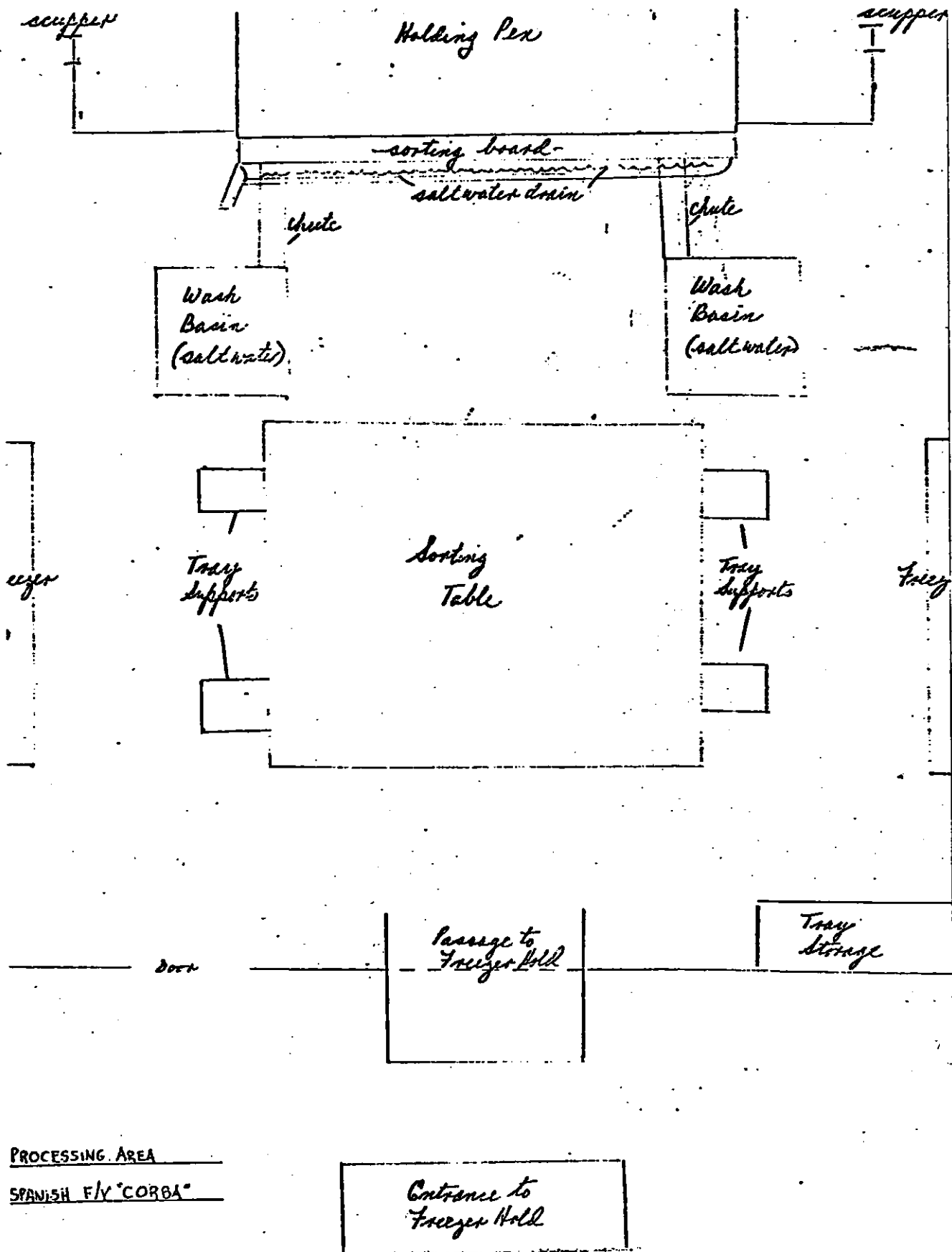
During each haulback, six crewmen handle the net, two men control the main drums on the winch and two men work the gypsy heads. Portable straps and cables run through blocks over the pilot house to the gypsy heads pull the net onto the deck piece by piece.

Once the codend is on deck, the entire top half is opened rather than the after end. The catch is then dumped into the holding pen below deck through a hydraulic hatch. The first species taken from the holding pen were the lobsters and crabs. They were discarded quickly but extremely gently. The captain and crew were well aware of the United States law protecting creatures of the continental shelf. Even the jonah crabs, which are not covered under law, were handled like delicate glassware.

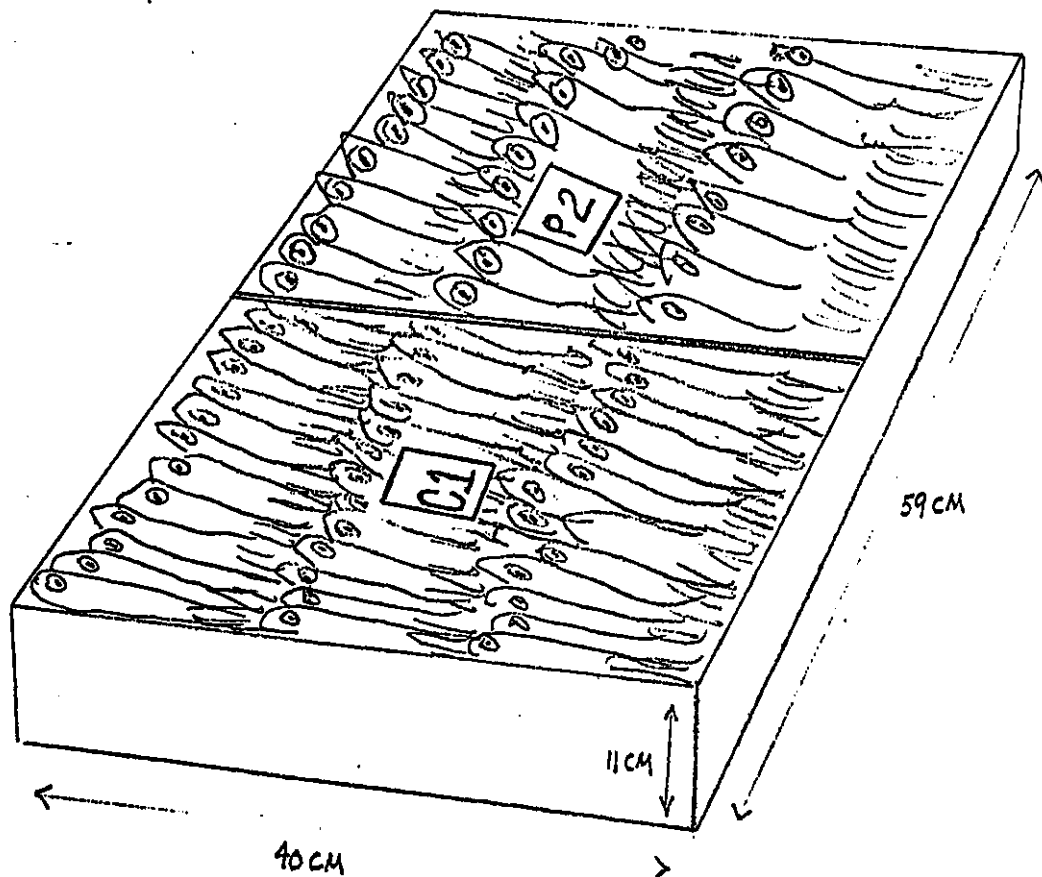
Three crewmen sort the catch from within the holding pen placing the squid in baskets and shovelling the bycatch out the scuppers. The baskets of squid are dumped onto a chute leading into a wash basin. Here the squid receive a brief salt water bath. When they are removed from the basin and dumped onto the sorting table, the squid appear to be very clean showing no visible signs of ink. (see diagram of processing room on page 10)

On the sorting table three or four crewmen separate the squid into loligo or illex. The individual squids are quickly measured with a crude wooden guage for sorting into size categories.

These categories are as follows: for loligo, #1=27 cm and longer, #2=22-27 cm, #3=18-22 cm, #4=14-18 cm, #5=10-14 cm and #6=shorter than 10 cm; for illex, #1=18 cm and longer, #2=14-18 cm and #3= shorter than 14 cm.



SQUID FREEZING TRAY



TOTAL WEIGHT = 20 KG SQUID

~~10 KG SQUID~~

The squid are placed into trays by size category. The trays are divided in half by a metal plate making it possible to produce two frozen blocks of different sized squid. (see diagram of squid tray page 11.) When half the tray is filled a paper label is placed on the top. (e.g. for a block of #1 loligo, the label C-1 is used, C=Calamar; for a block of illex #2, the label P-2 is used, P=Pota) When the entire tray is filled, it is placed in one of the freezers located about 6 feet from the sorting table. A full tray weighs 20 kilograms; each block weighs 10 kilograms.

Each of the two frozen freezers holds 99 trays - about 2 tons of squid. Two 36 HP Grenko (Dutch) compressors with two 238 HP Stork Werkspoor diesel engines power the freezers. The squid is frozen at -32° C for six hours. The blocks are then sprinkled with salt water and placed in plastic bags. They are handed through a passage to the main freezer where they are stored at a temperature of -25° C to -30° C. One 16 HP Grenko compressor and a 168 HP diesel engine maintain this temperature. The Chief Engineer emphasized the importance of temperature control. When the squid is offloaded in Spain, health inspectors carefully check the temperature of the blocks. If a block does not meet a specific temperature it is rejected.

Experimental Gear

During this trip CORBA used a net sounder for the first time. A Koden Net Monitor (NM 850AT) was installed at the suggestion of Spanish government scientist with the hope of reducing the bycatch. They felt that if the master could see indications of species other than squid entering the net, he could move the operation to another area.

Unfortunately, the monitor was erroneously installed. It indicated water temperature, which was of little interest to the master,

but did not indicate fish at the net mouth. The master believes that the use of a sounder may be a partial solution to excessive bycatch during transitional seasons of certain fisheries. But at the height of the season when squid catches are pure, the sounder is not necessary.

One trawl was made with an experimental sample net measuring only about 4 meters long. The objective of its use is to locate concentrations of squid. The net was towed for 2 hours yielding some starfish and one anglerfish. All Spanish stern trawlers carry one of these nets but they are not used. The concensus of the Spanish masters is that the use of this net is a waste of commercial fishing time.

Catch Sampling

Instead of measuring samples of the catch on board, several frozen blocks of bycatch and squid of different size categories from different trawls were taken to the NMF3 laboratory in Woods Hole, Massachusetts. Senor Veiga felt that this procedure facilitates a more thorough biological and statistical examination of the species under favorable working conditions.

Electronic Equipment on bridge

1. Furuno Loran C-A Receiver (Japan)
2. Kodan Net Monitor NM850AT (Japan)
3. "Sailor" SP Radio T-121 (Denmark)
4. "Sailor" FM Receiver RT143 (Denmark)
5. Sems Transceiver Radio ER400TF
6. Krupp Atlas Echograph 450 (Germany)
7. Krupp Atlas Fischfinder 700 (Germany)
8. Decca Navigator
9. Trevin Short Wave Radio TD-1.
10. Noeuds Odometer
11. C-Plath Automatic Pilot
12. OKI Radar NX1043
13. Atlas Radar

CATCH STATISTICS - SPANISH F/V " CORBA "

OCTOBER 17-21, 1976

	OCTOBER 17				OCTOBER 18				OCTOBER 19				TOTAL
	0900-1130	1240-1500	1600-1900	0600-0900	1000-1200	1345-1640	1730-2100	0655-1000	1100-1400	1525-1800			
1 SET OUT POSITION	37 47 N	38 38 N	38 32 N	37 59 N	37 44 N	37 53 N	37 43 N	37 53 N	37 44 N	37 57 N			
2	73 09 W	73 18 W	73 21 W	74 11 W	74 16 W	74 19 W	74 19 W	74 11 W	74 17 W	74 13 W			
3 HAULBACK POSITION	41 N	38 N	38 N	37 46 N	37 52 N	37 43 N	37 35 N	37 48 N	37 58 N	37 43 N			
4	73 16 W	73 23 W	73 18 W	74 16 W	74 14 W	74 20 W	74 23 W	74 17 W	74 11 W	74 18 W			
5 DEPTH-BEGIN/END	55 TO 52 F	50 TO 52 F	60 TO 60 F	52 TO 54 F	52 TO 52 F	50 TO 54 F	57 TO 52 F	54 TO 58 F	50 TO 59 F	52 TO 55 F			
6 SPECIES	AMOUNTS IN KILOGRAMS											TOTAL	
7 LOLIGO #1													
8 #2													
9 #3			30	30	60	40	30	10	20	60	40		
10 #4			60	60	940	410	680	210	780	190	260		
11 #5			40	60	560	310	540	150	420	150	180		
12 #6													
13 ILLEX #1	30	60	270	140	290	90	110	110	150	170			
14 #2	30	80	330		10	80		80	40	40			
15 #3			30			10							
16 BUTTERFISH	400	500		200	120	40	10	15	1000	450			
17 RED HAKE	5	3	2	150	30	10	10	25	60	70			
18 SILVER HAKE	5	3	4	100		5	3	10	25	50			
19 ANGLERFISH		5	5		5	5		5	4	5			
20 JONAH CRAB		80	50	30	50	35	25	80	20	20			
21 LOBSTER		5		3	4	6	7	5	5	7			
22 4 SPOT FLOUNDER			20	10	8	8							
23 SKATES			2	4	6	3	3	3	4	3			
24 CHAIN DOGFISH			1										
25 SPOTTED HAKE				150	10	5	3	30	25	50			
26 BLUEFISH						10				3			
27 BLACK SEA BASS								2					
28 SMOOTH DOGFISH								10					
29 HAULBACK TOTALS	4070 KG	856 KG	834 KG	2351 KG	1293 KG	1536 KG	571 KG	1308 KG	1733 KG	1318 KG		15914	

RETAINED
8170
KG
BYCATCH
DISCARDED
7745
KG
BYCATCH

B1

OCTOBER 17-21, 1976

OCTOBER 20		1020-1320		1445-1745														
SET OUT POSITION	38° 46' N	73° 04' W	38° 57' N	72° 58' W														
HAULBACK POSITION	38° 41' N	73° 04' W	38° 57' N	72° 53' W														
DEPTH-BEGIN/END	7470	7440	6410	6100														
SPECIES	AMOUNTS IN KILOGRAMS				TOTALS PAGE II & TOTALS PAGE I													
9	LOLIGO #4		20		20	RETAINED SPECIES												
10	#5	40	20	60	240 KG SQUID		+	8170 KG SQUID	=	8410 KG SQUID	PERCENTAGE SQUID: 51.8%							
11	ILLEX #1	50	50	100							(LOLIGO 58%) ILLEX 13%							
12	#2	30	30	60														
13	JONAH CRABS	20	12	32														
14	ANGLERFISH	4	5	9	59 KG BYCATCH	+	7745 KG BYCATCH	=	7804 KG BYCATCH	PERCENTAGE BYCATCH: 48.2%								
15	LOBSTER	10		10														
16	RED HAKE		8	8														
17																		
18																		
19																		
20	HAULBACK TOTALS	154 KG	145 KG															
21																		
22																		
23																		
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