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SEAMOUNT FISHERY, FOREIGN VESSEL OBSERVER REPORT  
RYUYO MARU NO. 2 (APRIL 22-JUNE 3, 1978)

By

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Table 1.--Trawl catches in metric tons by species and area.

Species	Area	
	Hawaii-FCZ 80	Outside
Armorhead	407.1	24.8
Alfonsin	3.7	14.3
Others:	5.6	4.4
	<u>Erythrocles schlegeli</u>	
	<u>Antigonia eos</u>	
	<u>Chlorophthalmus oblongus</u>	
	<u>Ariomma lurida</u>	
	<u>Zeus nebulosa</u>	
	<u>Macrorhamphosus gracilis</u>	
	<u>Polymixia japonica</u>	
	<u>Priacanthus boops</u>	
	<u>Grammatonotus laysanus</u>	
	<u>Hollardia goslinei</u>	
	<u>Decapterus russelli</u>	
	<u>Collybus drachme</u>	
	<u>Scomber japonicus</u>	
	<u>Chascanopsetta prorigera</u>	
	<u>Promethichthys prometheus</u>	
	<u>Ruvettus pretiosus</u>	
	<u>Etmopterus villosus</u>	
	<u>Squalus fernandinus</u>	
	Moridae	
	Coryphaenoididae	
	Congridae	
Total	416.4	43.5

Note: Checklist incomplete, pending identification of specimens.

Table 2.--Catch-per-unit-effort by species and area.

Area	No. hauls	Total min.	Armorhead		Alfonsin		Others		All species	
			Total catch (kg)	Kg/min	Total catch (kg)	Kg/min	Total catch (kg)	Kg/min	Total catch (kg)	Kg/min
SE Hancock	62	1,662	228,800	137.66	2,400	1.44	3,800	2.29	235,000	141.39
NW Hancock	39	335	178,300	532.23	1,300	3.88	1,800	5.37	181,400	541.49
30°22'N 177°33'-35'E	4	20	100	5.00	0	--	0	--	100	5.00
Colahan	30	375	24,200	64.53	10,400	27.73	300	0.80	34,900	93.07
Kanmu	7	120	0	--	400	3.33	0	--	400	3.33
Kinmei	<u>6</u>	<u>310</u>	<u>100</u>	0.32	<u>3,500</u>	11.29	<u>4,100</u>	13.22	<u>7,700</u>	24.84
Total	<sup>1</sup> 148	2,822	431,500		18,000		10,000		459,500	

<sup>1</sup>First seven tows omitted. Total catch 400 kg armorhead.

Table 3.--Size range of alfonsin caught by area.

Area	Haul No.	Sample size	Size range (cm)	Average length (cm)
SE Hancock	20	72	15.4-23.2	20.26
NW Hancock	48	40	27.0-37.5	32.18
	50	27	15.5-24.3	18.70
	53	20	27.3-39.8	--
	64	66	16.4-22.0	19.17
Colahan	89	80	15.3-23.5	19.57
	195	100	16.2-23.6	20.95
	131	100	15.0-21.2	16.68
	139	90	15.3-22.0	18.78
Kinmei	154	100	15.5-33.0	27.47

The Ryuyo Maru No. 2 was chartered by the Japan Marine Fishery Resource Research Center (JAMARC) to survey the seamount resources, particularly those of southeast and northwest Hancock which lie within the contiguous fishery zone of the United States. This charter was the second survey conducted by JAMARC to assess the central North Pacific seamounts.

JAMARC is a semi-governmental organization that operates with funds provided half by the Japanese Government and half by the fishing industry to develop and promote existing and latent fishery resources. JAMARC's research covers both the scientific and commercial aspects of fisheries.

#### Vessel Statistics

Permit No.: JA-78-0330	Vessel type: Independent stern trawler
Length: 91.6 m	Width: 15.5 m      Draft: 6.5 m
Gross tonnage: 2,961.07	Net tonnage: 1,501.27
Engine type: Diesel	Horsepower: 4,000
Hull No.: 100883	Registration No.: TK 1-837
Year commissioned: 1967	Radio call sign: JGYV
Company: Hokaido Gyogyokosha	
Home port: Tokyo Harbor	

#### Personnel

Captain: Osamu Mishima	No. officers: 10
	No. crew: 40
	Engineers: 6
	Galley: 4
	Deck and processing: 30

Observer for JAMARC: Yutaka Niimi  
Total ship complement: 52  
Experience in seamount fishery: No prior experience

#### Trawl Gear

See attachment 1 for dimensions. The net was modified by replacing the center bobbins with used car tires to reduce "hangups."

#### Operations

<u>Seamounts trawled</u>	<u>Lat.</u>	<u>Long.</u>
Hawaii-FCZ 80:		
SE Hancock	29°43'-49'N	179°02'-06'E
NW Hancock	30°15'-16'N	178°42'-44'E
Seamount at	30°22'N	177°33'-35'E
Colahan	31°00'-02'N	175°54'-55'E
Kanmu	32°14'-15'N	172°44'-52'E
Kinmei	35°12'-28'N	171°26'-31'E

Target Species

Common names: Pelagic armorhead, kusakari tsubodai  
 Scientific name: Pentaceros richardsoni  
 Species code: 080

Common names: Alfonsin, kinmedai  
 Scientific name: Beryx splendens  
 Species code: 081

## TRAWL RESULTS

The general fishing strategy involved the use of two fish finders to locate concentrations of fish over suitable trawling grounds. In most instances, the trawl set was commenced prior to contact with the seamount. During trawl operations the net recorder was monitored continuously for depth of trawl, "hangups," and density of fish entering the net. Trawling was generally conducted on the bottom or within a few meters off the bottom.

The net was fished for an average of 26.8 min/tow on SE Hancock and 8.6 min/tow on NW Hancock. Hauls on seamount at lat. 30°22'N, long. 177°33'-35'E averaged 5 min/tow; Colahan, 12.5 min/tow; Kanmu, 17.1 min/tow; and Kinmei, 51.7 min/tow.

Of the total 459.9 metric tons (MT) of fish caught during the survey, 431.9 MT, or 94% consisted of pelagic armorhead (Table 1). Alfonsin comprised 18.0 MT or 4% of the catch. Other fishes of diverse species were taken in small quantities (Table 2). Of the total catch, 90% (416.4 MT) was caught within the FCZ.

The largest single catch inside of the FCZ was 38.7 MT. Of the 101 trawl tows on the Hancock seamounts, 32 produced catches greater than 3 MT and 41 hauls resulted in catches below 3 MT. There were 28 zero catch hauls.

Night hauls accounted for 90% of the armorhead catch in the FCZ. Sixty-nine percent of the total catch was caught between 1800 and 2359 h, 21% between 0000 and 0559 h, 8% between 0600-1159 h, and 2% between 1200 and 1759 h.

The first 4 days of trawling on SE and NW Hancock produced 82% (340.5 MT) of the total catch from the Hancock seamounts. Because of the steady decline in catches, 4 days were spent trawling outside of the FCZ. The CPUE remained poor even after the "cooling off period." The largest single catch outside of the FCZ was 10.8 MT. Of the 54 tows conducted, 26 hauls resulted in catches below 3 MT and 24 hauls produced zero catches.

## SAMPLING RESULTS

## A. Pelagic armorhead

## 1. Morphology

Pelagic armorheads caught consisted of two body forms: "fat" and "lean" types. Because of the possibility that the two body types may have ecological significances, they were recorded separately.

## a. Hancock seamounts

The average catch composition was 98% "lean" type.

## "Lean" type:

No. measured: 1,625

Sex ratio: Females 301--61%

Males 190--39%

Average length 29.3 cm. Size range 25.0-34.0 cm.

Average weight 0.38 kg.

## "Fat" type:

No. measured: 81

Sex ratio: Females 31--57%

Males 23--43%

Average length 30.2 cm. Size range 27.2-33.2 cm.

Average weight 0.65 kg.

Number of otoliths taken: 62. Size range 24-34 cm.

## b. Colahan seamounts

The average catch composition was 63% "lean" type.

## "Lean" type:

No. measured: 256

Average length 30.3 cm. Size range 27.6-33.8 cm

Average weight 0.52 kg.

## "Fat" type:

No. measured: 151

Average length 31.3 cm. Size range 27.2-34.3 cm.

Average weight 0.69 kg.

Number of otoliths taken: 6. Size range 27-33 cm.

## c. Kinmei seamounts

Only "lean" type armorhead was caught on this seamount.

No. measured: 22

Average length: 35 cm. Size range 29.5-38.2 cm.

Average weight: 0.69 kg.

Number of otoliths taken: 13. Size range 29.5-38.2 cm

## 2. Food and feeding habit

The principal food items found in the stomach contents of armorhead caught on the seamounts were: copepods, amphipods, euphausiids, shrimps, salps, myctophids, and small fishes. Stomach volume and condition of contents suggest that feeding took place only during the day and that feeding peaks occurred in the morning and late afternoon.

## 3. Gonad condition

Gross examination of ovaries indicated that the majority of females were in the early developing stage of maturation.

## B. Alfonsin

Alfonsin was taken incidental to pelagic armorhead and generally made up only a small portion of the total catch (Table 2). This species was caught in only 29 of the 155 hauls conducted during the survey. The largest haul of 7.3 MT was made on Colahan seamount. Only two hauls on Hancock produced catches greater than 400 kg.

The sizes of alfonsin caught appear to vary from location to location (Table 3). Because of the variation in sizes and limited sampling, no analysis was conducted. The data, although limited, suggest that the trawl was selectively catching small alfonsin.

A total of 109 otoliths was extracted from 14.1 to 49.5 cm fish for aging.

- C. Approximately 300 g of black coral, Antipathes sp., and 500 g of bamboo coral, Keratoisis nuda, were dredged up while trawling on Kinmei seamount. No precious coral was found on Hancock.



## SHIPBOARD PRODUCTS Hancock seamounts

## A. Species product

1. Pelagic armorhead	Frozen fish (headed and gutted)	246.7 MT
	Fish meal and oil	--

## a. Frozen fish

The body of the "lean" type armorhead averaged 58% of total fish weight after hand processing (heading and gutting). Recovery of machine cut fish was estimated at 50% of total fish weight.

The body of "fat" type armorhead averaged 63% of total fish weight after hand processing.

2. Alfonsin	Frozen whole	2.0 MT
	Fish meal and oil	--
3. Others	Frozen whole	3.7 MT
	Fish meal and oil	--

## B. By-products

Reduction of raw product (head, viscera, and whole fish) was estimated at 164.0 MT, for fish meal, 43.155 MT, and oil, 45.5 kl or a ratio of approximately 3.8:1:1, for the total catch. The daily reduction could not be determined because of "carry-over" in raw product from the previous day's catch.

## ITINERARY

Departed Honolulu	April 19, 1978 (1315)
Arrived in Japan	April 20 (1600) +19 h
Aboard vessel	April 22
Port of departure	Tokyo Harbor
Departed	April 22 (1500)
Date sampling began	May 1, 1978
Date sampling ended	May 27, 1978
Total No. days sampled	27
Port of return	Chiba, Japan
Date of return	June 3, 1978 (1000)
Departed Japan	June 10, 1978 (2200)
Arrived in Honolulu	June 10, 1978 (0945)

RECORDS

The following records were kept:

Daily Trawl Haul Form  
Size Frequency Log  
Production Log

OBSERVER

Thomas K. Kazama - National Marine Fisheries Service, Honolulu  
Laboratory

Net Dimensions And Characteristics

RYURO MARU #2

Vessel Type Independent Stern Trawler

Observation Period April 22 to June 3, 1978  
Trawling period May 2 to 21

Trawl Doors: Shape Rectangle  
Type Concave  
Dimensions 4.3 m. x 2.7 m.  
Weight 4167 kg

Floats: Number 36  
Size 36 cm.  
Material Plastic  
Shape Round

Dandyline Length 150 m.

Bobbins: Number 10  
Size 54 cm  
Material Steel  
Shape Round

Center bobbins: 104 car tires  
Size 58 cm.  
Material Rubber

Headrope Length 46 m.

Footrope Length 59.4 m.

Vertical Opening 6 m.

Horizontal Opening 14 m.

Warp Length 1200 m.

Codend Mesh Size 90 mm

Belly Mesh Size 50 mm.  
Changed to 90 mm.  
5/11

Square Mesh Size 50 mm.  
90

Wing Mesh Size 240 mm.

Fish Finder

Name Furuno  
Model Number FTG 422A  
Frequency 28 & 50 kHz

Net Recorder

Name Furuno  
Model Number FNR-200 Mark II  
Frequency AC 100V 60 kHz.

