



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
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SEAMOUNT FISHERY, FOREIGN VESSEL OBSERVER REPORT

KITAKAMI MARU (July 22-October 20, 1983)

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On July 22, 1983, I replaced Nathaniel T. Shippen as observer aboard the Japanese trawler Kitakami Maru (Table 1). We began fishing inside the Fishery Conservation Zone (FCZ) on July 23.

Table 1.--Vessel specifications and personnel, Kitakami Maru.

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Vessel Statistics

Radio call sign:	JMLB
Permit number:	JA-83-0321-A
Length:	56.62 m
Gross tonnage:	549.86
Net tonnage:	215.92
Width:	9.2 m
Draft:	3.8 m
Engine type:	Diesel
Horsepower	1500
Hull number:	100765
Registration number:	F01-132
Company-owner:	Nippon Suisan Kaisha, Ltd.
Vessel type:	Independent stern trawler
Year commissioned:	1966
Home port:	Tobata, Kita-Kyushu, Japan

Personnel

Captain	Kaname Taketsugu
Number of officers:	8
Number of crew:	19
Processing:	15
Total ship complement:	27
Experience in seamount fishery:	None

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Trawl Gear

See Figure 1 for dimensions. The net was modified by replacing two of the center bobbins opposite the cod end with two large cylinder-shaped bobbins composed of hard rubber. This reduced "hangups" by allowing the net to "bounce over small rocks and ledges.

Area of Operation

1. Outside of the U.S. Fishery Conservation Zone (FCZ).

See text.

Type of Vessel Independent stern trawler

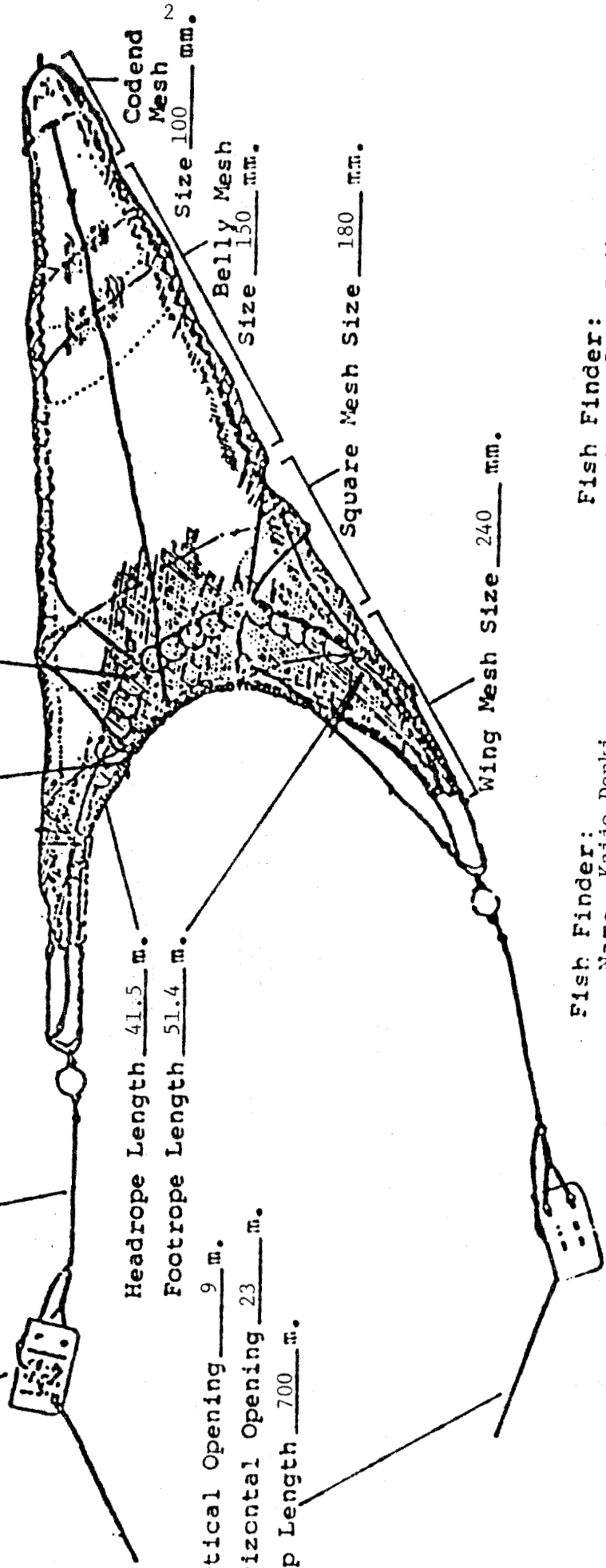
Observation Period July 22-October 20, 1983

Trawl Doors: Shape Rectangular  
Type Steel  
Dimensions 1.84 m. x 2.76 m.  
Weight 1,758 kg.

Dandyline Length 130 m.

Floater: Number 23  
Size 36 cm. diameter  
Material Plastic  
Shape Spherical

Bobbins: Number 23  
Size 53 cm. diameter  
Material 12 steel, 9 rubber  
Shape Spherical



Headrope Length 41.5 m.

Footrope Length 51.4 m.

Vertical Opening 9 m.

Horizontal Opening 23 m.

Warp Length 700 m.

Fish Finder: Name Kaijo Denki  
Model Number Wide size  
Frequency 24,75,200 Hz.  
Paper Type - Wet xx Dry  
Speed of Advance 3 ft./min.

Fish Finder: Name Japan Radio Corp.  
Model Number NJA-330  
Frequency 28,75,200 Hz.  
Paper Type - Wet xx Dry  
Speed of Advance 3 ft./min.

Net Recorder: Name Furuno  
Model Number FNR 100  
Frequency 50 Hz. (to ship)  
180 Hz. (to bottom)

Figure 1.--Net dimensions and characteristics

## 2. FCZ.

- a. Southeast Hancock Seamount (J Bank), lat. 29°43'-49'N, long. 179°02'-06'E
- b. Northwest Hancock Seamount (C Bank), lat. 30°15'-16'N, long. 178°42'-44'E
- c. K Bank, lat. 29°40'N, long. 179°20'E

## TRAWL RESULTS

Target Species

Common names: Pelagic armorhead, boarfish  
 Japanese name: Kusakari tsubodai  
 Scientific name: Pentaceros richardsoni  
 Species code: 080

Common name: Alfonsin  
 Japanese name: Kinmedai  
 Scientific name: Beryx splendens  
 Species code: 081

After the first couple of trawls at Northwest Hancock Seamount it became apparent that the catch rate had dropped significantly from the previous fishing period from June 9 to July 21.<sup>1</sup> During the first 4 days of fishing at Hancock, the total catch averaged less than 2 metric tons (MT) per day. Because of this low catch rate most of the time was spent fishing outside of the FCZ. I remained as an observer during this entire period from July 22, until we returned to Japan on October 8. Out of a total of 70 fishing days, 15 were spent inside of the FCZ. We reentered the FCZ on two additional occasions; from August 14 to 20 and from September 14 to 17. Average daily catch rate during these periods dropped to 1.5 and 1.0 MT, respectively.

At Southeast Hancock, over a period of 9 fishing days and 44 trawling stations, average time per haul was 124 min.<sup>2</sup> There were 23 trawls of 500 kg or less total catch with 11 trawls producing 0 catch. The remaining 6 days at Northwest Hancock yielded 29 trawls at an average of 119 min per haul. All but two trawls at Northwest Hancock were 500 kg or less and 17 trawls here produced 0 catch. A single trawl at K Bank lasted 10 min and generated zero catch.

<sup>1</sup>See Southwest Fisheries Center Honolulu Laboratory, National Marine Fisheries Service, NOAA, Honolulu, HI 96812, Admin. Rep. H-83-18, 7 p.

<sup>2</sup>Time per haul is the actual time the net was in the water and may include several passes over the seamount plus ship turn-around time. See Southwest Fisheries Center Honolulu Laboratory, National Marine Fisheries Service, NOAA, Honolulu, HI 96812, Admin. Rep. H-80-15, 13 p.

A total of 21,050 kg were caught inside the FCZ (Table 2). Armorhead accounted for 11,370 kg or 54%, while alfonsin comprised 1,225 kg (6%). Other species comprised the remaining 40% with a total weight of 8,455 kg (Table 3).

Table 2.--Catch per unit effort by area and species inside Fishery Conservation Zone.

	Southeast Hancock	Northwest Hancock	K Bank
No. hauls	44	29	1
Total minutes (trawl in water)	5,320	3,450	10
Armorhead			
Total catch (kg)	9,245	2,125	0
Kilogram/minute	1.74	0.62	
Alfonsin			
Total catch (kg)	150	1,075	0
Kilogram/minute	0.028	0.31	
Other species			
Total catch (kg)	6,555	1,900	0
Kilogram/minute	1.23	0.55	
All species			
Total catch (kg)	15,950	5,100	0
Kilogram/minute	3.00	1.48	

Table 3.--Trawl catches (in kilograms) by species in the Fishery Conservation Zone.

Species	Catch in kilograms
<u>Pentaceros richardsoni</u>	11,370
<u>Beryx splendens</u>	1,225
Others	8,455
<u>B. decadactylus</u>	
<u>Zenopsis nebulosus</u>	
<u>Emmelichthys struhsakeri</u>	
<u>Antigonia sp.</u>	
<u>Polymixia japonicus</u>	
<u>Macrorhamphosus spp.</u>	
<u>Priacanthus sp.</u>	
<u>Pseudanthias kelloggi</u>	
<u>Grammatonotus laysanus</u>	
<u>Hyperoglyphe japonica</u>	
Moridae	
Myctophidae	
Sternoptychidae	
Paralepididae	
<u>Ruvettus pretiosus</u>	
<u>Promethichthys prometheus</u>	
<u>Epinnula magistralis</u>	
<u>Ariomma lurida</u>	
<u>Setarches guentheri</u>	
<u>Peristedion engyceros</u>	
<u>Chascanopsetta prorigera</u>	
<u>Parabothus coarctatus</u>	
Echeneidae	
Tetraodontidae	
<u>Halietaea retifera</u>	
Pentaceridae	
<u>Decapterus tabl</u>	
<u>Scomber japonicus</u>	
<u>Holicolenus sp.</u>	
<u>Hexanchus griseus</u>	
<u>Prionace glauca</u>	
Carcharhinidae	
Squalidae	
<u>Etmopterus villosus</u>	
<u>Isistius brasiliensis</u>	
<u>Echinorhinus cookei</u>	
Urolophidae	
Dasyatidae	
Squids	

## SAMPLING RESULTS

1. Pelagic armorhead, Pentaceros richardsoni

Morphology: As in previous cruises pelagic armorhead was divided into three separate and distinct body types--fat, lean, and intermediate--based on difference in coloration, fat content, and body shape. It should be noted that there is often very close distinction between lean and intermediate types. Therefore, morphological data may vary between these two types depending on the interpretation of each observer as to what category an individual fish belongs in (Table 4).

Table 4.--Observations on armorhead, Pentaceros richardsoni.

## a. Southeast Hancock Seamount

Lean type 92%

Number measured: 649

Sex ratio: Male 227 (54%)  
Female 196 (46%)Average length: 300 mm Range: 253-336  
Average weight: 0.53 kg 0.29-0.75Fat type 2%

Number measured: 10

Sex ratio: Male 3 (33%)  
Female 6 (67%)Average length: 318 mm Range: 303-355  
Average weight: 0.91 kg 0.75-1.20Intermediate type 6%

Number measured: 48

Sex ratio: Male 5 (16%)  
Female 27 (84%)Average length: 315 mm Range: 275-336  
Average weight: 0.71 kg 0.55-0.82

## b. Northwest Hancock Seamount

Lean type 77%

Number measured: 261

Sex ratio: Male 76 (64%)  
 Female 43 (36%)

Average length: 304 mm Range: 265-334  
 Average weight: 0.56 kg 0.32-0.75

Fat type 8%

Number measured: 20

Sex ratio: Male 12 (71%)  
 Female 5 (29%)

Average length: 308 mm Range: 270-332  
 Average weight: 0.84 kg 0.57-0.98

Intermediate type 15%

Number measured: 40

Sex ratio: Male 9 (26%)  
 Female 25 (74%)

Average length: 313 mm Range: 276-343  
 Average weight: 0.66 kg 0.48-0.92

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## 2. Alfonsin, Beryx splendens

Morphology: Alfonsin was not sampled at Southeast Hancock owing to the low catch rate there. Reliable sampling results were only obtained at Northwest Hancock. Alfonsin here seemed to fall into two distinct size groups. The most prevalent type was the small (15-20 cm) size category. This type made up about 80% of the total catch. Large alfonsin (30-40 cm) made up the remainder of the catch and was occasionally found in sizable numbers relative to the other species caught. Intermediate size alfonsin seemed to be almost completely absent from the seamounts (Table 5).

### Other commercial species:

Other species caught in significant quantities and utilized as product included Emmelichthys struhsakeri, Ariomma lurida, and Hyperoglyphe japonica. Emmelichthys struhsakeri was the most prevalent of the other species often comprising over 50% of the total catch in a single haul. Whole fish were placed in trays and frozen. Large H. japonica were usually headed, gutted, and frozen individually, while A. lurida was dressed and frozen in trays. Small quantities of Scomber japonicus and Decapterus tabl were caught and utilized by the galley. Zenopsis nebulosa was also caught in significant quantities but were seldom used as product. A total of about 17 sharks (3,200 kg) and 4 rays (600 kg) were caught inside the FCZ. These sharks and rays, in addition to all other incidental species caught, were not utilized by the vessel in any manner (Table 6).



Table 5.--Observations on alfonsins, Beryx splendens.

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Northwest Hancock Seamount

Small type

Number measured: 75

Sex ratio: All immature

Average length: 166 mm      Range: 155-190  
Average weight: 0.13 kg      0.10-0.21

Large type

Number measured: 50

Sex ratio: Male      34 (68%)  
              Female      16 (32%)

Average length: 329 mm      Range: 213-442  
Average weight: 1.18 kg      0.29-2.50

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Table 6.--Species products.

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Pelagic armorhead

Frozen fish (headed and gutted)      4.9 MT  
Fish meal and oil      0

Alfonsin

Frozen whole or headed and gutted      0.6 MT  
Fish meal and oil      0

Other species

Frozen whole or headed and gutted      2.1 MT  
Fish meal and oil      0

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## State of Maturation

During the sampling period from mid-July through September the vast majority of lean and intermediate armorhead were well into the developing stage of maturation. Many appeared sexually advanced indicating that spawning was imminent. Several ovaries were found in what seemed to be a spent condition, giving evidence that spawning may have recently taken place. Samples of each ovary were saved for later examination in the

laboratory. In the field they were grouped into five separate categories based on external physical characteristics. Later microscope examination will be necessary to confirm the field observations.

Generally, a greater percentage of the intermediate type armorhead were sexually mature than the other types. In addition nearly all of the fat types were immature and were practically the only immature ovaries encountered.

Alfonsins less than 20 cm were immature. The majority of those greater than 30 cm were ripe (hydrated) (Table 7).

Table 7.--State of maturation.

Armorhead	Lean	Intermediate	Fat
Southeast Hancock Seamount			
Advanced:	73 39%	Advanced: 15 52%	Immature: 6 100%
Developing:	77 41%	Developing: 14 48%	
Immature:	3 2%		
Spent:	34 18%		
Northwest Hancock Seamount			
Advanced:	18 42%	Advanced: 12 44%	Immature: 3 60%
Developing:	20 46%	Developing: 14 52%	Developing: 1 20%
Spent:	5 12%	Spent: 1 4%	Ripe: 1 20%
<u>Alfonsin</u>			
Large type			
Ripe:	11 69%		
Developing:	2 12%		
Spent:	3 19%		

#### Activity Outside of the FCZ

Since the majority of time that I was on board was spent fishing outside of the FCZ included here is a brief description of the various seamounts northwest of Hancock that were exploited during this period. A total of 346 fishing stations were conducted outside of the FCZ.

#### G Bank

G Bank includes three separate bank areas: G-R plus G-B, and G-A to the northwest. G-R Bank located at lat. 34°56'N, long. 171°48'E was the only area where trawling operations were conducted within the G-Bank

series. The catch there was predominately small alfonsin (15-25 cm FL) often comprising as much as 95% of the total catch. Other species caught incidentally to alfonsin were Squalus blainvillei, Helicolenus sp., and very large Z. nebulosa. Armorhead was occasionally caught in extremely small quantities. Trawls at G-R Bank were conducted 24 h a day, with the best catches during daylight hours. A total of about 550-600 MT were caught over a period of 36 fishing days. Unfortunately, much of the alfonsin was too small to be used as product.

#### F Bank

Includes F-A, F-B, and F-C Banks. A total of 6 fishing days were spent at F-B Bank, which is located at lat. 32°15'N, long. 175°44'E. The first few trawls yielded catches of up to 20 MT of large (30 cm and up) alfonsin. However, the catch rate dropped off quickly within the next couple of days and very few armorhead were caught here. Judging from the fathometer tracings, the bottom appeared to be very rough with a depth between 400 and 450 m. Although the total bank area was fairly large, only about one-fourth of this area was trawlable. Accordingly, there was a lot of net hangups here. Total catch was about 75 MT, nearly all alfonsin. A few trawls were attempted at F-A and F-C Bank over 2 fishing days. These regularly resulted in severe net hangups and zero catch.

#### E Bank

Seven fishing days were spent trawling at E Bank, located at lat. 31°01'N, long. 175°53'E. Approximately 20 MT comprised of mostly small alfonsin and Z. nebulosa were caught here. With the exception of one 4 MT trawl, very few armorhead were taken.

#### D Bank

A total of 5 fishing days were spent at D Bank located at lat. 30°21'N, long. 178°26'E, just outside of the FCZ. Only about 1.0 MT was caught, largely due to the small trawlable area and rough bottom which produced many net hangups. Single trawls were usually less than 100 kg and were comprised of Z. nebulosa with a few armorhead.

#### ITINERARY

July 13	- Departed Honolulu
July 14	- Arrived Tokyo, Japan
July 16	- Departed Tokyo via cargo vessel <u>Bering Maru</u>
July 22	- Arrived fishing grounds; transferred to <u>Kitakami Maru</u>
July 23	- Entered FCZ; began sampling
September 17	- Ceased fishing in FCZ
September 28	- Transit to Tobata, Japan
October 8	- Arrived Tobata, Japan
October 20	- Arrived Honolulu

## RECORDS

The following records were kept:

Scientists log  
Daily trawl haul form  
Species composition from basket samples  
Size-frequency log

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