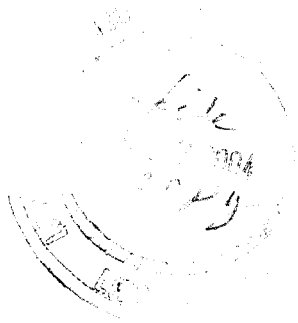
U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812



SEAMOUNT FISHERY
FOREIGN VESSEL OBSERVER REPORT, KITAKAMI MARU
(AUGUST 15 TO OCTOBER 1, 1981)

By

William B. Barnett, Observer
Southwest Fisheries Center Honolulu Laboratory
National Marine Fisheries Service, NOAA
Honolulu, Hawaii 96812

November 1981

SEAMOUNT FISHERY
FOREIGN VESSEL OBSERVER REPORT, KITAKAMI MARU
(AUGUST 15 TO OCTOBER 1, 1981)

By

William B. Barnett, Observer
Southwest Fisheries Center Honolulu Laboratory
National Marine Fisheries Service, NOAA
Honolulu, Hawaii 96812

In May of 1981 Nippon Suisan of Tobata, Japan, notified the Honolulu Laboratory, Southwest Fisheries Center, National Marine Fisheries Service, of their intention to send two trawlers to fish in the U.S. Fishery Conservation Zone (FCZ) on the Hancock Seamounts, located northwest of Midway Islands. The Aso Maru entered the FCZ in June; on board the vessel was U.S. Observer Nathaniel Shippen of the Honolulu Laboratory (see SWFC Admin. Rep. H-81-4). Over 400 tons of Japan's 1,000-ton quota of western Pacific seamount groundfish were taken by the Aso Maru in 9 days. The smaller Kitakami Maru, another veteran of the seamount trawl fishery, was then designated to take the balance of the 1981 allocation. It was requested that the observer for the Kitakami Maru board that ship in Japan to eliminate expensive running time to Midway from the fishing grounds. Departure date was set for August 3. The decision to wait until the latter part of the season was presumably based on catch rates in previous years, as well as on the success of the Aso Maru earlier this year. There may have been other factors such as scheduled maintenance and crew rotation after the winter season prawn fishery in the East China Sea. Whatever the reasons for waiting, by August and September the catch rates of armorhead and alfonsin had dropped drastically and resulted in only 244 tons of the remaining quota of 582 tons being caught. This season was perhaps the worst ever for the Japanese in this fishery, both inside and outside of the FCZ.

I boarded the Kitakami Maru on the morning of August 3, 1981 in Tobata, one of the five industrial cities which incorporate Kita-Kyushu, Japan. Tobata is also the original headquarters of Nippon Suisan and the same building still houses the large trawling department of that company. Our voyage began with the trip through Kanmon Straits and we proceeded almost due east for the seamounts. During the run we were slowed for 2 days by high winds from one of the frequent typhoons of that time of year; but the weather at the Hancock Seamount proved uniformly sunny and calm throughout the fishing period. The passage out provided me with the opportunity to get acquainted with the crew and with the ship (see Appendix Table 1 for vessel and gear specifications and vessel personnel list). The Captain, Mr. Tamura, and Radio Officer Mr. Izumi, both spoke English well and with their assistance, my sampling duties went routinely and my stay aboard was made very enjoyable. I only regret being unable to offer a suitable explanation for the dearth of fish on the seamounts. It quickly became apparent that daytime trawling would yield no fish on either seamount. Extensive surveys and trial hauls were conducted over every bit of trawlable bottom without success. The vessel frequently fished through the night and

into the morning hours without taking more than a few kilograms of fish, although on occasion a concentration of armorhead would show on the echo sounder and several tons per haul would be taken for a short time. Often during nights of poor catches the recorders showed patches of fish just above the seamount or out off the edges where the bottom trawl was ineffective. The captain and officers were all experienced trawl fishermen (this was Captain Tamura's sixth year on the seamounts) and the gear of the Kitakami Maru was essentially the same as in previous seasons. There was no immediately apparent cause for the decline in abundance or concentration of these fish. The total catch of the target, incidental, and other species is given in Table 1. The area of operation is shown in Table 2 and Figure 1. The trawl catch by species and area is given in Table 3, and catch per unit effort data by area and species are presented in Table 4.

TRAWLING PROCEDURES[1]

Standard convex rectangular steel doors, 2 × 3 m in size are used to spread the opening of the trawl. The footrope length is 40 m and the cod end mesh size 90 mm (see Appendix Figure 1).[2] The main trawl cable is 30 mm steel wire; warp is let out to a length that is 2.5 times the depth. The seamount is surveyed with sonar and echo sounder prior to setting the trawl. The trawl is then deployed on an approach to the seamount, with a net sonde monitoring the opening of the net.[3] On both "C" and "J" Banks the net was towed across the seamount two or more times during one haul. The doors were brought up to the stern posts during the turn and let out again as the return approach was made. "K" Bank is a small and very sharply pointed pinnacle and the navigational difficulties involved in hitting this bank squarely necessitated single passes of only 5 minutes of bottom time per haul. Hang-ups were infrequent, occurring at spots which the echo sounders and sonar confirmed to be rough and hard. On several occasions armorhead were found concentrated in these troublesome locations.

SAMPLING PROCEDURES

I arranged to be called on the intercom phone when each haul was coming up. This gave me time to go up to the bridge to note the specifics of depth, times, etc., and arrive on deck or in the factory as the catch was dumped. I used my own estimations of catch weight, and checked them against the figures kept in the ship's log. The ship's figures were calculated using the factory count of the number of 10.5-kg freezer trays sent to the flash freezer from each haul, and worked back to whole catch weight by applying product-recovery ratios of 60% for armorhead and large

---

[1]This has been discussed in reports by previous observers.

[2]Slides of the diagram used in constructing this net, and otter board specifications are on file at the Honolulu Laboratory, Foreign Vessel Observer Program (FVOP).

[3]Recorder paper from hauls made this season and copies of charts used by the Kitakami Maru are on file at the Honolulu Laboratory, FVOP.

Table 1.--Summary of total catch by species, Kitakami Maru.

Target Species

Common names	Pelagic armorhead, boarfish
Japanese name	Kusakari tsubodai
Scientific name	Pentaceros richardsoni Smith
Federal species code[1]	200
Product	Headed, gutted, and frozen in 21-kg cases
Season's catch, FCZ	208.5 metric tons (MT)
Total product	128 MT
Common name	Alfonsin
Japanese name	Kinmedai
Scientific names	Beryx splendens, B. decadactylus
Federal species code[1]	201
Product	Headed, gutted, and frozen in 21-kg cases
Season's catch, FCZ	15.7 MT
Total product	10.2 MT

Incidental Species
(Federal species code 499)[1]

Common name	Scientific names	Product
Mirror dory	Zenopsis nebulosa	Dressed, frozen (large only). Some consumed aboard.
(None)	Hyperoglyphe japonica	Dressed, frozen. Some consumed aboard.
(None)	H. japonica	Frozen whole in 21-kg cases.
(None)	Emmelichthyidae	Frozen whole in 21-kg cases.

Other Species

The remainder of the catch was waste species which were for the most part discarded. Individual crew members would dry flatfish in the rigging or save a handful of "red cod" for snacks. Miscellaneous species consumed probably totaled less than 50 kg for the trip.

Specimens of all incidental catch were photographed and frozen for systematic identification.

[1]See Federal Register 43(244):59301, Tuesday, December 19, 1978.

Table 2.--Area of operation.

Seamounts	Japanese designation	Position	
		Latitude N	Longitude E
Kinmei	"G" Bank	35°00'	171°45'
Milwaukee group	"F" Banks		
Yuryaku	"FC"	32°40'	172°15'
Kanmu	"FB"	32°15'	172°47'
South Kanmu	"FA"	32°02'	173°06'
Colahan	"E" Bank	31°00'	175°55'
Unnamed	"D" Bank	30°26'	177°28'
Fishery Conservation Zone			
Northwest Hancock	"C" Bank	30°16'	178°42'
Southeast Hancock	"J" Bank	29°48'	179°04'
Southeast Hancock	"K" Bank	29°40'	179°20'

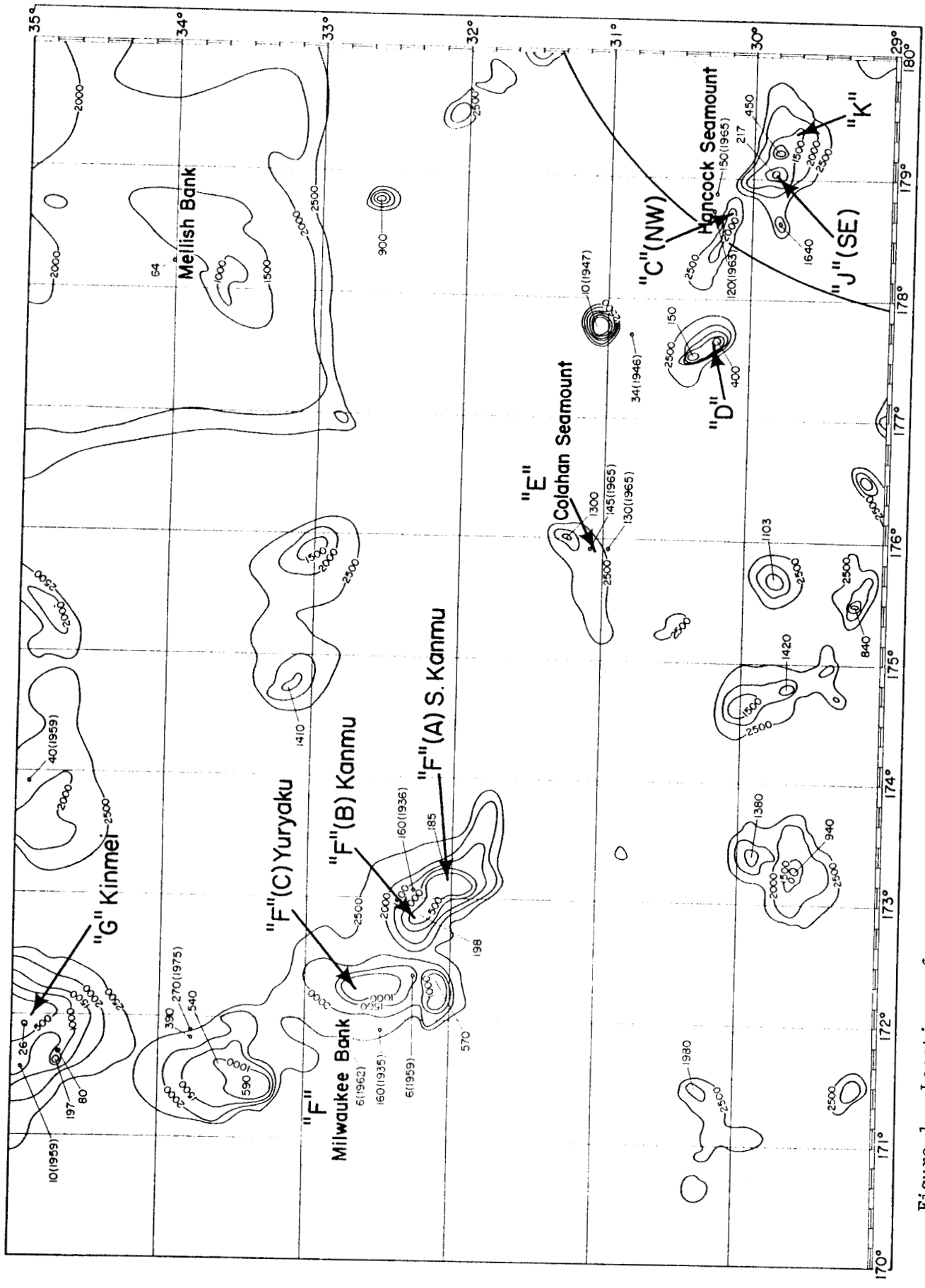


Figure 1.--Locations of seamounts and guyots northwest of the Northwestern Hawaiian Islands. Year of discovery is indicated for each guyot, and the 200-mile line is shown. Depths in fathoms.

Table 3.--Trawl catch by species and area (in metric tons).

Species	Northwest Hancock Seamount "C" Bank	Southeast Hancock Seamount "J" Bank	Southeast Hancock Seamount "K" Bank	All FCZ Banks
Armorhead	164.8	34.7	9.0	208.5
Alfonsin	5.8	8.6	3.6	18.0
Others[1]	8.7	7.3	1.3	17.3
Total	179.3	50.6	13.9	243.8

[1]Includes miscellaneous product as well as waste fish.

Table 4.--Catch per unit effort in kilograms/minute by area and species.

	Northwest Hancock Seamount "C" Bank	Southeast Hancock Seamount "J" Bank	Southeast Hancock Seamount "K" Bank	All FCZ Banks
Number of hauls	155	118	34	307
Total minutes trawling (includes turns off the seamount)	10,522	9,799	171	20,492
Armorhead				
Total catch (kg)	164,749	34,715	9,053	208,517
Kilograms/minute	15.66	3.54	52.94	10.18
Alfonsin				
Total catch (kg)	5,794	8,570	3,557	17,921
Kilograms/minute	0.55	0.87	20.80	0.87
Other species				
Total catch (kg)	8,739	7,248	1,330	17,316
Kilograms/minute	0.83	0.74	7.78	0.84
All species				
Total catch (kg)	179,331	50,593	13,940	243,864
Kilograms/minute	17.04	5.16	81.52	11.90

alfonsin, 50% for small alfonsin, and 100% for whole frozen fish. As there is no fish meal or oil facility on the Kitakami Maru, all heads, viscera, and waste fish are discarded. I felt that the ship's estimations of product/catch were very fair, and that basing catch volumes on factory figures (which are easily checked by the observer by simply counting the trays) is more accurate than "eyeballing" the gross catch either in the net or in the catch bin. While it would be difficult to quantify product recovery on specific individual fish, a daily or weekly check would be easy to arrange by weighing baskets of whole and processed fish during the season.

The single weakness noted in the ship's method of catch estimation was in estimating waste whole fish, which did not enter into product-recovery calculations. The crew shoveling waste fish into the discard conveyor or hoisting large sharks and rays overboard did not, to my knowledge, report any figures on these weights to the bridge. This is a fairly minor point considering the small proportion of unused catch on the seamounts.

Sampling for species composition, length, weight, and sex frequency was conducted by obtaining randomly chosen baskets of fish (15-30 kg per basket) as soon as the catch was dumped into the factory bin. On the second haul of each day and on other hauls of diverse species, these samples were sorted, counted, and weighed by species. On every haul, subsamples of approximately 30 fish were measured for fork length, and on at last one haul per day these fish were also individually weighed and sexed (Table 5). No otolith samples were taken.

Incidentally caught species were photographed and specimens frozen. Notes were kept on stomach contents, and armorhead were graded as to fat or lean body type. Very few extremely fat individuals were taken on the FCZ seamounts. As a result my original categories of "fat" and "lean" individuals seem to represent sex based differences rather than distinctly separate populations. It was only toward the end of the sampling period when we fished outside the FCZ that any really distinctly different groups were determined. In an attempt to quantify body "shape" of fat and lean armorhead, I marked each fish sampled as "+" or "-" in the margins of the length/weight/sex form, and tabulated grams body weight per millimeter fork length.

In addition, 50 fat and 50 lean specimens from each of three seamounts were brought back to the Honolulu Laboratory for further analysis.

REMARKS

Throughout the fishing period Northwest Hancock ("C" Bank) yielded consistently larger catches and larger individual fish than did Southeast Hancock ("J" Bank). "K" Bank on Southeast Hancock seemed to have larger fish than "J" Bank on the same seamount, although samples at "K" Bank were restricted by the comparatively few hauls made there. Alfonsin made up only 18% of the total catch, and thus equaled all other incidentals in

Table 5.--Summary of biological observations on armorheads and alfonsins.

	Northwest Hancock Seamount "C" Bank	Southeast Hancock Seamount "J" and "K" Banks	All FCZ Banks combined
Armorheads (Total number of fish sampled: 4,869)			
Average fork length (mm)	303	299	302 (range: 262-420)
Average weight (kg)	0.52	0.49	0.51 (range: 0.21-1.70)
Sex ratio (% male:% female)	46:54	39:61	43:57
Body type ratio (% fat:% lean)	67:33	61:39	60:40

	Northwest Hancock Seamount "C" Bank	Southeast Hancock Seamount "J" Bank	Southeast Hancock Seamount "K" Bank	All FCZ Banks combined
Alfonsins (Total number of fish sampled: 2,480; size range: 155-457 mm, 0.8-2.3 kg)				
Average fork length (mm)	275	188	316	
Large fish				321
Small fish				175
Average fish weight (kg)	0.62	0.22	0.74	
Large fish				0.61
Small fish				0.22
Sex ratio (% male:% female), large fish only				62:38

volume. By far most alfonsin were caught at "J" Bank, although the fish there were almost exclusively small and sexually immature. The few large alfonsin taken came from "C" and "K" Banks.

Because of poor catches, the Kitakami Maru replaced the Aso Maru and continued to fish for several weeks outside the FCZ before returning to Japan. I transferred to a Nippon Suisan cargo/supply ship on October 5 for my return to Honolulu via Dutch Harbor, Alaska. The entire cost of this unavoidable detour was paid for by Nippon Suisan.

I would again like to express my appreciation to the officers and crew of the Kitakami Maru and to the staff of Mr. M. Toriai, manager of the First Operations Section, Trawling Department, Nippon Suisan Kaisha, Ltd. of Tobata, Japan, for their generous hospitality.

ITINERARY

August 3 - Embarked on Kitakami Maru, port of Tobata, Japan

15 - Fishing began inside FCZ

October 1 - Fishing terminated inside FCZ

5 - Transferred to Nichiyo Maru (radio call sign: JHIG)

9 - Disembarked at Dutch Harbor, Alaska

11 - Arrived Honolulu

RECORDS

Daily trawl haul form
Length/weight/sex log
Radio report file
Scientist's log
Species composition from basket samples
Time and attendance form
Vessel sighting form

REFERENCES

Chikuni, Shiro.
1970. The "phantom fish," "Kusakari tsubodai" - An outline. Enyo (Far Seas) Fish. Res. Lab. 3:1-4. (Engl. transl. by J. H. Shohara, Natl. Mar. Fish. Serv., Terminal Island, CA 90731; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Japan Fisheries Agency.
1974. Survey of the North Pacific seamounts (Kita Taiheiyō kaizan chōsa). Report of Kaiyo Maru survey cruises, 1972 season, 136 p. (Engl. transl. of selected portions of the report by T. Otsu, 1981, 55 p., Transl. No. 54; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Japan Marine Fishery Resource Research Center (JAMARC).
1973. Surveys of trawling grounds in the north central Pacific Ocean, 1972 season (Showa 47-nendo kaigai torōru shingyojyo kigyōka chōsa hokokusho--Hokubu chūo Taiheiyō kaiiki). JAMARC Rep. 7, 89 p. (Engl. transl. of portions of the report by T. Otsu, 1977, 27 p., Transl. No. 19; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Sasaki, Takashi.
1978. The progress and present status of the seamount fishing ground development program (Kaizan gyojyō kaihatsu no keika to genjō). Bull. Jpn. Soc. Fish. Oceanogr. 33:51-53. (Engl. transl. by T. Otsu, 1979, 6 p., Transl. No. 35; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Appendix Table 1.--Vessel and gear specifications and personnel.

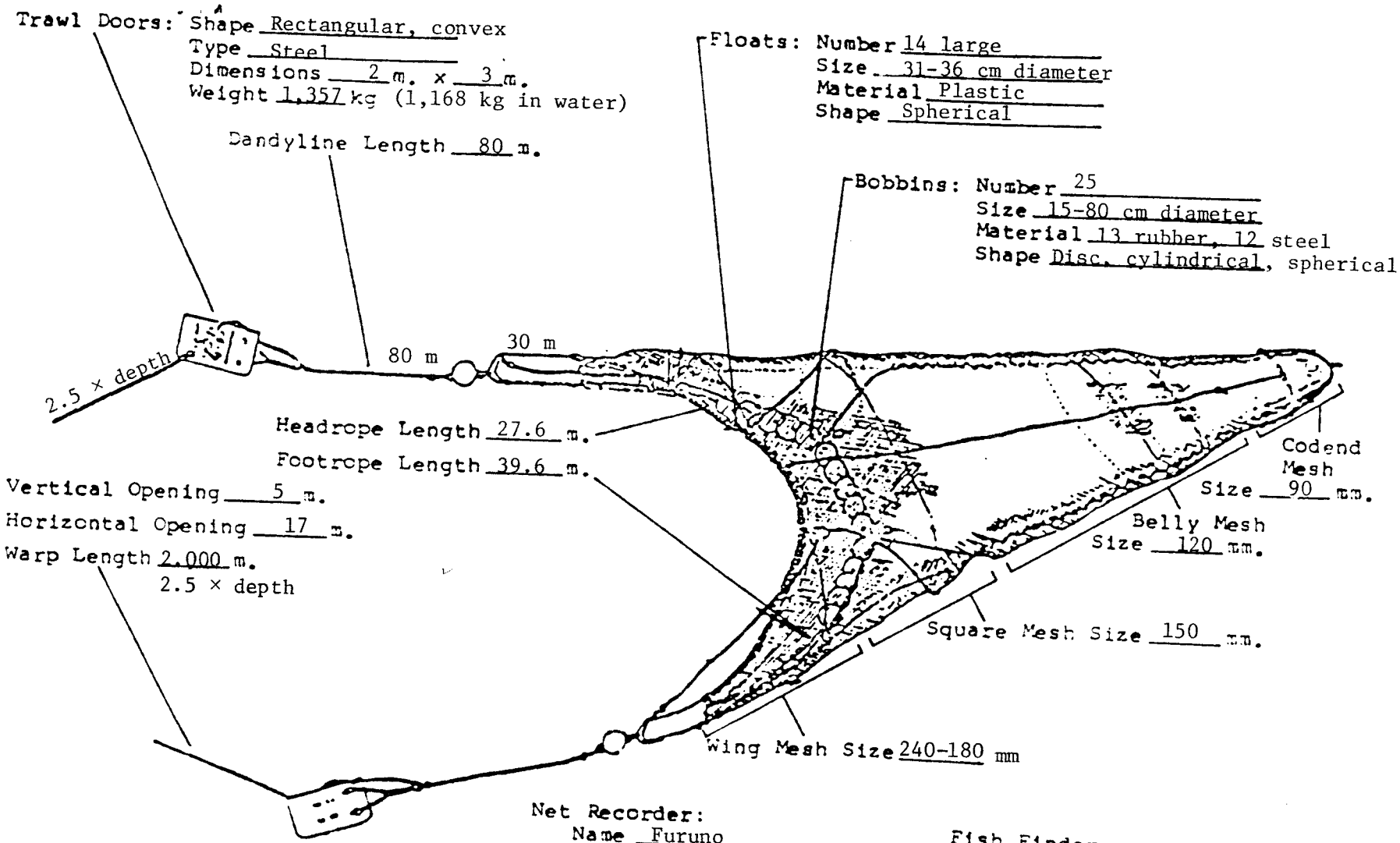
Vessel		
Permit number	JA-81-0321-B	
Length	56.6 m	
Gross tonnage	549.86 short tons	
Net tonnage	215.92 short tons	
Width	9.20 m	
Draft	3.80 m	
Engine type	Diesel, 6 cylinders	
Fuel consumption	3 kl/day fishing, 4 kl/day running	
Horsepower	1,500	
Hull number	100765	
Registration number	F01-132	
Company/owner	Nippon Suisan Kaisha, Ltd.	
Vessel type	Freezer-factory, independent stern trawler	
Year launched	1966	
Port of registry	Tokyo, Japan	
Home port	Tobata, Kita-Kyushu, Japan	
Radio call sign	JMLB	
Gear		
Net dimensions	(See Appendix Figure 1)	
Door measurements	2 × 3 m	
Main trawl winch	Electric, 180 kW	
Total wire on drum	2,000 m	
Flash freezer capacity	Approximately 3 tons	
Processing speed	Approximately 1.5 tons/hour	
Personnel (35 total ship complement)		Prior experience in seamount fishery
Captain	Mr. Tomiyasu Tamura	6 seasons
Radio Officer	Mr. Kazuo Izumi	None
Navigation Officers	3	3 seasons
Engineers	3	None
Galley	3	None
Oilers	4	?
Deck and processing crew	19	?

Appendix Figure 1.--Description of trawl gear used on the Kitakami Maru.

NET DIMENSIONS AND CHARACTERISTICS

Type of Vessel Japanese independent stern trawler

Observation Period August 3-October 5, 1981



Net Recorder:
Name Furuno
Model Number FNR 50
Frequency
Sound frequency: 200 kc/sec
Transmitting frequency: 50 kc/sec
Transmitting range: 2,000 m

Fish Finder:
Name JRC zoom echo sounder
Model Number NJA 330
Frequency 28, 75, and 200 kHz
Paper Type - Wet x Dry
Speed of Advance 12 mm/sec