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第5 銀龍丸によるアリューシャン水域における  
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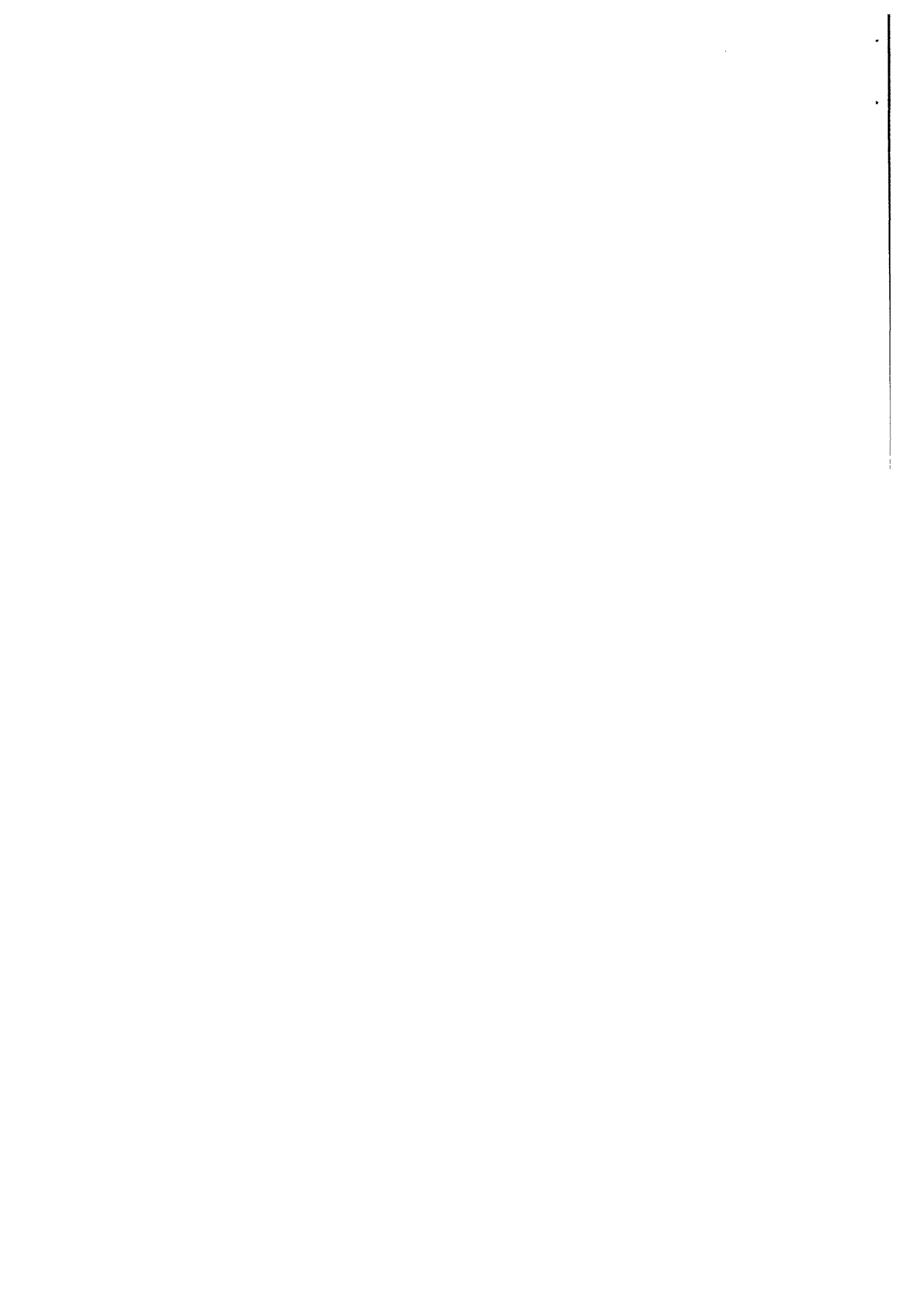
**Preliminary report on the Japan-U. S. cooperative groundfish  
surveys in the Aleutian region by Ginryu maru No. 5 in 1986**

水戸啓一  
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1986年 9月  
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水産庁  
Fisheries Agency of Japan

この文書を引用する場合は下記による：

水戸啓一．1986．第5 銀龍丸によるアリューシャン水域における1986年度日米共同底魚資源調査速報．13頁．（第33回INPFC定例年次会議提出文書．1986年10月．米国，アンカレッジ市）．水産庁，遠洋水産研究所．日本．〒424 清水市折戸5-7-1.



# 第5銀龍丸によるアリューシャン水域における 1986年度日米共同底魚資源調査速報

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1986年度の水産庁による北洋底魚資源調査は、北転型スターン・トロール漁船第5銀龍丸を用船し、5～9月の期間、アリューシャン水域において、日米共同調査として実施されている。本報告は、5～7月に行われた第1次調査の概要を速報的にまとめたものである。

## 1. 調査の概要

日米共同底魚資源調査は、底魚類の資源量を推定することを主な目的として、1979年から、東部ベーリング海、アリューシャン水域及びアラスカ湾で実施されている。1986年の共同調査は、1980年と1983年に続く、アリューシャン水域における第3回目の調査である。

調査海域は東経170度から西経165度までのアリューシャン列島周辺であり、これはSouthwest strata, Southeast strata, Northwest strata, Northeast strata, Bowers Ridge strata及びSouthern Bering Sea strataの6海区に分けられている(図1)。そして、各海区は2～3のSubstrataに細分され、さらに、1～100 m, 101～200 m, 201～300 m, 301～500 m及び501～1,000 mの5つの水深帯に区分されている。これらの水深帯ごとに、過去の調査で得られた主要魚種の資源量に対応させて、曳網回数が設定された。

各曳網点では、30分間の曳網を実施し、漁獲物を魚種または魚種グループごとに分け、バネ秤で重量を測定して、漁獲物の重量組成を求めた。漁獲量が約5 t以上の場合には、漁獲物の一部を抽出して、標本の重量組成から、全体の組成を推定した。主要魚種については、約50～200尾を無作為抽出して、雌雄別に分け、体長を測定した。魚種別の漁獲尾数は標本の平均体重から推定するか、あるいは直接数えることによって求めた。さらに、主要魚種の体長-体重関係の測定、年齢形質などの採集を行った。

また、2回の曳網に1回の割合でXBTによる底水温の測定を行った。

音響機器を用いて、曳網中の網口幅の広がり測定を試みたが、明瞭な結果は得られなかった。

資源量を推定するための曳網以外に、マダラとキタノホッケの標識放流を行うため、これらが多量に漁獲された海域で5～20分間の曳網を行った。捕獲された魚を、甲板上に設置した水そうに一時収容し、活力のあるものを選び、体長を測定して、放流した。

## 2. 乗船調査員

調査作業には常に以下に示す3名の調査員と約20名の乗組員が従事した。

水戸啓一（遠洋水産研究所）

吉村祐一（東京水産大学）

Lael Ronholt（Northwest and Alaska Fisheries Center, Seattle）

5月14日から6月13日の期間

Ronald Payne（同上）

6月13日から7月14日の期間

## 3. 調査船及び漁具

第5銀龍丸は総トン数349.72tの北転型スターン・トロール漁船で、1979年以降の日米共同底魚資源調査に従事した調査船とほぼ同型である。第5銀龍丸の要目を表1に、使用した漁具及び付属漁具の仕様を表2に示した。

## 4. 調査日程

第5銀龍丸は1986年5月14日釧路を出港し、5月19日から6月3日まで（日本時間）、Southwest strataを西から東へ調査を進めた。続いて、6月4日から7日までNorthwest strataの東側で、さらに6月7日から10日までNortheast strataで調査を行った後に、燃油の補給と米国の科学者の交代のため、6月13日にダッチ・ハーバーに入港した。同日、ダッチ・ハーバーを出港し、再びNortheast strataにもどり、6月15日から7月8日まで西から東へ調査を進めた。そして、7月8日から10日までSouthern Bering Sea strataで調査を行い、7月14日にセワードに入港して第1次調査を終了した。

第5銀龍丸は7月20日にセワードを出港し、8月現在、米国調査船*Let's Go*と共にアリューシャン水域において調査中である。

## 5. 調査結果の概要

第1次調査では、49日間に173回の曳網を行った。これらのうち、標識放流のための曳網は16回、他は資源量推定のための曳網であった。失敗網を除くと、曳網回数はSouthwest strataで51回、Northwest strataで16回、Northeast strataで73回、Southern Bering Sea strataで9回、合計149回であった。Southwest strataとNortheast strataでは、水深100m以浅を除き、ほぼ予定した曳網を完了した。水深100m以浅の水深帯は米国の距岸3海里以内に含まれたり、海底が荒いため、予定された曳網回数を十分に消化できなかった。

主要魚種の海区别水深帯別30分曳網当りの漁獲量を表3に示した。Northwest strataとSouth-

ern Bering Sea strata での曳網は予定回数の一部だけであった。Southwest strata では、水深 1～100 m 帯でキタノホッケ、101～200 m 帯でキタノホッケ、キタノメヌケ及びスケトウダラ、201～300 m 帯でアラスカメヌケとドスイカ、301～500 m 帯でアラメヌケ、501～1,000 m 帯でムネダラが卓越していた。Northeast strata では、1～100 m の水深帯でマダラ、101～200 m 帯でスケトウダラ、キタノホッケ及びマダラ、201～300 m 帯でスケトウダラとアラスカメヌケ、301～500 m 帯でアラスカアブラガレイ、501～1,000 m 帯でムネダラが卓越した。

1980 年と 1983 年のアリューシャン水域における日米共同底魚資源調査の前半の調査結果は、60 分曳網当りの漁獲量として、山口(1980)と手島(1983)によってそれぞれ報告されている。これらを 30 分曳網当りの漁獲量に換算して、Southwest strata と Northeast strata について、今回の調査結果と比較した(表 4)。調査時期は 1980 年と 1983 年が 7～8 月で、今回より 1～2 か月遅かった。使用したトロール網のヘッド・ロープとフット・ロープの長さは、1980 年にはそれぞれ 30.8 m と 44.0 m、1983 年には 46.9 m と 58.0 m であり、今回の調査では 1980 年と 1983 年の中間の長さであった。主要魚種の 30 分曳網当たりの漁獲量は、ヒレグロメヌケを除き、いずれの魚種でも 1986 年に最も多くなっていた。特に、アラスカアブラカレイ、アラスカメヌケ、キタノメヌケ、アラスカメヌケは、他の調査年に比べ著しく多く漁獲された。

各曳網点におけるオヒョウの 30 分曳網当りの漁獲尾数を図 2 に示した。東経 174～175 度に分布密度の高い曳網点が集中していた。また、海区别水深帯別のオヒョウの体長組成を表 5 に示した。Southwest strata の水深 101～200 m 帯では 41～45 cm、201～300 m 帯では 51～55 cm にモードがみられた。Northeast strata の 101～200 m 帯では体長 61～80 cm の個体が多く、Northeast strata のほうが Southwest strata に比べ大型であった。

#### References cited

- Teshima, K. 1983. Preliminary report on the Japan-U.S. cooperative groundfish surveys in the Aleutian Region by Daito maru No.38 in 1983. 16p. Fisheries Agency of Japan, Tokyo, Japan (Document submitted to the International North Pacific Fisheries Commission).
- Yamaguchi, H. 1980. Preliminary report on the Japan-U.S. cooperative groundfish survey in the Aleutian Region by Hatsue maru No.62 in 1980. 20p. Fisheries Agency of Japan, Tokyo, Japan (Document submitted to the International North Pacific Fisheries Commission).

Table 1. Specifications of the research vessel Ginryu maru No.5 conducting the Japan-U.S. cooperative groundfish survey in the Aleutian Region in 1986.

Overall length (m)	55.30
Gross tonnage (ton)	349.72
Shaft horsepower (PS)	3,000
Propeller	Controllable pitched propeller
Type of trawl	Stern trawl
Number of crew	25
Number of scientists	3

Table 2. Specifications of trawl gears used for the 1986 survey.

Head rope length (m)	38.4
Footrope length (m)	54.0
Overall net length (m)	83.65 <sup>a</sup>
Mesh size of codend (mm)	120 <sup>b</sup>
Diameter of bobbins (mm)	520
Diameter of tires (mm)	800
Dandyline length (m)	114 <sup>c</sup>
Size of otterdoor (m x m)	2.25 x 3.5 <sup>d</sup>
Weight of otterdoor in water (kg)	2,900

a including codend (20 m in length)

b double-layered

c otter pendant (12 m) + joining wire (2 m)

+ single dandyline (50 m) + double dandyline (50 m)

d width x height

Table 3(1). Average catch per unit effort (kg/30 min. trawled) of major species, by area and depth zone, sampled by Ginryu maru No.5 during the Japan-U.S. cooperative groundfish survey in the Aleutian Region in May-July of 1986.

Southwest Strata					
Depth zone (m)	001/100	101/200	201/300	301/500	501/1000
Number of hauls	4	27	7	7	6
Rock sole	115.0	56.5	13.1	-	-
Flathead sole	14.8	21.3	8.1	0.2	-
Greenland turbot	-	0.2	2.6	58.3	52.9
Arrowtooth flounder	5.1	14.1	270.9	301.1	71.4
Pacific halibut	12.7	16.1	26.2	40.5	4.1
Rex sole	-	12.6	55.7	8.3	-
Dover sole	-	-	0.1	0.2	0.6
Deepsea sole	-	-	-	-	0.8
Sub-total	147.6	120.8	376.7	408.6	129.8
Pacific cod	686.7	374.9	146.8	20.4	-
Walleye pollock	72.6	889.7	327.5	0.5	1.1
Sub-total	759.3	1,264.6	474.3	20.9	1.1
Sablefish	-	-	11.7	49.7	116.2
Pacific ocean perch	1.9	213.7	1,575.9	2.4	-
Northern rockfish	479.7	985.2	64.9	-	-
Shortraker rockfish	-	0.4	1.6	67.5	41.8
Rougheye rockfish	2.7	136.0	19.3	1,483.7	1.5
Dusky rockfish	-	-	-	-	-
Other rockfishes	-	0.1	-	-	-
Shortspine thornyhead	-	0.2	24.0	93.4	61.8
Other thornyheads	-	-	0.2	0.2	0.3
Pacific herring	-	-	-	-	-
Atka mackerel	12,370.7	1,803.2	16.7	-	-
Greenlings	0.4	-	-	-	-
Sculpins	446.0	64.5	27.7	9.7	0.8
Poachers	0.3	0.4	1.3	0.3	0.0
Eelpouts	-	-	0.0	0.1	4.1
Snailfishes	-	0.0	0.7	0.2	0.8
Giant grenadier	-	-	-	7.9	716.6
<u>Coryphaenoides cinereus</u>	-	-	-	-	56.5
Other rattails	-	-	-	-	0.2
Molas	-	-	-	-	1.8
Searcher	0.8	6.8	0.7	0.1	-
Prowfish	1.0	60.5	4.4	-	-
Skates	0.4	50.6	41.9	13.4	2.3
Other fishes	-	0.1	-	5.8	-
Sub-total	13,303.9	3,321.7	1,791.0	1,734.4	1,004.7
Total of fishes	14,210.8	4,707.1	2,642.0	2,163.9	1,135.6
Octopus	-	1.4	0.5	0.7	0.0
Squids	-	0.0	1,043.3	28.4	2.5
Pink shrimp	-	-	-	-	-
Sidestripe shrimp	-	-	-	-	-
Other shrimps	-	0.0	-	-	0.1
Sub-total	-	1.4	1,043.8	29.1	2.6
Total catch	14,210.8	4,708.5	3,685.8	2,193.0	1,138.2
Halibut (Number)	4.8	9.7	10.3	5.6	0.5

Table 3(2). Continued.

Northwest Strata					
Depth zone (m)	001/100	101/200	201/300	301/500	501/1000
Number of hauls	4	4	3	1	4
Rock sole	44.5	29.5	100.8	39.0	-
Flathead sole	-	-	-	-	-
Greenland turbot	-	-	9.5	45.0	37.3
Arrowtooth flounder	-	0.1	82.4	50.5	19.5
Pacific halibut	29.8	74.5	68.1	628.3	-
Rex sole	-	-	22.5	2.0	14.1
Dover sole	-	-	-	-	1.8
Deepsea sole	-	-	-	-	-
Sub-total	74.3	104.1	283.3	764.8	72.7
Pacific cod	4.3	331.0	254.6	-	-
Walleye pollock	162.0	2,026.9	317.2	-	-
Sub-total	166.3	2,357.9	571.8	-	-
Sablefish	-	-	-	-	34.1
Pacific ocean perch	-	0.1	3,771.2	11.5	-
Northern rockfish	-	0.1	-	-	-
Shortraker rockfish	-	-	-	9.3	11.9
Rougheye rockfish	-	-	26.8	2.6	11.8
Dusky rockfish	-	-	-	-	-
Other rockfishes	-	-	-	-	-
Shortspine thornyhead	-	-	-	0.6	34.0
Other thornyheads	-	-	-	-	-
Pacific herring	-	-	-	-	-
Atka mackerel	9.9	0.1	-	-	-
Greenlings	-	-	-	-	-
Sculpins	66.8	13.4	35.1	0.4	-
Poachers	0.2	0.1	0.4	0.4	-
Eelpouts	-	-	-	3.3	11.6
Snailfishes	1.0	-	0.3	-	0.9
Giant grenadier	-	-	-	-	1,153.5
<u>Coryphaenoides cinereus</u>	-	-	-	-	34.7
Other rattails	-	-	-	-	-
Molas	-	-	-	-	1.4
Searcher	0.1	0.1	0.0	-	-
Prowfish	-	-	-	-	-
Skates	0.2	2.3	35.7	37.3	5.6
Other fishes	-	-	-	-	9.4
Sub-total	78.2	16.2	3,869.5	65.4	1,308.9
Total of fishes	318.8	2,478.2	4,724.6	830.2	1,381.6
Octopus	-	0.0	-	-	0.1
Squids	-	0.0	6.8	137.0	12.4
Pink shrimp	-	0.1	0.1	-	-
Sidestripe shrimp	-	-	-	-	-
Other shrimps	0.1	-	-	-	-
Sub-total	0.1	0.1	6.9	137.0	12.5
Total catch	318.9	2,478.3	4,731.5	967.2	1,394.1
Halibut (Number)	5.5	7.8	6.7	54.0	-



Table 3(3). Continued.

Northeast Strata					
Depth zone (m)	001/100	101/200	201/300	301/500	501/1000
Number of hauls	3	26	14	13	17
Rock sole	7.5	85.6	25.4	3.4	-
Flathead sole	-	22.9	2.4	5.4	0.6
Greenland turbot	-	-	6.0	385.9	440.0
Arrowtooth flounder	-	67.6	95.4	1,410.5	169.3
Pacific halibut	3.2	67.1	23.2	53.7	11.7
Rex sole	-	0.7	5.3	10.7	-
Dover sole	-	0.0	-	0.6	9.2
Deepsea sole	-	-	-	-	-
Sub-total	10.7	243.9	157.7	1,870.2	630.8
Pacific cod	165.7	1,123.9	183.9	14.5	-
Walleye pollock	-	2,072.3	4,037.6	148.8	1.0
Sub-total	165.7	3,196.2	4,221.5	163.3	1.0
Sablefish	-	0.2	56.2	394.7	380.3
Pacific ocean perch	-	722.6	3,250.7	385.1	-
Northern rockfish	-	491.2	4.4	0.2	-
Shortraker rockfish	-	1.3	7.6	94.5	17.9
Rougheye rockfish	-	4.6	146.2	84.3	0.3
Dusky rockfish	-	0.2	0.1	-	-
Other rockfishes	-	-	-	-	-
Shortspine thornyhead	-	-	0.3	27.2	45.3
Other thornyheads	-	-	-	-	0.0
Pacific herring	-	-	-	-	-
Atka mackerel	0.1	1,401.6	10.4	0.2	0.7
Greenlings	2.6	-	-	-	-
Sculpins	26.5	124.6	82.8	17.5	0.6
Poachers	-	0.4	0.3	0.1	0.0
Eelpouts	-	-	-	2.6	5.0
Snailfishes	-	0.1	0.3	1.2	1.2
Giant grenadier	-	-	-	282.0	2,011.2
<u>Coryphaenoides cinereus</u>	-	-	-	2.5	57.1
Other rattails	-	-	-	-	-
Molas	-	0.0	0.2	0.0	0.4
Searcher	-	0.4	0.1	-	-
Prowfish	-	46.8	15.2	-	-
Skates	3.2	23.8	67.0	61.1	15.5
Other fishes	-	-	0.1	6.1	48.8
Sub-total	32.4	2,817.8	3,641.9	1,359.3	2,584.3
Total of fishes	208.8	6,257.9	8,021.1	3,392.8	3,216.1
Octopus	-	0.5	0.5	0.0	0.1
Squids	-	0.5	6.8	210.6	19.5
Pink shrimp	-	0.0	0.0	-	-
Sidestripe shrimp	-	-	-	-	-
Other shrimps	-	0.0	0.0	0.0	0.0
Sub-total	-	1.0	7.3	210.6	19.6
Total catch	208.8	6,258.9	8,028.4	3,603.4	3,235.7
Halibut (Number)	2.3	9.0	2.6	4.3	0.5

Table 3(4). Continued.

Southern Bering Sea					
Depth zone(m)	001/100	101/200	201/300	301/500	501/1000
Number of hauls	0	2	1	2	4
Rock sole		0.8	4.8	1.4	-
Flathead sole		-	1.0	37.3	-
Greenland turbot		-	-	1,672.9	434.0
Arrowtooth flounder		13.9	54.0	695.5	361.7
Pacific halibut		48.9	37.5	4.4	-
Rex sole		-	7.2	16.0	1.7
Dover sole		-	-	-	-
Deepsea sole		-	-	-	-
Sub-total		63.6	104.5	2,427.5	797.4
Pacific cod		69.0	192.0	12.4	-
Walleye pollock		7.4	1,562.4	111.3	3.1
Sub-total		76.4	1,754.4	123.7	3.1
Sablefish		-	-	1,040.5	374.5
Pacific ocean perch		67.7	3,219.5	0.6	-
Northern rockfish		460.5	-	-	-
Shortraker rockfish		3.8	-	52.0	8.4
Rougheye rockfish		71.5	13.5	74.0	3.9
Dusky rockfish		3.7	-	-	-
Other rockfishes		0.3	-	-	-
Shortspine thornyhead		-	-	13.3	16.6
Other thornyheads		-	-	-	-
Pacific herring		-	-	0.8	-
Atka mackerel		1.0	1.2	-	-
Greenlings		-	-	-	-
Sculpins		5.7	17.5	7.3	1.0
Poachers		-	-	0.1	0.0
Eelpouts		-	-	0.2	41.3
Snailfishes		-	0.1	0.2	0.2
Giant grenadier		-	-	-	41.0
<u>Coryphaenoides cinereus</u>		-	-	-	1.6
Other rattails		-	-	-	-
Molas		-	-	-	-
Searcher		0.1	-	-	-
Prowfish		10.2	5.5	-	-
Skates		6.3	9.5	5.2	17.9
Other fishes		-	-	161.5	0.1
Sub-total		630.8	3,266.8	1,355.7	506.5
Total of fishes		770.8	5,125.7	3,906.9	1,307.0
Octopus		-	-	-	-
Squids		-	1.1	76.1	10.5
Pink shrimp		-	-	-	-
Sidestripe shrimp		-	-	0.1	-
Other shrimps		0.1	-	-	0.1
Sub-total		0.1	1.1	76.2	10.6
Total catch		770.9	5,126.8	3,983.1	1,317.6
Halibut (Number)		6.0	2.0	1.5	-

Table 4(1). Average catch per unit effort (kg/30 min. trawled) of major species, by area and depth zone, sampled during the 1980, 1983 and 1986 Japan-U.S. cooperative groundfish survey in the Aleutian Region.

Species	Depth zone(m)	Southwest strata			Northeast strata		
		1980	1983	1986	1980*	1983	1986
Rock sole	1 - 100	-	30.2	115.0	50.1	2.4	7.5
	101 - 200	45.7	8.7	56.5	41.9	27.4	85.6
	201 - 300	18.4	0.9	13.1	15.1	20.0	25.4
	301 - 500	0.7	0.1	0.0	2.4	0.0	3.4
	501 -	0.3	0.0	0.0	0.5	0.0	0.0
Flathead sole	1 - 100	-	3.6	14.8	3.1	0.0	0.0
	101 - 200	4.8	2.1	21.3	8.7	0.0	22.9
	201 - 300	3.6	1.0	8.1	0.9	0.0	2.4
	301 - 500	0.4	0.1	0.2	0.3	2.0	5.4
	501 -	0.0	0.3	0.0	0.0	0.0	0.6
Greenland turbot	1 - 100	-	0.0	0.0	0.0	0.0	0.0
	101 - 200	0.0	0.2	0.2	1.5	0.7	0.0
	201 - 300	0.2	1.9	2.6	3.8	1.7	6.0
	301 - 500	12.3	13.5	58.3	45.6	175.1	385.9
	501 -	47.8	8.9	52.9	283.9	236.2	440.0
Arrowtooth flounder	1 - 100	-	5.0	5.1	25.8	0.0	0.0
	101 - 200	14.7	13.6	14.1	50.9	13.7	67.6
	201 - 300	11.6	12.6	270.9	77.4	9.8	95.4
	301 - 500	38.4	14.5	301.1	85.1	171.2	1,410.5
	501 -	26.2	11.6	71.4	26.5	31.3	169.3
Pacific halibut	1 - 100	-	7.0	12.7	5.3	78.0	3.2
	101 - 200	2.5	3.2	16.1	16.0	31.6	67.1
	201 - 300	1.2	2.1	26.2	11.0	31.5	23.2
	301 - 500	0.5	1.2	40.5	6.5	8.8	53.7
	501 -	0.0	0.0	4.1	0.0	1.5	11.7
Pacific cod	1 - 100	-	291.8	686.7	203.4	3,339.6	165.7
	101 - 200	40.5	160.2	374.9	353.5	83.5	1,123.9
	201 - 300	29.4	22.7	146.8	56.5	81.4	183.9
	301 - 500	0.2	0.0	20.4	6.7	8.2	14.5
	501 -	0.0	0.0	0.0	0.0	0.0	0.0
Walleye pollock	1 - 100	-	169.5	72.6	1,158.7	39.3	0.0
	101 - 200	427.5	527.2	889.7	186.4	2,147.6	2,072.3
	201 - 300	339.0	1,357.8	327.5	435.1	416.5	4,037.6
	301 - 500	1.3	7.7	0.5	117.5	3.6	148.8
	501 -	0.8	0.5	1.1	0.4	0.1	1.0
Sablefish	1 - 100	-	0.0	0.0	0.0	0.0	0.0
	101 - 200	0.0	0.0	0.0	113.2	68.4	0.2
	201 - 300	0.0	0.0	11.7	109.9	115.5	56.2
	301 - 500	2.0	4.0	49.7	19.3	50.8	394.7
	501 -	12.2	29.0	116.2	56.1	312.9	380.3
Pacific ocean perch	1 - 100	-	0.1	1.9	3.6	0.0	0.0
	101 - 200	271.2	458.0	213.7	107.4	233.2	722.6
	201 - 300	75.1	287.9	1,575.9	202.0	300.4	3,250.7
	301 - 500	5.7	2.3	2.4	19.2	70.9	385.1
	501 -	0.2	0.0	0.0	0.3	0.0	0.0
Northern rockfish	1 - 100	-	411.9	479.7	3.3	145.6	0.0
	101 - 200	4.3	198.4	985.2	16.5	81.2	491.2
	201 - 300	4.8	12.1	64.9	0.6	0.0	4.4
	301 - 500	0.1	12.1	0.0	0.5	0.0	0.2
	501 -	0.0	0.0	0.0	0.4	0.0	0.0

Table 4(2). Continued.

Species	Depth zone (m)	Southwest strata			Northeast strata		
		1980	1983	1986	1980*	1983	1986
Shortraker rockfish	1 - 100	-	1.4	0.0	0.0	0.0	0.0
	101 - 200	0.1	0.3	0.4	0.1	0.0	1.3
	201 - 300	0.6	0.4	1.6	8.8	0.0	7.6
	301 - 500	23.4	224.2	67.5	38.4	226.1	94.5
	501 -	3.9	13.6	41.8	1.2	10.1	17.9
Rougheye rockfish	1 - 100	-	2.8	2.7	0.0	0.0	0.0
	101 - 200	6.1	54.5	136.0	0.9	7.6	4.6
	201 - 300	12.9	39.5	19.3	4.1	12.9	146.2
	301 - 500	26.5	22.9	1,483.7	159.2	125.5	84.3
	501 -	2.1	1.2	1.5	1.5	0.9	0.3
Thornyheads	1 - 100	-	1.2	0.0	0.0	0.0	0.0
	101 - 200	0.4	0.2	0.2	0.1	0.6	0.0
	201 - 300	3.6	2.7	24.2	0.5	0.0	0.3
	301 - 500	33.0	27.2	93.6	2.0	17.9	27.2
	501 -	61.4	55.6	62.1	10.7	25.1	45.3
Atka mackerel	1 - 100	-	815.8	12,370.7	245.2	7,053.5	0.1
	101 - 200	25.1	1,486.3	1,803.2	498.2	17.2	1,401.6
	201 - 300	1.9	108.4	16.7	5.1	22.6	10.4
	301 - 500	0.1	8.5	0.0	1.2	0.0	0.2
	501 -	0.0	0.0	0.0	0.0	0.0	0.7
Rattails	1 - 100	-	0.0	0.0	0.0	0.0	0.0
	101 - 200	0.0	0.0	0.0	0.0	0.0	0.0
	201 - 300	0.0	0.0	0.0	0.0	0.0	0.0
	301 - 500	73.6	0.0	7.9	44.5	160.1	284.5
	501 -	208.4	888.8	773.3	896.3	575.6	2,068.2
Squids	1 - 100	-	1.8	0.0	0.6	0.0	0.0
	101 - 200	12.9	9.1	0.0	2.4	0.4	0.5
	201 - 300	329.7	312.8	1,043.3	13.3	1.8	6.8
	301 - 500	28.8	64.6	28.4	29.4	14.9	210.6
	501 -	11.7	14.0	2.5	9.0	11.8	19.5

\* Including the Southern Bering Sea strata

Table 5. Length frequency distributions of Pacific halibut by area and depth zone, sampled by Ginryu maru No.5 during the Japan-U.S. cooperative groundfish survey in the Aleutian Region in May-July of 1986.

Area	Southwest						Northwest					Northeast					Southern Bering Sea				Grand Total		
	1-100	101-200	201-300	301-500	501-1000	Total	1-100	101-200	201-300	301-500	Total	1-100	101-200	201-300	301-500	501-1000	Total	101-200	201-300	301-500	Total	Number	%
Depth zone (m)																							
FL class (cm)																							
26-30	5	13				18	1				1	1					1					20	2.3
35	2	10				12					2	2					2					14	1.6
40	2	28		2		32					1		1		1		3					35	4.0
45	3	74		13		90	1				1		2		1		3					94	10.7
50	4	49	16	6		75	2				2		7				7			1	1	85	9.7
55	1	27	23	1		52	5				5	12	1	2		15	3			3	75	8.6	
60	1	20	15	1		37	1	1			2	2	18	3	2	25					64	7.3	
65		10	5		2	17	2	4	1	2	9	31	8			39	1			1	66	7.5	
70		5	3			8	4	5	1	5	15	1	33	5	3	2	44			1	1	68	7.8
75		8	2	1		11	1	3	1	6	11	31	3	3		37	1		1	2	61	7.0	
80		4	2	1		7		3	4	4	11	28	3	9		40	2			2	60	6.8	
85		3	3	1		7	1	2	5	5	13	13	2	3	1	19	1			1	40	4.6	
90		4	1			5		4	1	7	12	21	2	4		27	1			1	45	5.1	
95		2	1	1		4	1	2	2	4	9	2	1	2		5					18	2.1	
100		1	1	2		4	1	1	1	3	5	7	1	5	1	14					23	2.6	
105				2		2		1	1	5	7	5	2	4		11					20	2.3	
110				1		1		1	1	5	7	8	1	2		11					19	2.2	
115		1		4	1	6	1	1	2	2	6	6	1	5	1	13	2	2		4	29	3.3	
120				1		1				3	3	1	1	4		6	1			1	11	1.3	
125												1		1		2					2	0.2	
130				1		1		1		1	2				2	1	3					6	0.7
135							1				1	1				1					2	0.2	
140	1					1		1			1	2				2					4	0.5	
145				1		1		1	1		2	1		1		2					5	0.6	
150										1	1			1		1					2	0.2	
155							1	1													1	0.1	
160													1			1					1	0.1	
165														1		1					2	0.2	
170															1	1					1	0.1	
175																							
180																							
185															1	1					1	0.1	
190													1			1					1	0.1	
195																							
200																							
215												1				1					1	0.1	
Total	19	259	72	39	3	392	22	31	20	54	127	7	234	36	55	8	340	12	2	3	17	876	

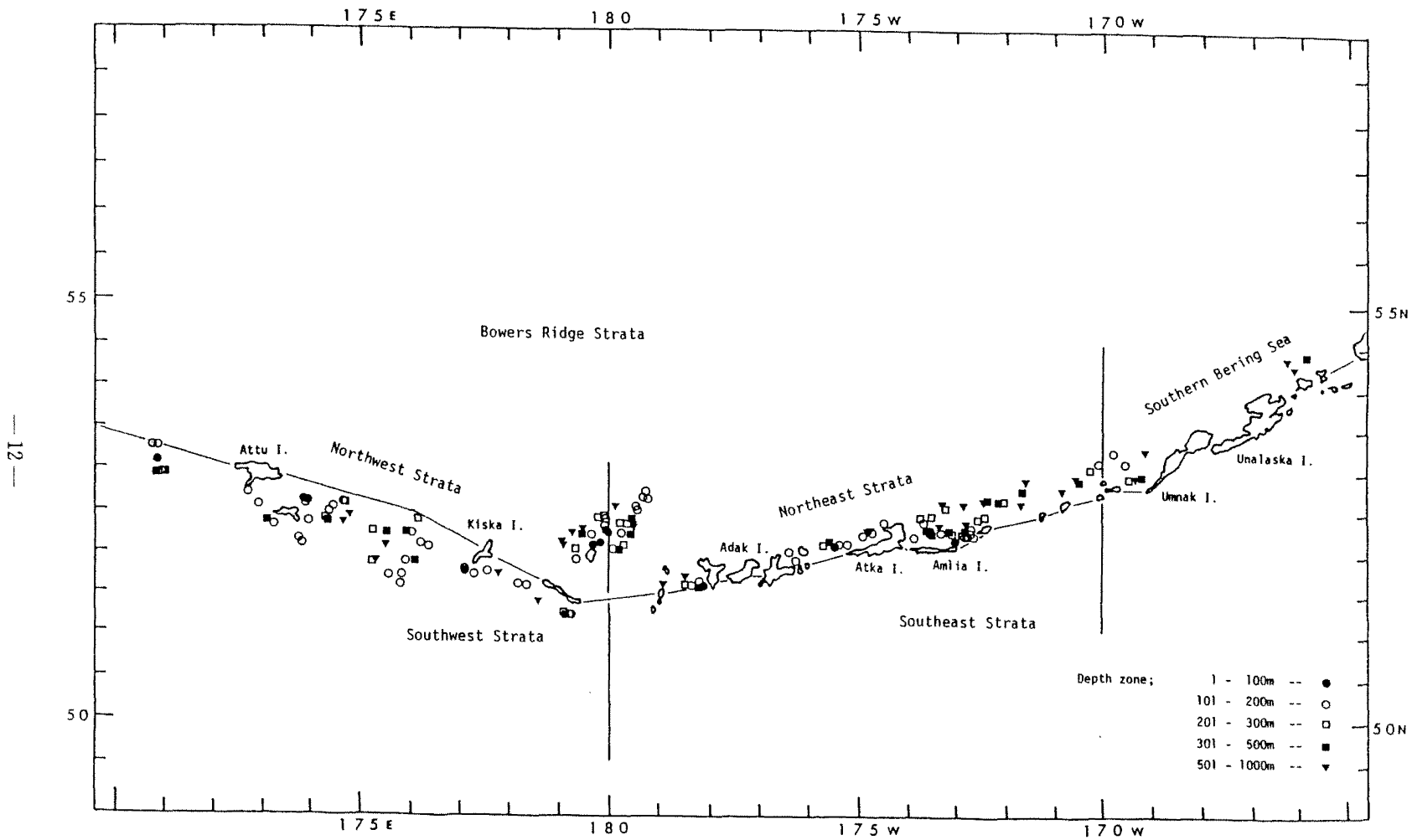


Fig. 1. Location of the sampling stations surveyed by Ginryu Maru No.5 during the Japan-U.S. cooperative groundfish survey in the Aleutian Region in May-July of 1986.

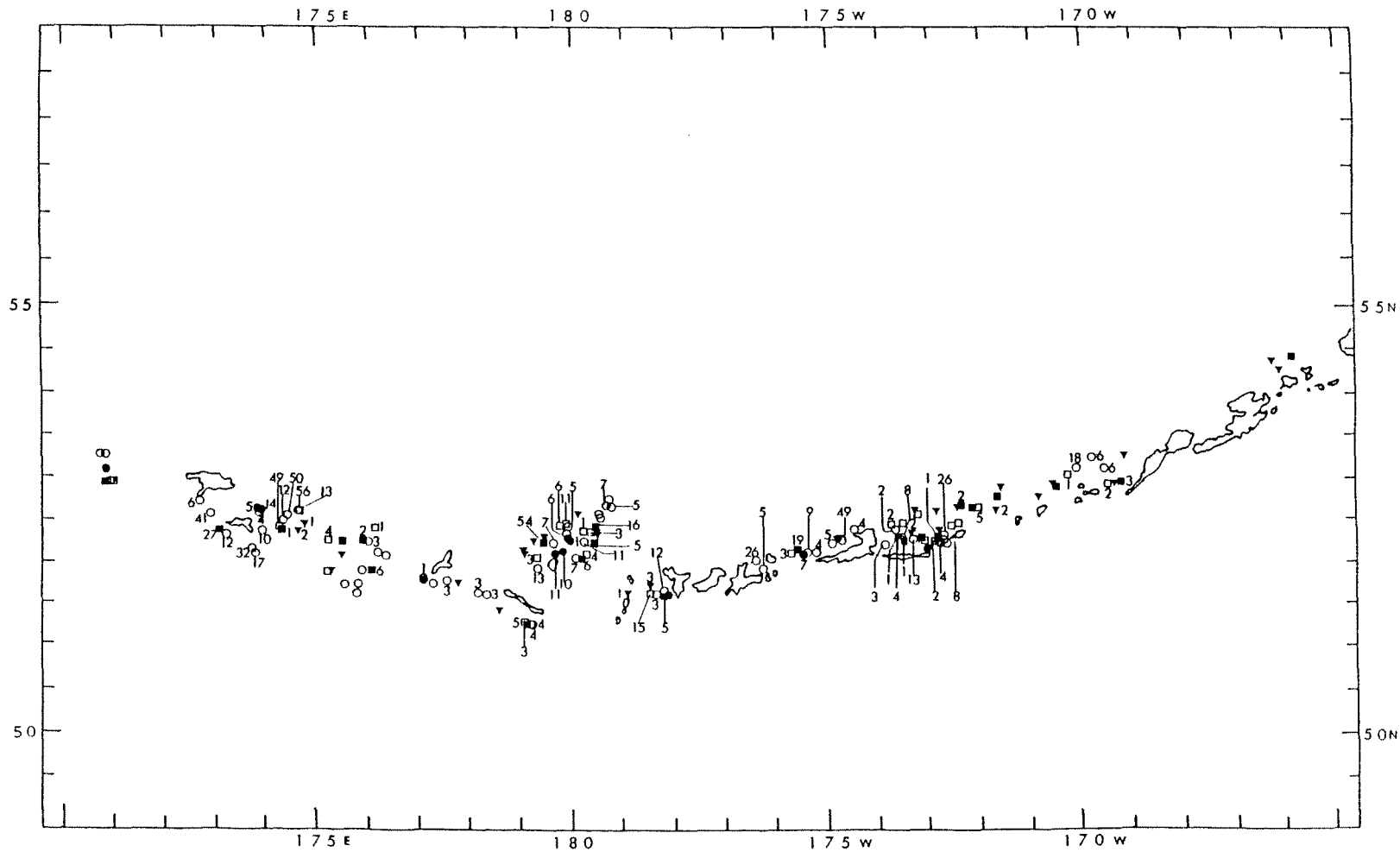
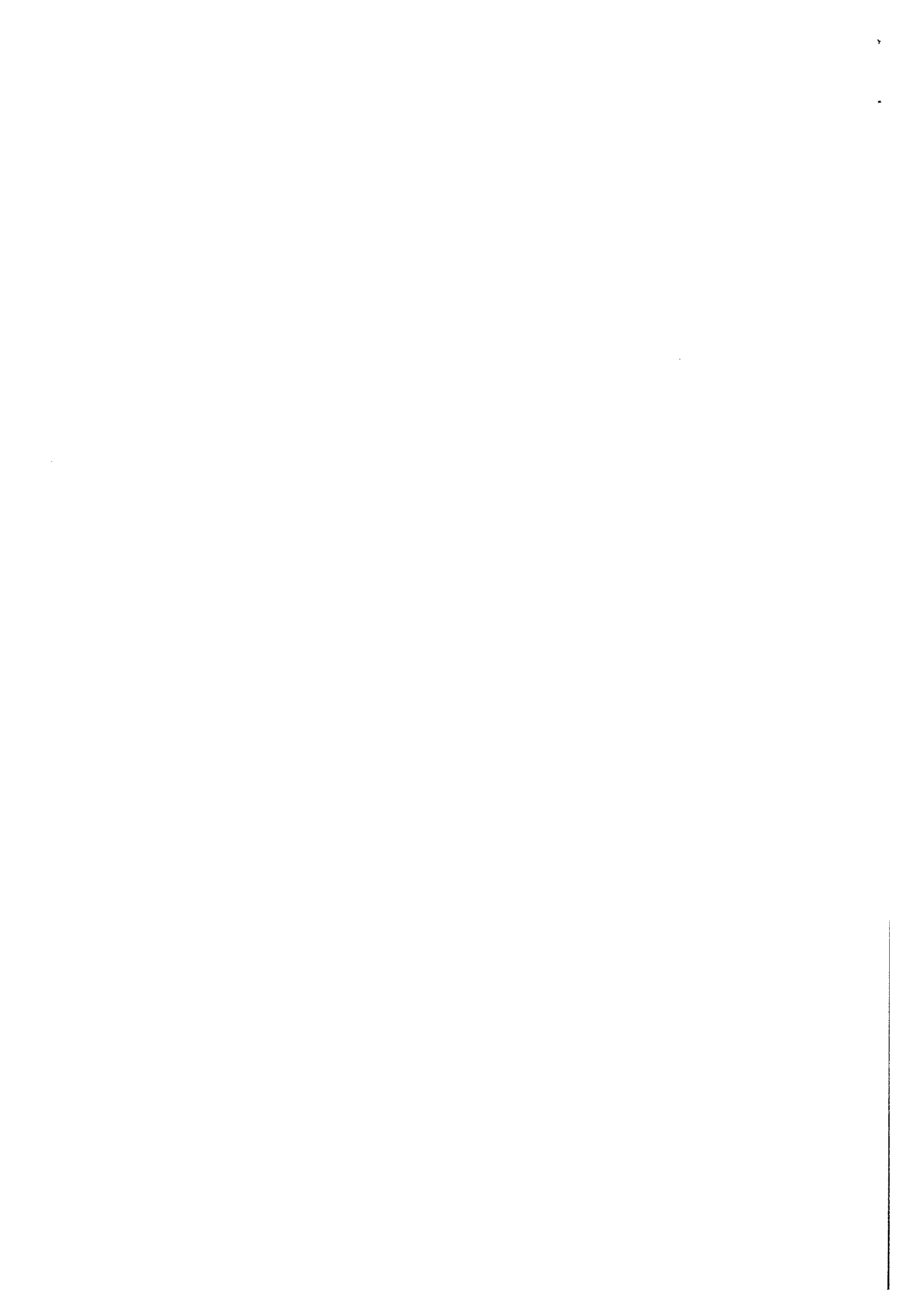


Fig. 2. Numbers of Pacific halibut per 30 min. trawled sampled by Ginryu maru No.5 during the Japan-U.S. cooperative groundfish survey in the Aleutian Region in May-July of 1986.





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PRELIMINARY REPORT ON JAPAN-U.S. COOPERATIVE GROUND FISH SURVEYS  
IN THE ALEUTIAN REGION BY GINRYU MARU NO. 5 IN 1986

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Fisheries Agency of Japan  
1986 September

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The survey on North Pacific groundfish resources by the Fisheries Agency of Japan in 1986 was conducted using the Ginryu maru No. 5, a landbased dragnet stern trawler in the Aleutian region during the period between May and September, as part of the Japan-U.S. joint survey activities. This report summarizes activities during the first survey conducted between May and July.

## 1. Outline of survey

The Japan-U.S. joint survey on groundfish resources has been conducted in the eastern Bering Sea, the Aleutian Islands region, and the Gulf of Alaska with the main objective to estimate biomass of groundfish resources since 1979. The 1986 Japan-U.S. cooperative survey was the third conducted in the Aleutian region, as a continuation of those in 1980 and 1983. Survey areas were surrounding the Aleutian Islands from 170°E to 165°W and were divided into six strata such as Southwest, Southeast, Northwest, Northeast, Bowers Ridge and southern Bering Sea (Fig. 1). Each stratum was further divided into two to three substrata and also divided into five depth zones such as depths between 1 and 100 m, 101 and 200 m, 201 and 300 m, 301 and 500 m, and 501 and 1,000 m. The number of trawl hauls in each depth zone was determined according to the magnitude of biomass of the major species obtained from the past surveys.

Thirty-minute tows were conducted at each station and the catches were weighed with a spring scale by species (or species group) to obtain the weight composition of the catch. When the catch was in excess of about 5 t, a part of the catch was sampled and the entire composition was estimated from the weight composition of the samples. For the major species, about 50 to 200 individuals were taken randomly, separated by sex, and their body lengths were measured. The number of individuals by species caught were obtained by estimation from the average weight of samples or counting directly. In addition, measurements of the relationship between the body length and body

weight for major species and collections of age characteristics were also made. Records of bottom water temperature were collected using XBTs at the rate of one out of two tows.

Although measurements of trawl opening while trawling were attempted by acoustic means, no clear results were obtained.

Five to twenty-minute trawl operations were conducted in the areas where many Pacific cod and Atka mackerel were caught in order to tag these species in addition to trawling for estimation of biomass. Fish caught were kept temporarily in a water tank set up on deck and those in good condition were selected for tagging and measured before being released.

## 2. Scientists on board

The following three scientists and about 20 crew members were always engaged in the research activities. They were:

Kei-ichi Mito	Far Seas Fisheries Research Laboratory
Hirokazu Yoshimura	Tokyo University of Fisheries
Lael Ronholt	Northwest and Alaska Fisheries Center, Seattle (from May 14 to June 13)
Ronald Payne	Northwest and Alaska Fisheries Center, Seattle (from June 13 to July 14)

## 3. Research vessel and gear

The Ginryu maru No. 5 (349.72 GT) is a landbased dragnet stern trawler of almost the same type as research vessels engaged in the previous Japan-U.S. joint surveys on groundfish resources in and after 1979.

Specifications of the Ginryu maru No. 5 are shown in Table 1.  
Specifications of gears used during the survey are shown in Table 2.

#### 4. Itinerary of survey

The Ginryu maru No. 5 departed from Kushiro on May 14, 1986. The survey was conducted from the west to the east in Southwest strata from May 19 to June 3 (Japan Standard Time). Thereafter, the surveys were conducted from west to east in the east side of the Northwest strata from June 4 to June 7 and also in the Northeast strata from June 6 to June 10. Thereafter the Ginryu maru No. 5 entered Dutch Harbour for refueling and replacement of the U.S. scientist on June 13 and departed from Dutch Harbour on the same day, returning again to the Northeast strata where the survey was resumed from west to east from June 15 to July 8. The survey was conducted in the southern Bering Sea strata from July 8 to 10 and the vessel entered Seward, Alaska on July 14, then the first survey was completed.

The Ginryu maru No. 5 departed on July 20 and was still conducting research activities with the Lets Go, the U.S. research vessel, in the Aleutian region in August.

#### 5. Outline of research results

In the first survey, a total of 173 trawling operations were conducted during 49 days in the survey area. Of these trawling operations, 16 were conducted for tagging and the others for estimation of biomass. A total of 149 trawl operations were made (excluding unsuccessful hauls): 51 in Southwest strata, 16 in Northwest strata, 73 in Northeast strata, and 9 in southern Bering Sea strata. In Southwest and Northeast strata, almost all scheduled trawl operations, except the operations in depths shallower than 100 m, were completed. Because some depth zones shallower than 100 m are within 3 miles of the U.S. coast and/or the sea bottoms are rough, the scheduled numbers of trawling operations were not fully completed.

Catches per 30-minute tow of the major species are shown in Table 3 by area and by depth zone. Trawling operations in the Northwest and southern Bering Sea strata were only a part of the scheduled number of operation. In the Southwest strata, the dominant species were: atka mackerel in depths between 1 and 100 m, atka mackerel, northern rockfish, and pollock in depths between 101 and 200 m, Pacific ocean perch and red squid (Barryteuthis magister) in depths between 201 and 300 m, rougheye rockfish in depths between 301 and 500 m, and giant grenadier in depths between 501 and 1,000 m. In the Northeast strata, the dominant species were: Pacific cod in depths between 1 and 100 m, pollock, Atka mackerel, and Pacific cod in depths between 101 and 200 m, pollock and Pacific ocean perch in depths between 201 and 300 m, arrowtooth flounder in depths between 301 and 500 m, and giant grenadier in depths between 501 and 1,000 m.

The results of the first half of the Japan-U.S. joint survey on North Pacific groundfish resources in the Aleutian region in 1980 and 1983 were reported by Yamaguchi (1980) and Teshima (1983) for the catches per 60-minute tows. The results were converted into the catches per 30-minute tows and compared with the results of this year's survey for Southwest and Northeast strata (Table 4). Survey periods in 1980 and 1983 were in July and August, one to two months later than this year (1986). Lengths of the headrope and footrope of trawl used were 30.8 and 44.0 m in 1980, respectively, 46.9 and 58.0 m in 1983, respectively, and the lengths this year were intermediate to lengths in 1980 and 1983. Catches per 30-minute tows for all the major species were highest in 1986, except for catch of shorttraker rockfish. In particular, for arrowtooth flounder, Pacific ocean perch, northern rockfish, and rougheye rockfish, remarkably large catches were made compared with other survey years.

The numbers of halibut caught per 30-minute tows at each trawling station are shown in Fig. 2. The trawling stations with high density were concentrated in waters between 174°E and 175°E. In addition,

length composition of halibut is shown in Table 5 by area and by depth. Modes were found at 41 to 45 cm in depths between 101 and 200 m and at 51 to 55 cm in depths between 201 and 300 m in the Southwest strata. There was a great number of individuals of 61 to 80 cm length in depths between 101 and 200 m of the Northeast strata and the size of halibut in the Northeast strata was larger than in the Southwest strata.

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REFERENCES, TABLES 1 TO 5, AND FIGS. 1 AND 2  
ARE IN ENGLISH IN THE JAPANESE DOCUMENT