AGENDA E-4
December, 1980

M E M O R A N D U M

TO: Council Members, SSC and AP

FROM: Jim H. Branson
Executive Director

DATE: November 25, 1980

SUBJECT: Tanner Crab FMP

ACTION REQUIRED

Final choice of alternatives proposed in Amendment #7.

I. TALFF for C. opilio

A. Status Quo - leave the TALFF as in 1980 at 7,500 mt North of 58° N. lat.

B. Set DAH = OY but not to exceed ABC which is calculated at 91 million pounds for 1981 (Reeves, 1980). TALFF would be zero.

II. OY for C. bairdi

A. Status Quo - leave the Optimum Yield for C. bairdi in all districts at the 1980 levels.

B. Change OY's for C. bairdi in the Bering Sea, Chignik and South Peninsula Management areas to reflect the latest estimates by NMFS and ADF&G:

	1980 OY (Millions of lbs)	Proposed 1981 OY (Millions of lbs)
Bering Sea	27.0 - 33.0	28.0 - 36.0
Chignik	---	5.0
South Peninsula	20.0 - 30.0	6.0

BACKGROUND

Public hearings have been held on this amendment as follows:

10/21/80	Dutch Harbor
11/03/80	Nome
12/06/80	Seattle
	Kodiak
12/09/80	Anchorage

Reference documents for this amendment are:

1. Reeves, J. "Assessment of Tanner Crab Stocks From the 1980 NMFS Trawl Survey in the Bering Sea" and Addendum. (Addendum in your book)

2. Richardson, J. "Market Aspects of the Foreign Allocation of C. opilio Tanner Crab in the Bering Sea Under the Framework of the Fishery Conservation and Management Act of 1976." (Draft copy was distributed at the September Council Meeting.)

3. "A Limited Comparison of the Tanner Crab Fishery Management Plan with the 1980 State of Alaska Shellfish Regulations" (Discussion Document for the joint Council - Board Meeting).

4. Otto, R. S. "Distribution and Relative Abundance of Tanner Crabs Derived from the 1980 NMFS Trawl Survey of the Eastern Bering Sea" (Abstract only in your book. Paper will be presented by R. S. Otto.)

5. Wolotira, Jr., R., and T. M. Armetta, "Summary of Observations of Japanese Tanner Crab Flats In The Eastern Bering Sea," NMFS, NWAFC, October, 1980, (Summary in your book, complete report available. Use as a supporting document for Reeves (1980)).

1981 Harvest Range for C. bairdi in the Eastern Bering Sea

There is evidence from fishery information (Lechner and Tate, 1976; Lechner, 1977) that significant molting of C. bairdi males in the eastern Bering Sea commences in mid-June. Since the 1980 NMFS survey was earlier than in 1979 (70% coverage by mid-June as opposed to 38% in 1979 - see Table 1), prerecruit crabs were expected to molt to legal size between the time of the survey and the 1981 fishery. Based on this information, Reeves (1980) projected a harvest range of 34-48 million pounds for 1981. Subsequent analysis of survey data, not available at the September 1980 meeting of the North Pacific Fishery Management Council, indicated that shell condition of prerecruit crabs in 1980 was not substantially different from that in 1979 (Table 2). Reconsideration of this information by the Tanner Crab Plan Development Team led them to conclude that the molting period for C. bairdi is probably variable from year to year. Consequently, it was decided that, since the 1980 survey estimate of legal C. bairdi was essentially the same as last year, the 1981 harvest range should be the same as last year, i.e., 28-36 million pounds.

Addendum to Reeves (1980)

REFERENCES

Lechner, J. 1977. King and tanner crab fishery in the eastern Bering Sea, 1977. INPFC Ann. Rpt. for 1977: 77-93.

Lechner, J. and P. Tate. 1976. United States King and Tanner Crab Fishery in the eastern Bering Sea, 1976. INPFC Ann. Rpt. for 1976: 92-104.

Reeves, J. E. 1980. Assessment of tanner crab stocks from the 1980 NMFS trawl survey on the eastern Bering Sea. MS report, 12 p.

Table 1. Percent coverage of the NMFS survey south of 58°N by week for 1979 and 1980.

Stations completed by:	Cumulative Percent Coverage 1979 Survey	1980 Survey
5/13	0	4
5/20	0	18
5/27	16	30
6/3	31	43
6/10	35	54
6/17	38	70
6/24	43	82
7/1	52	86
7/8	60	90
7/15	67	91
7/22	73	96
7/29	88	100
8/5	94	
8/12	94	
8/19	96	
8/26	100	

Table 2. Shell condition data for prerecruit (124-144 mm) male C. bairdi in the eastern Bering Sea for 1979 and 1980.

	Molting	New Shell	Old Shell	Total
1979	23 (2%)	936 (65%)	479 (33%)	1,438
1980	66 (5%)	795 (63%)	391 (31%)	1,252

A LIMITED COMPARISON OF THE TANNER CRAB FISHERY MANAGEMENT PLAN WITH THE 1980 STATE OF ALASKA SHELLFISH REGULATIONS

1. Purpose.

The purpose of this comparison is to highlight the major differences between the State 1980 shellfish regulations and the Tanner Crab Fishery Management Plan to help the Council and the Board of Fisheries reconcile differences which exist between the two.

The following areas will be considered in this comparison:

1. optimum yield and guideline harvest levels;
2. opening and closing dates in the management areas;
3. pot limits.

We are working with the Alaska Department of Fish and Game and National Marine Fisheries Service planning a complete re-draft of the Tanner Crab FMP. A process that will probably start in February 1981 to have the revised FMP in place for 1982.

2. Comparison of Optimum Yield and Guideline Harvest Levels.

The following table shows the current guideline harvest levels set by the State of Alaska and the optimum yields currently in the FMP for the various management areas.

As can be seen from Table 1, there are currently many differences between the optimum yields in the FMP and guideline harvest levels in the State of Alaska Shellfish Regulations. The Council should work with the Alaska Board of Fisheries to establish compatible 1981 guideline harvest levels and OY's.

TABLE 1. Optimum Yield [1/] Compared With Guideline Harvest Levels

(In Millions of Pounds)

Management Area	FMP 1980 OY	FMP Proposed 1981 OY	State Regulations 1980 GHL
Southeast	2.5	2.5	0.5 - 3.0
Yakutat	3.0	3.0	.75 - 2.5
Cook Inlet	5.3	5.3	11.0
Kodiak	35.0	35.0	10.0 - 25.0
Bering Sea	22.0 - 33.0 (C. bairdi)	34.0 - 44.0	28.0 - 36.0 (C. bairdi)
	103.0 - 153.0 (C. opilio)	OY ≤ ABC [2/]	None
South Peninsula	20.0 30.0	6.0	15.0 - 20.0
Chignik	[3/]	5.0	5.0 - 10.0
Aleutian	2.0	2.0	None

1/ for Chionoecetes bairdi, unless noted

2/ ABC = 91 million pounds (Reeves, 1980)

3/ Included in the South Peninsula Management Area OY

The Council needs to make decisions on the final OY's to be included in Amendment #7 which proposes adjustments for C. bairdi in the Bering Sea and establishment of optimum yields for the South Peninsula and Chignik management areas. The South Peninsula and Chignik management areas were defined in Amendment #6, but that amendment did not establish optimum yields for those areas.

3. Pot Limits.

The State of Alaska has established a 250 pot limit in Kodiak and a 100 pot limit in the Southeast management area. The current FMP has no pot limits in any management areas.

4. Opening and Closing Dates.

In the Southeast and Yakutat management areas the FMP opening date is September 1 and the closing date is May 15. State Regulations open those areas September 15 and close them May 1.

In the other management areas, the opening and closing dates were adjusted for the FCZ by a Department of Commerce/NMFS field order issued on October 23, 1980. That order changed the opening dates for the FCZ Tanner crab season to conform with the 1980 State of Alaska Shellfish Regulations and to reflect Amendment #6 to the FMP, which has not yet been approved by the Secretary of Commerce.

5. Amendment #7.

Dr. Jerry Reeves of the NWAFC has issued an addendum to the "Assessment of Tanner Crab Stocks from the 1980 NMFS Trawl Survey in the Bering Sea" report which lowers the originally recommended 1981 OY of 34-44 million pounds to 28-36 million pounds. Based on this addendum, the Council should consider changing the original proposal to adjust the OY for C. bairdi in the Bering Sea.

Distribution and Relative Abundance of Tanner Crabs Derived from the 1980 NMFS Trawl Survey of the Eastern Bering Sea.

R.S. Otto

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November 1980

ABSTRACT

Estimated abundance of Tanner crabs (C. bairdi and C. opilio) from NMFS trawl surveys are reviewed. Trends in abundance indicate the following for the area south of 58° N.:

1. The abundance of commercial-size C. bairdi declined from 1975 to 1979, but was stable at 31-32 million crab from 1979 to 1980.
2. Trends in abundance of pre-recruit C. bairdi paralleled those of commercial-size crab from 1975 to 1979, but show a significant increase from 1979 to 1980.
3. Geographic distribution of pre-recruits and analysis of size frequency data indicate that most pre-recruits are found in the Pribilof sub-district (west of 168° W. and south of 58°39'N), along the continental shelf edge.
4. Commercial-size C. bairdi are at low levels of abundance but it appears that stocks are recovering.
5. The abundance of commercial-size C. opilio apparently declined from 1975 to 1978, increased in 1979, and decreased substantially from 159 million crab in 1979 to 88 million in 1980.
6. Current analysis of geographic distribution and size frequency data does not provide useful information for forecasting population trends in C. opilio.

In the area north of 58°N. comparable estimates are available for 1975 and 1979-1980. Survey data indicate the following:

1. The overall abundance of commercial-size C. opilio in 1979 and 1980 was stable, but considerably lower than that of 1975.
2. The abundance of commercial-size C. opilio on the Japanese fishing grounds declined substantially from 1979 to 1980.

AGENDA E-4(d)
December, 1980

ACTION	ROUTE TO	INITIAL
	Exec. Dir.	
	Deputy Dir.	
	Admin. Off.	
	Exec. Sec.	
	Staff Asst. 1	
	Staff Asst. 2	
	Staff Asst. 3	
	Accountant	
	Secretary	
	Sec./Typist	

SUMMARY OF OBSERVATIONS OF JAPANESE TANNER CRAB FLEETS IN THE EASTERN BERING SEA, 1980

by

ROBERT J. WOLOTIRA, JR. and THERESE M. ARMETTA

Submitted to the

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

by the U.S. National Section

U.S. National Marine Fisheries Service
Northwest and Alaska Fisheries Center
2725 Montlake Boulevard East
Seattle, Washington 98112

October, 1980

Summary

1. The 1980 Tanner crab harvest by Japanese factoryship and land-based fleets in the eastern Bering Sea was about 7,096 MT or 11,750,000 crabs.
2. Overall species composition within the combined 1980 harvest was 5,860 MT opilio Tanner crab (83% of total); 836 MT bairdi Tanner crab (12%); and, 399 MT opilio x bairdi hybrids (6%).
3. The 1980 harvest was noticeably short of this year's quota of 7,500 MT. The shortfall of about 400 MT resulted because several land-based vessels did not achieve their targeted harvests.
4. Catch rates for numbers of crabs/effort was higher in 1980 than in 1979 for both fleets but weight/effort was lower, continuing a several year decline. The 1980 harvest was attained through catching and retaining smaller crabs.
5. Average carapace size and weight of Tanner crabs harvested by both fleets during 1980 were less than amounts determined for any previous year. In the factoryship fleet, over 27% of all crabs harvested were smaller than 101 mm (carapace width). This proportion of small crabs was about 2 1/2 times greater than in 1979, and 20 times greater than in 1978. For the land-based fleet, 9% of all crabs caught in 1980 were smaller than 101 mm, about 10 times greater than amounts determined in 1978 and 1979.
6. Factoryship harvests of opilio Tanner crab declined dramatically during the later weeks of the fishery. Substantially increased bairdi catches appeared to maintain late season catch rates or slow their decline.

SSC and AP
AGENDA E-4
December, 1980

ACTION	ROUTE TO	INITIAL
	Exec. Dir.	
	Deputy Dir.	
	[illegible] Dir.	
	[illegible] Sec.	
	[illegible] 1	
	[illegible] 2	
	[illegible] 3	
	[illegible]	
	[illegible]	
	Secretariat	

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October, 1980

Summary of Observations of Japanese Tanner Crab Fleets in the Eastern Bering Sea, 1980

by

Robert J. Wolotira, Jr. and Therese M. Armetta

The Fishery Conservation and Management Act of 1976 (P.L. 94-265) extended U.S. jurisdiction over fishery resources and established a program for resource management. During 1980, the U.S. Department of Commerce (DOC) established regulations for the harvest of Tanner crab (Chionoecetes sp.) by foreign fleets in the eastern Bering Sea. Japan was the only foreign nation allowed to participate. U.S. observers were placed aboard factoryship and land-based (independent) vessels to obtain biological information and monitor daily catches. This report summarizes the results of the observer program during 1980.

Harvest Guidelines for 1980

Most regulations regarding Japanese crab fishery operations in the eastern Bering Sea remained the same as in previous years. A summary of these regulations are:

a. No directed fishery for, or retention of, any species of king crab.

b. Crab fishing by pot gear only.

c. Processing of crab is permitted only on designated factoryships and vessels in the independent (land-based) fleet.

d. Only male snow (Tanner) crab can be retained and processed; females are to be discarded immediately after the pots are taken aboard and discarded in a manner that will minimize handling mortality.

e. Foreign crab fishing is not permitted within 12 miles of the baselines used to measure the U.S. Territorial Sea.

The U.S. DOC made two major changes in the 1980 regulations. The total allowable harvest was reduced from 15,000 MT (1978-1979 quota) to 7,500 MT. Additionally, all Japanese crab fishing operations were restricted to Bering Sea waters north of 58°00 N. latitude and west of 164°00 W. longitude. Earlier regulations permitted a portion of the quota (but no C. bairdi) to be harvested in a small region south of 58° N. latitude in waters west of 173° W. longitude.

Observer Program

Observers for these programs were selected by the University of Washington's Fisheries Research Institute and Oregon State University under contracts with the National Marine Fisheries Service (NMFS). All observers had a college degree in biological sciences, generally fisheries. However, knowledge or experience in the eastern Bering Sea crab fisheries was not a prerequisite for selection. During the months prior to departure, the observers were trained by reviewing the work of previous crab observers as well as studying a comprehensive manual of sampling instructions and procedures.

Factoryships

Only the crab factoryship Keiko Maru operated in the eastern Bering Sea during 1980 because of the reduced quota. An observer aboard the Keiko Maru was instructed to verify catches and sample the catch for biological studies. The biological sampling scheme was designed to obtain unbiased samples of crabs from all catches delivered to the factoryship. A bag of

crabs was selected at random from each of the four catcher boats and a random sample of 30 crab was identified to species, weighed and measured. A minimum sample of 120 crabs was obtained each day.

Land-based Vessels

Five observers were assigned to the land-based fleet to verify catches and take biological samples. Each observer was assigned to a separate vessel. Occasionally an observer-staffed land-based vessel would return to Japan. When this occurred, the observer transferred to another vessel for the remainder of the season. Observers were aboard and sampling during 550 of the 1497 fishing days in this year's land-based fleet season. Non-observer staffed vessels were boarded by an observer during the off-loading of their processed catches onto freighters. The total amount of processed product was determined and a calculation of total unprocessed catch was made using percent recovery estimates obtained by the observer during his daily sampling. These unprocessed catch estimates were then checked against a summary of daily catches which the off-loading vessel provided the observers throughout the season.

The Fishery

Factoryship Fleet

Only the factoryship Keiko Maru participated in the 1980 fishery, and its catcher boat fleet was reduced to only 4 vessels for the entire season. Fishing operations commenced in mid-February, the same as in 1979. Weekly catch and effort information are indicated in Table 1.

The reduced quota and number of catcher boats probably resulted in a greater concentration of fishing effort in 1980. Fleet operations ranged from 172°30' W. to 177°20' W. longitude and between 58° and 59° N.

latitude in a total of 9 INPFC area blocks, however, 90% of all effort was concentrated in 4 blocks between 173°-176° W. and 58°-59° N. (Figure 1). Effort during 1979 was distributed through 21 INPFC blocks, but early season operations were very similar to this year's total effort.

The factoryship fleet harvest in 1980 was about 2,894 MT, of which 2,290 MT (79%) was C. opilio; 475 MT (16%) was C. bairdi; and 129 MT (4%) was opilio x bairdi hybrids. This harvest contained a total of about 5.5 million crabs of which 77% was C. opilio, 20% C. bairdi, and 3% hybrids. The proportion of C. bairdi in the 1980 catch was about double that for any year since Japan's crab fishery was restricted to waters mostly north of 58° N. latitude.

During 1980, the factoryship fleet fished the Bering Sea grounds for 134 days and effort was over 356,000 pot lifts (Table 1). Catch rates fluctuated between 6-12 kg/pot lift or 12-20 crabs (Figure 2) but by mid-May, started a near-continuous decline for the remainder of the season. At that time there was a noticeable shift to harvesting smaller crabs and C. bairdi. Until mid-May, C. bairdi crabs had comprised between 5-10% of weekly harvests, but through June and early July this species comprised 40-60% of the catches.

It is difficult to compare factoryship fleet catch rate information for 1980 with earlier data because of substantial changes in quotas and effort. The 1979 harvest of nearly 11,728 MT was taken by two factoryships and 13 catcher boats in about 1.29 million pot lifts for an average catch per pot lift of 9.11 kg and 14.5 crabs (Wolotira et al, 1979). Catch rate by weight in 1980 dropped to about 8.1 kg while catch rate by number increased to 15.4 crabs. Differences between the 1979 and 1980 fleet fisheries are more comparable if data only from the Keiko Maru are examined. In 1979 the Keiko Maru harvested nearly 5,990 MT with an average catch rate of 9.9 kg per

pot lift. Furthermore, its initial 3,000 MT harvest in 1979 was accomplished in about 248 thousand pot lifts--a catch greater than the entire 1980 factoryship harvest from 110 thousand fewer pot lifts.

Carapace width and individual weight data collected by U.S. observers indicates that Tanner crabs harvested by the factoryship fleet in 1980 were substantially smaller than crab harvested in earlier years (Figure 3). During 1980, nearly 27% of the crab harvested were less than 101 mm in carapace width (C.W.). In comparison, crabs smaller than 101 mm comprised less than 10% of the 1979 factoryship harvest and only 1% of the harvest in 1978.

Size comparison data by species for the 1980 fishery indicates that most small crab harvested were C. opilio Tanner crab. Of the estimated 1.5 million crabs less than 101 mm (C.W.) caught in 1980 by the factoryship fleet only about 260 thousand were C. bairdi Tanner crabs (23% of C. bairdi catch).

Land-based Fleet

The Japanese Fishery Agency assigned a quota of 4,600 MT to the land-based fleet in 1980 as compared to 3,270 MT in 1978 and 1979. A total of 14 independent vessels participated in this year's operations as compared to 11 in 1979.

The land-based fleet commenced 1980 operations in mid-March (Table 2), fully two months earlier than in any recent year. Fishing effort focused on areas west of the factoryship fleet during the early part of the season (Figure 1) and then dispersed northwestward by June.

The land-based fleet harvest of Tanner crab for 1980 was slightly more than 4,200 MT. Of this amount, 3,570 MT (85% of total) was C. opilio; 361 MT (9%) was C. bairdi; and 270 MT (6%) was hybrid Tanner crabs. This total catch contained over 6.25 million crabs of which 84% were

C. opilio, 11% C. bairdi, and 6% hybrids. Species composition by weight and number for this harvest was generally the same as in previous years.

The total land-based fleet harvest for 1980 was about 400 MT below their targeted amount and resulted in a total fishery shortfall of 400 MT below the 1980 quota. This shortfall was about 6 times larger than that experienced in 1979.

Total fishing days during 1980 (not including bad weather and transit days) were 1497 days and resulted in an average catch per vessel day of about 2.8 MT or 4,184 crabs. The average number of crab caught per day was almost identical to that of 1979 (4,172, ibid), but catch rate by weight was not similar. Average catch by weight per pot in the 1980 land-based fleet continued a 4 year decline from the 1977 level of 4.4 MT (Beardsley and Bowerman, 1977).

The land-based fleet fishery experienced weekly catch rate fluctuations similar to those of the factoryship fleet, especially with respect to low catches in late May and June (Figure 2). Bairdi Tanner crab comprised 8-9% of weekly harvests through May and increased to 17-18% during June and July. This change in species composition was similar to harvests in the factoryship fleet although not as dramatic. Almost no C. bairdi crab were harvested by the land-based fleet after July.

Catch rates for 1980 were determined from those land-based vessels with U.S. observers aboard (roughly 1/3 of the total fleet effort). Weekly catch per pot lift information for this portion of the fleet showed trends similar to those in the factoryship data. In 1980 the number of crabs caught per pot lift was higher than in 1979 (4.7 vs. 4.5 crabs), while weight per pot lift was lower (3.7 kg vs. 3.1 kg.).

Carapace widths and individual crab weights collected by U.S. observers indicated that Tanner crabs harvested by the 1980 land-based fleet were smaller than crabs caught during the last two years (Figure 3). Average

carapace size for 1980 was about 115.4 mm and crabs weighed an average of .67 kg. During 1978-1979, average sizes were about 119 mm and .73-.75 kg.

Summary

1. The 1980 Tanner crab harvest by Japanese factoryship and land-based fleets in the eastern Bering Sea was about 7,096 MT or 11,750,000 crabs.
2. Overall species composition within the combined 1980 harvest was 5,860 MT opilio Tanner crab (83% of total); 836 MT bairdi Tanner crab (12%); and, 399 MT opilio x bairdi hybrids (6%).
3. The 1980 harvest was noticeably short of this year's quota of 7,500 MT. The shortfall of about 400 MT resulted because several land-based vessels did not achieve their targeted harvests.
4. Catch rates for numbers of crabs/effort was higher in 1980 than in 1979 for both fleets but weight/effort was lower, continuing a several year decline. The 1980 harvest was attained through catching and retaining smaller crabs.
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6. Factoryship harvests of opilio Tanner crab declined dramatically during the later weeks of the fishery. Substantially increased bairdi catches appeared to maintain late season catch rates or slow their decline.

Literature Cited

Beardsley, A.J. and J.H. Bowerman. 1977. Observations of Japanese Tanner Crab Vessels during 1977. INPFC Doc. 2022

Wolotira, R.J., T.M. Armetta, and G.L. Alterman. 1979. Summary of Observations of Japanese Tanner Crab Fleets in the Eastern Bering Sea, 1979. INPFC Doc. 2248.

Table 1. Weekly Tanner crab catch information for the Japanese factoryship Keiko Maru during 19

WEEK NO.	WEEK	DAYS FISHED	TOTAL CATCH WEIGHT (MT)	AVG. DAILY CATCH (MT)	CPUE (KG/POT)	POTS HAULED	NO. OF CRAB	CPUE (CRAB/P
1	2/24-3/01	5	52.756	10.55	7.49	7,040	88,065	12.5
2	3/02-3/08	7	173.952	24.85	11.42	15,232	318,042	20.8
3	3/09-3/15	7	162.958	23.28	9.72	16,768	286,865	17.1
4	3/16-3/22	7	160.080	22.87	10.34	15,488	295,733	19.0
5	3/23-3/29	7	154.746	22.11	7.95	19,456	294,209	15.1
6	3/30-4/05	6	109.724	18.29	6.49	16,896	194,496	11.5
7	4/06-4/12	7	129.820	18.55	7.43	17,472	233,373	13.3
8	4/13-1/19	7	143.022	20.43	7.44	19,232	266,658	13.8
9	4/20-4/26	7	154.652	22.09	10.28	15,040	283,634	18.8
10	4/27-5/03	7	157.416	22.49	8.88	17,728	276,989	.6
11	5/04-5/10	7	212.828	30.40	10.65	19,984	387,165	19.3
12	5/11-5/17	7	214.598	30.66	11.27	19,044	372,060	19.5
13	5/18-5/24	7	217.618	31.09	10.76	20,218	384,652	19.0
14	5/25-5/31	7	156.191	22.31	8.08	19,328	297,857	15.4
15	6/01-6/07	7	155.307	22.19	7.92	19,616	303,323	15.4
16	6/08-6/14	7	135.992	19.43	6.98	19,472	271,670	13.9
17	6/15-6/21	7	106.304	15.19	5.20	20,448	233,448	11.4
18	6/22-6/28	7	126.684	18.10	6.26	20,238	308,437	15.2
19	6/29-7/05	7	121.718	17.39	5.53	22,000	291,172	13.2
20	7/06-7/12	4	47.964	11.99	3.13	15,330	109,899	7.1
	SEASON	134	2,894.330	21.28	8.13	356,030/5,497,747		15.4

Table 2. [illegible] Bering Sea.

WEEK NO	DATES	NUMBER OF VESSELS	EFFECTIVE FISHING DAYS [1]	POTS FISHED [2]	WEEKLY CATCH (MT)	WEEKLY CATCH (NO)	CATCH RATES [2] KG/POT LIFT	CATCH RATES [2] NO./POT LIFT
3	3/09-3/15	1	6 (06) [3]	3,686	21.645	29,594	5.86	8.03
4	3/16-3/22	1-3	16 (16)	10,040	49.440	66,989	4.92	6.67
5	3/23-3/29	3	21 (16)	17,538	84.950	120,297	4.84	6.86
6	3/30-4/05	1-6	32 (21)	13,748	84.346	114,531	4.63	6.34
7	4/06-4/12	1-6	33 (16)	14,486	125.021	168,520	5.71	7.66
8	4/13-4/19	5-6	40 (19)	15,368	105.051	141,373	3.64	4.95
9	4/20-4/26	6-8	47 (17)	14,577	110.721	155,221	2.72	4.15
10	4/27-5/03	6-8	50 (22)	13,860	102.814	143,955	2.42	3.53
11	5/04-5/10	6-13	68 (26)	20,430	209.477	305,100	4.18	6.43
12	5/11-5/17	10-12	80 (22)	18,565	283.861	411,015	4.40	6.48
13	5/18-5/24	10-15	86 (28)	25,298	314.601	445,253	6.06	8.52
14	5/25-5/31	13-14	96 (34)	29,705	359.340	517,524	4.23	6.17
15	6/01-6/07	13-14	95 (35)	31,787	263.586	387,995	2.95	4.46
16	6/08-6/14	13-14	96 (35)	33,758	232.311	341,898	2.34	3.33
17	6/15-6/21	13-14	90 (33)	29,726	148.890	220,689	1.87	2.84
18	6/22-6/28	13	91 (34)	34,505	178.112	270,835	1.60	2.53
19	6/29-7/05	11-13	84 (27)	30,350	163.238	246,155	1.72	2.67
20	7/06-7/12	11-12	79 (27)	31,637	150.471	233,898	1.97	3.15
21	7/13-7/19	9-10	66 (25)	27,939	113.616	176,418	1.89	3.01
22	7/20-7/26	8-9	63 (28)	29,655	114.282	186,402	2.28	3.73
23	7/27-8/02	5-7	45 (22)	24,217	134.893	229,970	2.67	5.00
24	8/03-8/09	7	49 (12)	13,350	165.804	258,608	2.94	5.15
25	8/10-8/16	6-7	49 (4)	4,480	181.519	282,913	1.74	3.27
26	8/17-8/23	5-7	46 (0)	*	225.147	348,137	*	*
27	8/24-8/30	2-6	28 (3)	3,090	124.373	194,854	4.85	9.16
28	8/31-9/06	2	14 (5)	4,700	76.893	127,752	6.59	12.01
29	9/07-9/13	2	12 (6)	6,720	40.181	64,204	2.99	5.08
30	9/14-9/20	1-2	10 (6)	6,060	23.919	37,082	1.78	2.81
31	9/21-9/27	1	5 (5)	4,500	11.596	17,140	2.58	3.81
		TOTALS	1,497 (550)	51,775	4,200.101 [4]	6,251,527 [4]		

1/ Bad weather, transit, and gear setting days omitted.
2/ Data only from vessels with U.S. Observers.
3/ Numbers in parentheses represent days for vessels with U.S. Observers.
4/ Includes minor amounts of total season catches not included in the weekly data, but identified by U.S. Observers during offloading inspections.

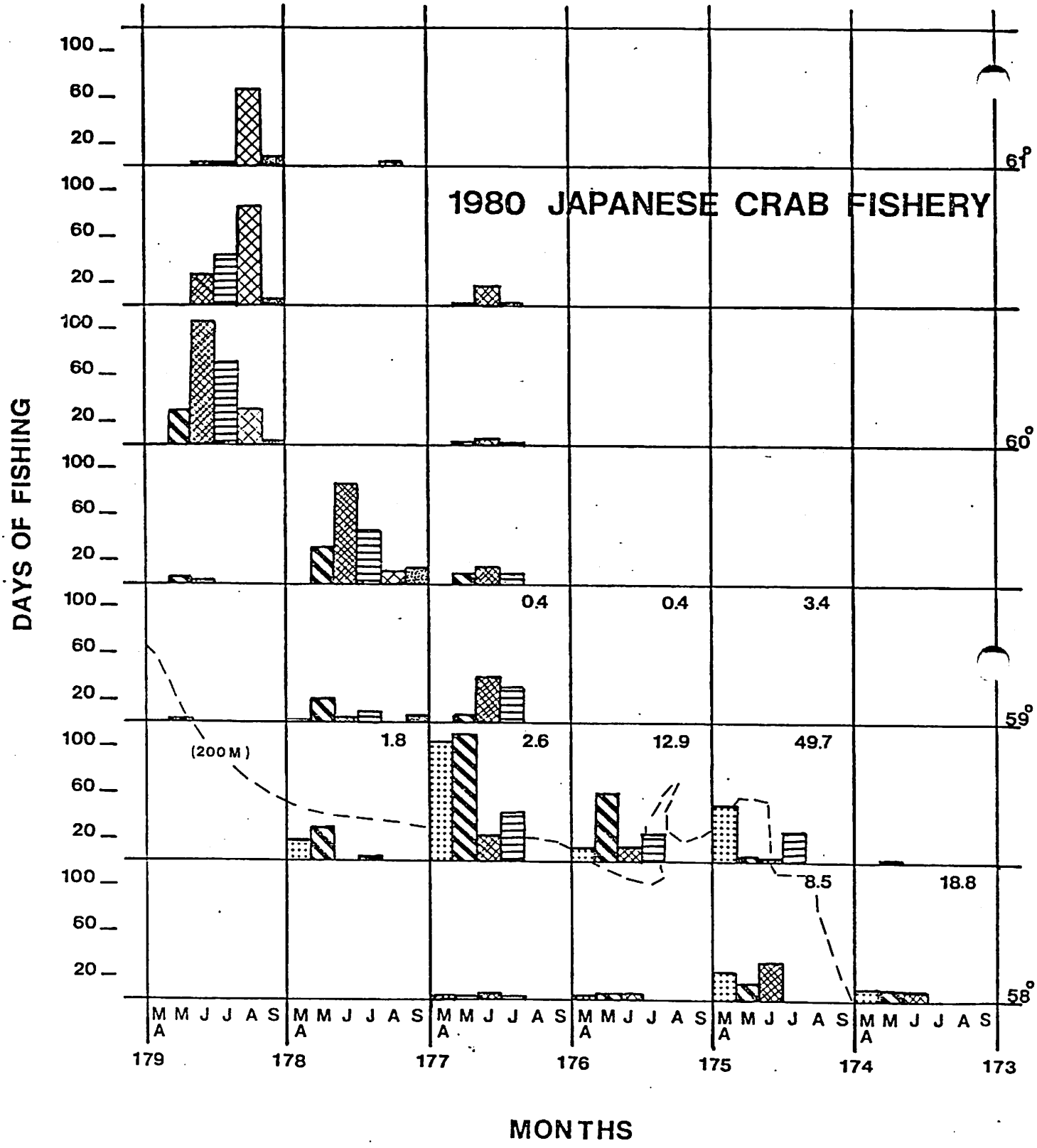

Figure 1. -- Number of fishing days by month and INPFC block for the Japanese land-based crab fleet in the eastern Bering Sea, 1980. Number in upper right corner of the blocks represent percent of total catcher boat days for the 1980 factoryship fleet.

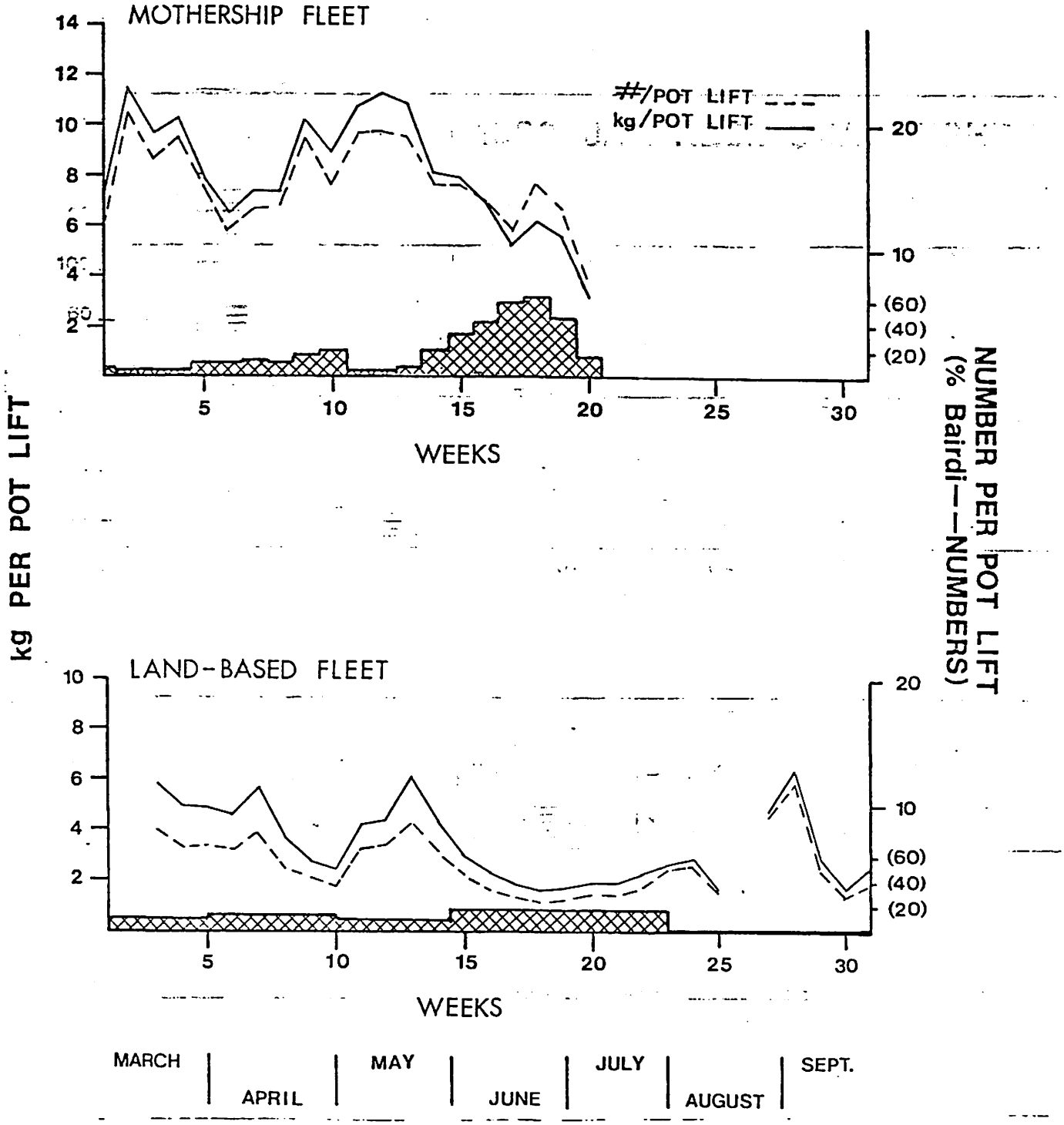

Figure 2. -- Catch per pot lift and percent bairdi in catches by week and by fleet for the 1980 Tanner crab fishery by Japan in the eastern Bering Sea.

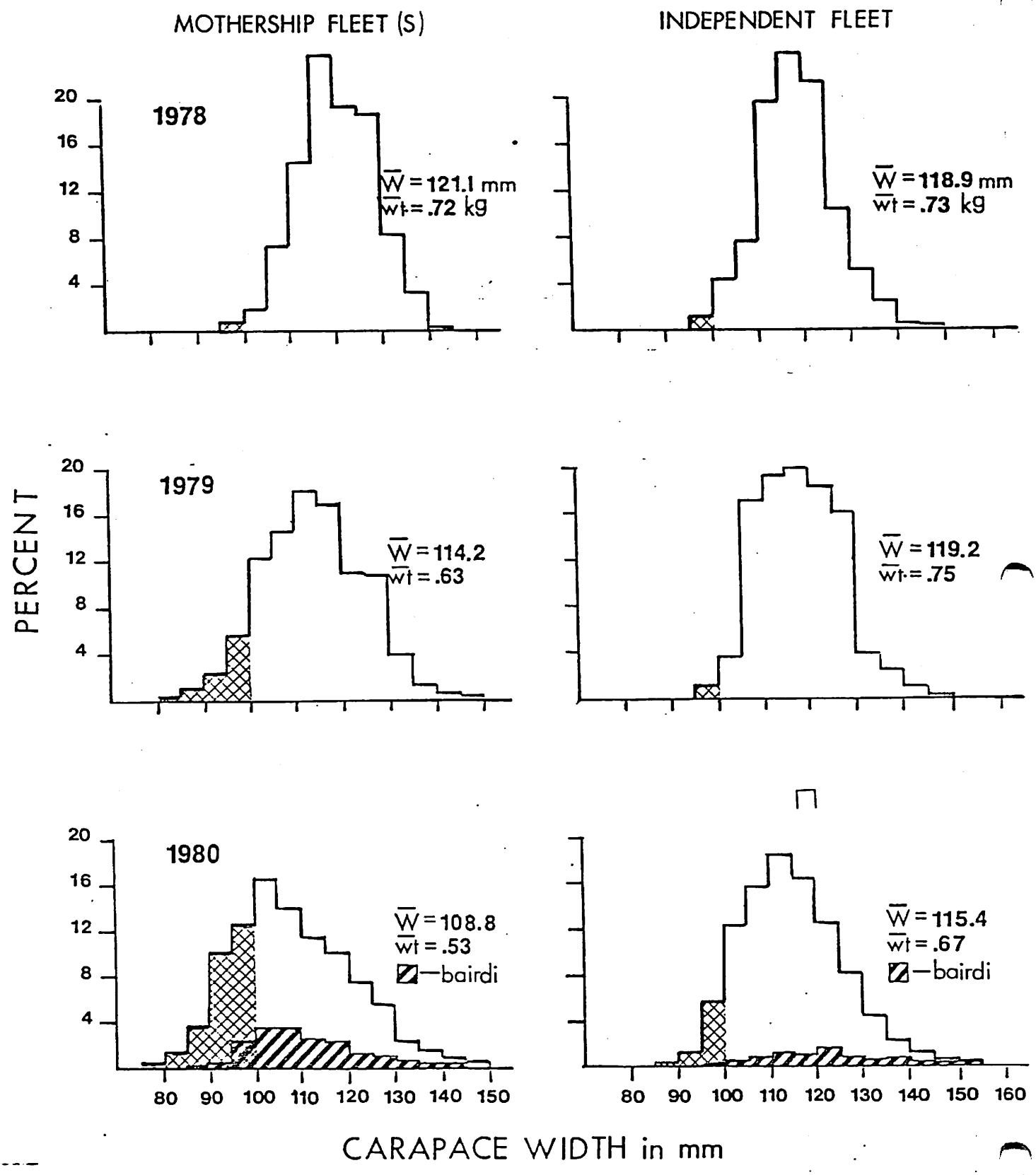

Figure 3. -- Size composition by fleet and year for Tanner crab harvested by Japan in the eastern Bering Sea for 1978-1980.

Distribution and Relative Abundance of Tanner Crabs Derived from the 1980 NMFS Trawl Survey of the Eastern Bering Sea.

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December 1980

ABSTRACT

Estimated abundance of Tanner crabs (C. bairdi and C. opilio) from NMFS trawl surveys are reviewed. Trends in abundance indicate the following for the area south of 58 degrees N.:

1. The abundance of commercial-size C. bairdi declined from 1975 to 1979, but was stable at 31-32 million crab from 1979 to 1980.
2. Trends in abundance of pre-recruit C. bairdi paralleled those of commercial-size crab from 1975 to 1979, but show a significant increase from 1979 to 1980.
3. Geographic distribution of pre-recruits and analysis of size frequency data indicate that most pre-recruits are found in the Pribilof sub-district (west of 168 degrees W. and south of 58 degrees 39 minutes N) and generally along the continental shelf edge.
4. Commercial-size C. bairdi are at low levels of abundance but it appears that stocks are recovering.
5. The abundance of commerical-size C. opilio apparently declined from 1975 to 1978, increased in 1979, and decreased substantially from 159 million crab in 1979 to 88 million in 1980.
6. Current analysis of geographic distribution and size frequency data does not provide useful information for forecasting population trends in C opilio.

In the area north of 58 degrees N., comparable estmates are available for 1975 and 1979-1980. Survey data indicate the following:

1. The overall abundance of commercial-size C. opilio in 1979 and 1980 was stable, but considerably lower than that of 1975.
2. The abundance of commercial-size C. opilio on the Japanese fishing grounds declined substantially from 1979 to 1980.

INTRODUCTION

The 1980 survey area was smaller than that of 1979 (Figure 1) but still covered almost all commercially important concentrations of Tanner crabs (Chionoecetes spp.). The northern portion of the 1979 survey area is characterized by extremely high concentrations of small (non-commercial) C. opilio and the absence of C. bairdi. The five stations along the western edge of the survey area, that were omitted from the 1980 survey, probably contain some commercially important concentrations of C. opilio. What follows is largely a synopsis of 1980 International North Pacific Fisheries documents. A more detailed account of the 1980 survey is contained in Otto et al (1980).

ABUNDANCE SOUTH OF 58 DEGREES

Survey estimates of Tanner crab abundance for the area south of 58 degrees N. (Table 1) are available from 1973 onward. These estimates are useful for showing trends in abundance but may not be strictly comparable from year to year due to differences in the areas surveyed. Abundance estimates for C. bairdi are comparable from 1974 onward while those for C. opilio are strictly comparable only for 1978 and 1979. Because the size of crabs entering U.S. and Japanese fisheries has been variable, the size groups given in Table 1 do not reflect current management practice. The abundance of male C. bairdi larger than 129 mm carapace width is used as an index to the abundance of commercially fishable C. bairdi and 109 mm is similarly used for C. opilio.

C. bairdi

The abundance of commercial-size crab (i.e. crabs >130 mm) apparently peaked in 1975, and declined in each subsequent year through 1979. Catch per unit effort also declined in this period (Eaton, 1980). Abundance was stable from 1979 to 1980.

The abundance of pre-recruit (85-129 mm) males generally paralleled that of commercial-size crab from 1975 through 1979. The abundance of this group increased significantly from 1979 to 1980 and may indicate that the fishable stock will increase in the near future.

A size limit of 140 mm (5.5") was imposed on U.S. fishermen in 1977. Abundance estimates of legal (140 mm) C. bairdi were 92.1 million in 1977, 45.6 million in 1978, and 31.5 million in 1979. The 1980 survey estimate of 31.0 million legal crab is considered identical to that of 1979.

Examination of size-frequency data for male C. bairdi indicates that increasing recruitment is expected in all sub-districts of the Bering Sea (Figure 2). Large numbers of pre-recruit crab are particularly prevalent in the Pribilof Islands where legal sized crab individuals scarce in 1978 and 1979. The distribution of medium and large-size C. bairdi males shows that pre-recruit crab are predominate on the continental slope (Figure 3) while large (or legal) crab are generally found in shallower areas of the continental shelf. Almost nothing is known about migrations of C. bairdi in the Bering Sea, and therefore it is not certain that crab in slope areas will be found farther to the east shallow as they grow and mature.

Limited tagging data suggest it is possible for crab in continental slope areas to be recruited to areas some 40 to 100 miles east where the majority of U.S. fishing occurs. If growth rates are slower on continental slope areas, and crab do not migrate, they may not be recruited to U.S. fisheries.

C. opilio

Abundance of large (@109 mm) C. opilio males was highest in 1975 and declined in each subsequent year through 1978 (Table 1).

Increasing abundance from 1978 to 1979 may reflect differences in the areas surveyed and/or migration of crab from areas north of 58 degrees. The abundance of large male C. opilio declined sharply from 1979 to 1980 when survey areas were almost identical. Catch per unit effort in the U.S. fishery declined from 116 to 94 crab per pot during the same period (Eaton, 1980). Size at entry in the U.S. fishery has increased from abut 105 mm criterion, the estimated abundance of commercial-size C. opilio was 150 million in 1979 and 78 million in 1980. Some of the decline in abundance south of 58 degrees may be explained by northward movement of large males, however, there is little doubt that the availability of commercial-size C. opilio declined significantly from 1979 to 1980.

Examination of size-frequency data for male C. opilio does not suggest a pattern of decreasing recruitment (Figure 4 A). Recruitment patterns are difficult to define because natural mortality rates are not known. Overall, the abundance of C. opilio males (without regard to size) has been declining since 1976 (Table 1) and this alone may indicate a trend toward declining recruitment. It is worth noting that there have been substantial changes in the distribution of commercial size C. opilio (Figure 5) from 1979 to 1980 , and it is not known whether these changes are due to migration or differences in mortality rates between various areas.

Hybrids

Changes in the apparent abundance of hybrids probably reflect difficulties in field identification. There has, however, been a decline in estimated abundance over the past four years. Since fisheries are not regulated with respect to hybrid crab, trends in their abundance are not very useful for management purposes.

ABUNDANCE NORTH OF 58 DEGREES

There was a vast difference in survey area coverage north of 58 degrees between 1979 and 1980. This difference, however, largely effects estimated abundance of small male and female C. opilio rather than harvestable males. It is also worth noting that the precision of estimated abundance north of 58 degrees is considerably less than that to the south (compare the last columns in Tables 1 and 2).

C. bairdi

There are virtually no large (@129 mm) C. bairdi north of 58 degrees. Reproductive data indicate that male C. bairdi mature at a smaller size in this area than in areas to the south and east. Japanese scientists estimated size at maturity in this area to be about 70 mm carapace width as opposed to 100 mm in areas to the south and east. Analysis of U.S. data indicates that the size at maturity is about 118 mm for areas east of the Pribilofs Islands and 110 mm in the Pribilofs and areas to the north (Somerton, 1980). Japanese and U.S. estimates of size at maturity are not in aggreement but, a cline in size at maturity is suggested, and it may be worth considering a different size limit north of 58 degrees. Japanese fisheries are unregulated with respect to size limits and observer data indicate that the size at entry in the Japanese catch was about 100 mm (4.0 inches) in 1980 (Wolotira and Armetta, 1980).

United States trawl survey data showed a substantial increase in the abundance of male C. bairdi in the 85-129 mm size group. Japanese trawl survey data showed an increase from 4.7 million to 11.1 million crab for the >99 mm size group between 1979 and 1980.

Additionally, the incidence of C. bairdi in the Japanese factoryship catch increased from 10% in 1979 to 20% in 1980 (Wolotira and Armetta, 1980). There can be little doubt that the abundance of C. bairdi in the area north of 58 degrees has increased.

Reference to figure 2A indicates that C. bairdi in the >99 mm size group will continue to increase, but growth rates in this area are unknown. Past surveys (Pereyra et al, 1976) indicate that few C. bairdi ever reach legal (U.S.) size in the area north of 58 degrees. Similarly, the maximum size in the 1980 Japanese fishery was 140-145 mm as compared to the U.S. minimum legal size of 140 mm.

C. opilio

U.S. trawl survey data showed a decline in the abundance of crab in the >109 mm size group, but this decline was not considered significant. The abundance of crab in the >104 m size group was 9.0 million in 1979 and 10 million in 1980 (Reeves). The abundance of C. opilio north of 58 degrees appears stable but considerably lower than in 1975. Japanese estimates of the abundance of C. opilio (>99 mm) on the Japanese fishing grounds declined from 37.7 million in 1979 to 24.3 million in 1980 (37%). The Japanese fishery however, covers only a small part of the area N. of 58 degrees. Catch rates and average size in the Japanese fishery also declined (See Reeves 1980) and the Japanese fishery fell 400 MT tons short of their 1980 quota. Both U.S. and Japanese surveys indicated that more large male C. opilio were found in areas to the east of the Japanese grounds during 1980 than in 1979. There is no doubt that the abundance of exploitable C. opilio on the Japanese fishing grounds has declined.

Reference to size frequency (Figure 4) and distribution data (Figure 5) show that few large C. opilio males are found north of 58 degrees.

It appears at this time, that C. opilio north of 58 degrees will not be of great interest to U.S. fishermen. With declining availability of C. opilio south of 58 degrees, U.S. fishermen may wish to enter the northern district fishery in the future.

Hybrids

Abundance estimates in the northern area are subject to the limitations outlined above for the area south of 58 degrees. Hybrid crab made up 6% of the Japanese catch (399 MT). For management purposes, the abundance of hybrids north of 58 degrees can probably be considered as negligable. (Table 2).

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Table 1 - Annual abundance estimates (millions of crabs) for Tanner crabs from NOAA surveys in the eastern Bering Sea, south of 58°.

Sex	Size Group*	1973	1974	1975	1976	1977	1978	1979	1980	95% Confidence Limits for 1980 Lower	Upper	±%
C. bairdi												
Males	<85	62.8	200.7	116.3	136.8	192.7	103.1	108.4	310.3	255.8	364.8	18
	85-129	140.5	255.0	207.5	131.7	159.6	90.1	69.4	198.3	174.4	222.3	12
	>129	66.9	130.5	209.6	157.8	111.1	57.9	39.7	40.7	30.0	47.4	16
Total Males		270.2	586.2	533.4	426.3	463.4	251.0	217.5	549.3	489.4	609.2	11
Females	<85	47.9	210.5	120.8	174.7	328.4	116.1	124.8	326.9	222.7	431.1	32
	>84	90.3	175.7	102.2	220.4	215.8	73.3	43.3	106.8	83.0	130.7	22
Total Females		138.2	386.2	223.0	395.1	544.2	189.4	168.1	433.7	326.8	540.6	25
Total Population		408.4	972.4	756.4	821.4	1,007.6	440.4	385.6	983.0	860.6	1,105.5	12
C. opilio												
Males	<110	115.2	1,480.3	1,916.7	2,221.1	1,850.9	830.2	779.4	570.5	486.6	654.3	15
	>109	84.7	246.7	274.8	181.6	137.3	78.4	106.3	53.6	46.9	60.2	12
Total Males		199.9	1,727.0	2,191.5	2,402.7	1,988.2	908.6	885.7	624.0	539.9	708.1	13
Females	<65	26.4	1,415.3	3,213.1	4,867.1	5,855.0	1,233.1	2,266.2	2,867.2	1829.6	3,904.7	36
	>64	26.8	195.9	194.3	697.3	535.5	111.4	157.8	92.5	49.5	135.5	46
Total Females		53.2	1,611.4	3,407.4	5,564.4	6,390.5	1,344.5	2,324.0	2,959.6	1921.2	3,998.1	35
Total Population		253.1	3,338.4	5,598.9	7,967.1	8,378.7	2,253.1	3,209.7	3,583.7	2541.9	4,625.5	29
C. bairdi x C. opilio**												
Males	<110	--	--	47.5	27.8	141.2	11.8	9.8	1.9	1.4	2.4	29
	>109	--	--	33.8	16.5	15.4	5.6	4.9	1.7	0.8	2.6	53
Total Males		--	--	81.3	44.3	156.6	17.5	14.7	3.7	2.6	4.7	30
Females	<65	--	--	190.8	1.1	141.2	7.5	25.9	.2	0.0	0.3	102
	>64	--	--	28.9	13.9	53.7	8.7	20.4	4.8	1.0	8.7	80
Total Females		--	--	219.7	15.0	194.9	16.2	46.3	5.0	1.1	8.9	78
Total Population		--	--	301.0	59.3	351.5	33.8	61.0	8.7	4.7	12.7	46

* mm, carapace width

** includes crab N. of 58° in 1978 (no separate estimate available).

Table 2 - Annual abundance estimates (millions of crabs) for Tanner crabs from NOAA surveys in the eastern Bering Sea, north of 58°.

Sex	Size Group*	1979	1980	95% Confidence Limits for 1980 Lower	Upper	±%
C. bairdi						
Males	<85	26.8	44.0	21.3	66.8	52
	85-129	3.7	10.3	6.1	14.6	41
	>129	0.15	0.1	-0.1	0.2	200
Total Males		30.6	54.4	31.3	77.6	42
Females	<85	48.2	100.3	21.8	178.7	78
	>84	3.4	9.3	1.8	17.0	81
Total Females		51.6	109.6	27.8	185.4	74
Total Population		82.2	164.1	81.9	246.2	50
C. opilio						
Males	<110	10,213.0	1,989.4	1,678.6	2,300.1	16
	>109	6.5	4.2	2.3	6.1	45
Total Males		10,219.5	1,993.6	1,682.8	2,304.4	16
Females	<65	12,563.0	2,966.5	1,640.1	4,292.9	45
	>64	49.9	46.0	22.1	69.8	52
Total Females		12,612.9	3,012.5	2,685.8	4,339.0	44
Total Population		22,832.4	5,006.0	3,643.5	6,368.5	27.2
C. bairdi x C. opilio						
Males	<110	1.1	1.3	0.6	2.1	54
	>109	0.4	0.7	0.2	1.2	77
Total Males		1.5	2.0	1.1	2.9	40
Females	<65	2.0	4.6	1.1	8.2	77
	>64	1.6	10.9	1.1	20.7	90
Total Females		3.6	15.6	5.1	26.0	67
Total Population		5.1	17.6	7.1	28.0	59

* mm, carapace width

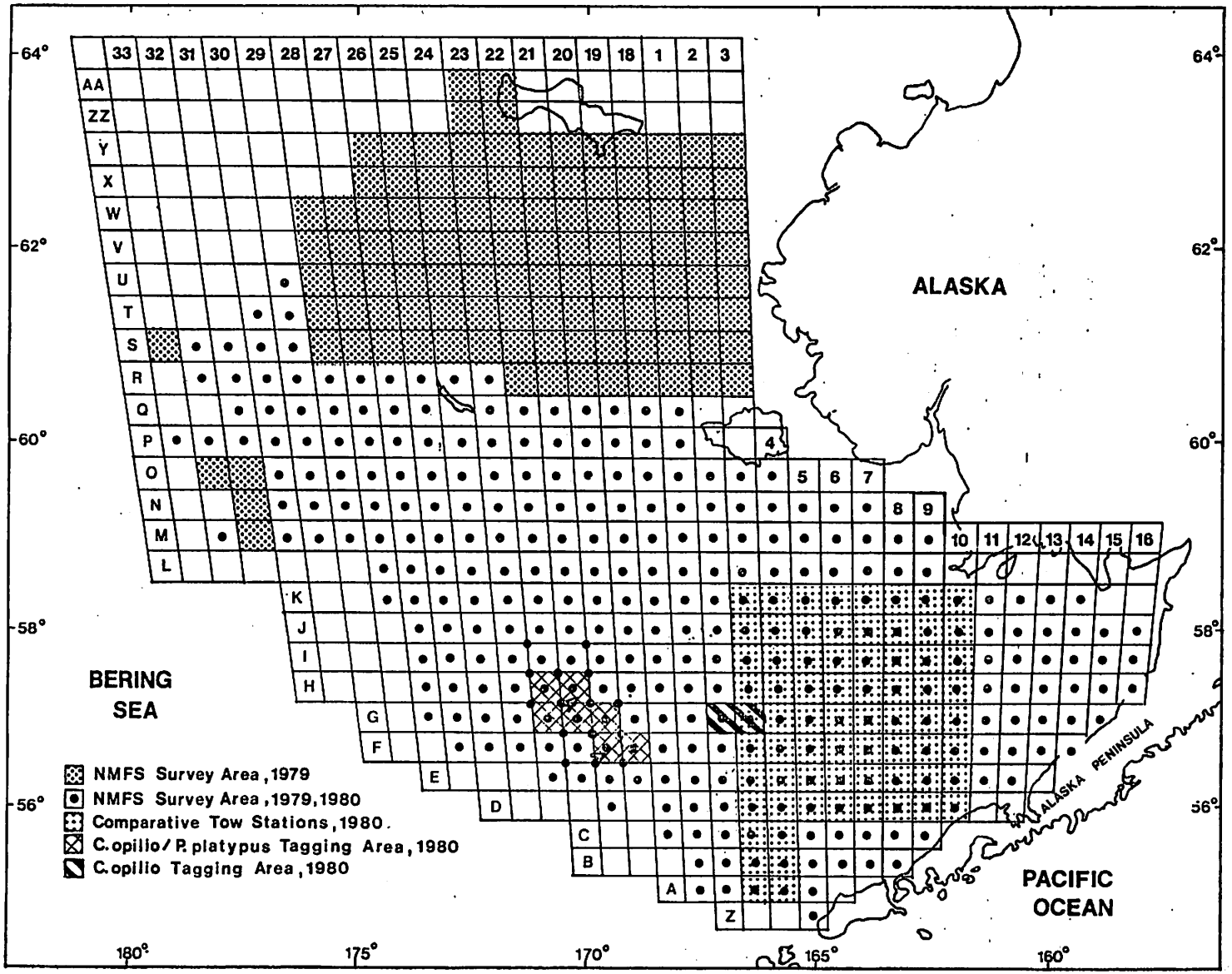

Figure 1. -- NMFS eastern Bering Sea crab survey areas in 1979 and 1980.

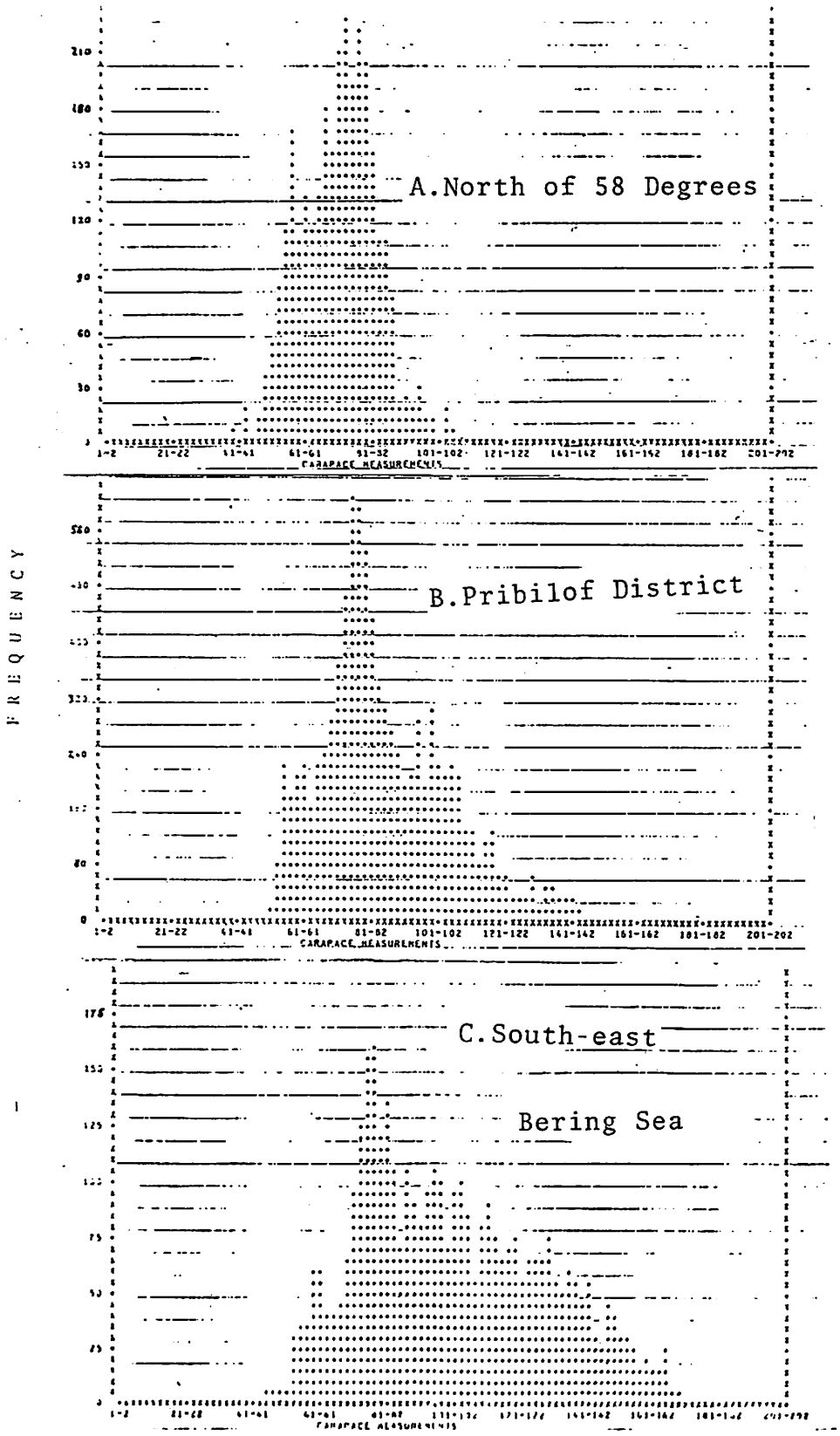

Figure 2-Size frequency distributions for C.bairdi in 1980

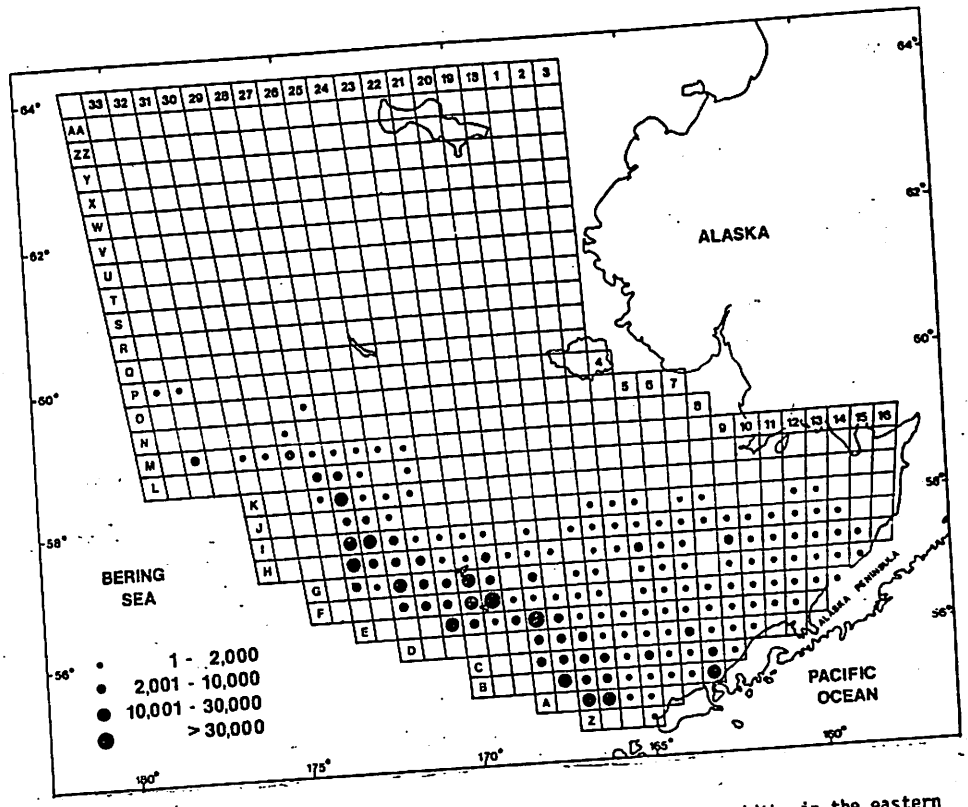

Figure 3a -- Distribution of male C. bairdi 85-129 mm carapace width, in the eastern Bering Sea during May-July, 1980.

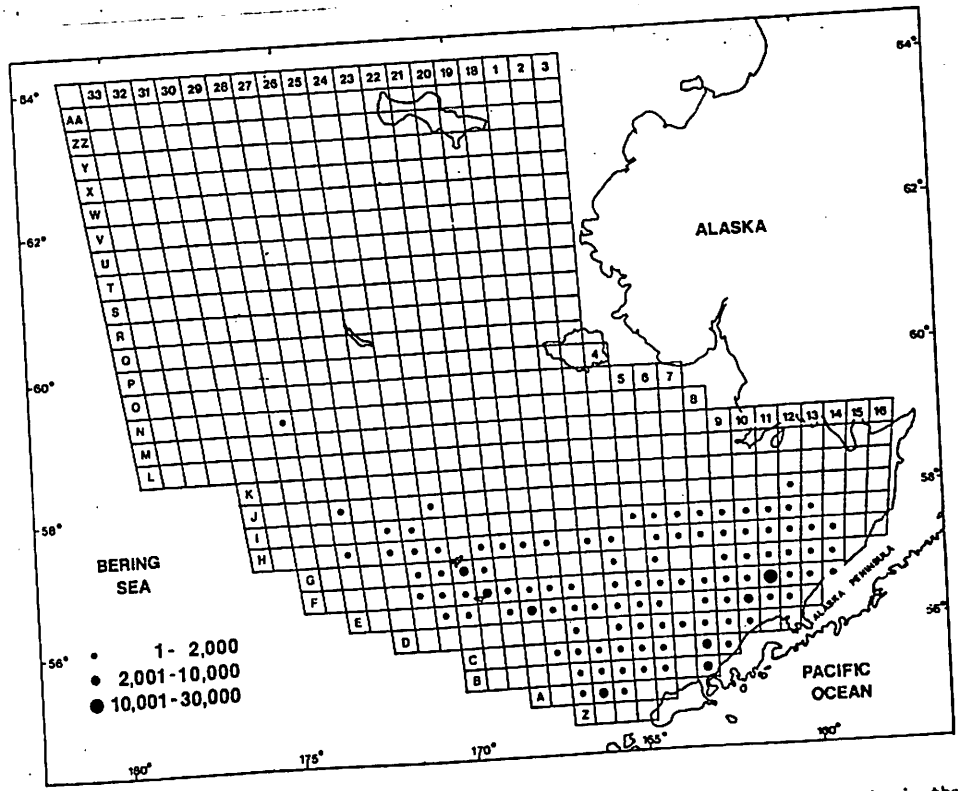

Figure 3b -- Distribution of male C. bairdi greater than 129 mm carapace width, in the eastern Bering Sea during May-July, 1980.

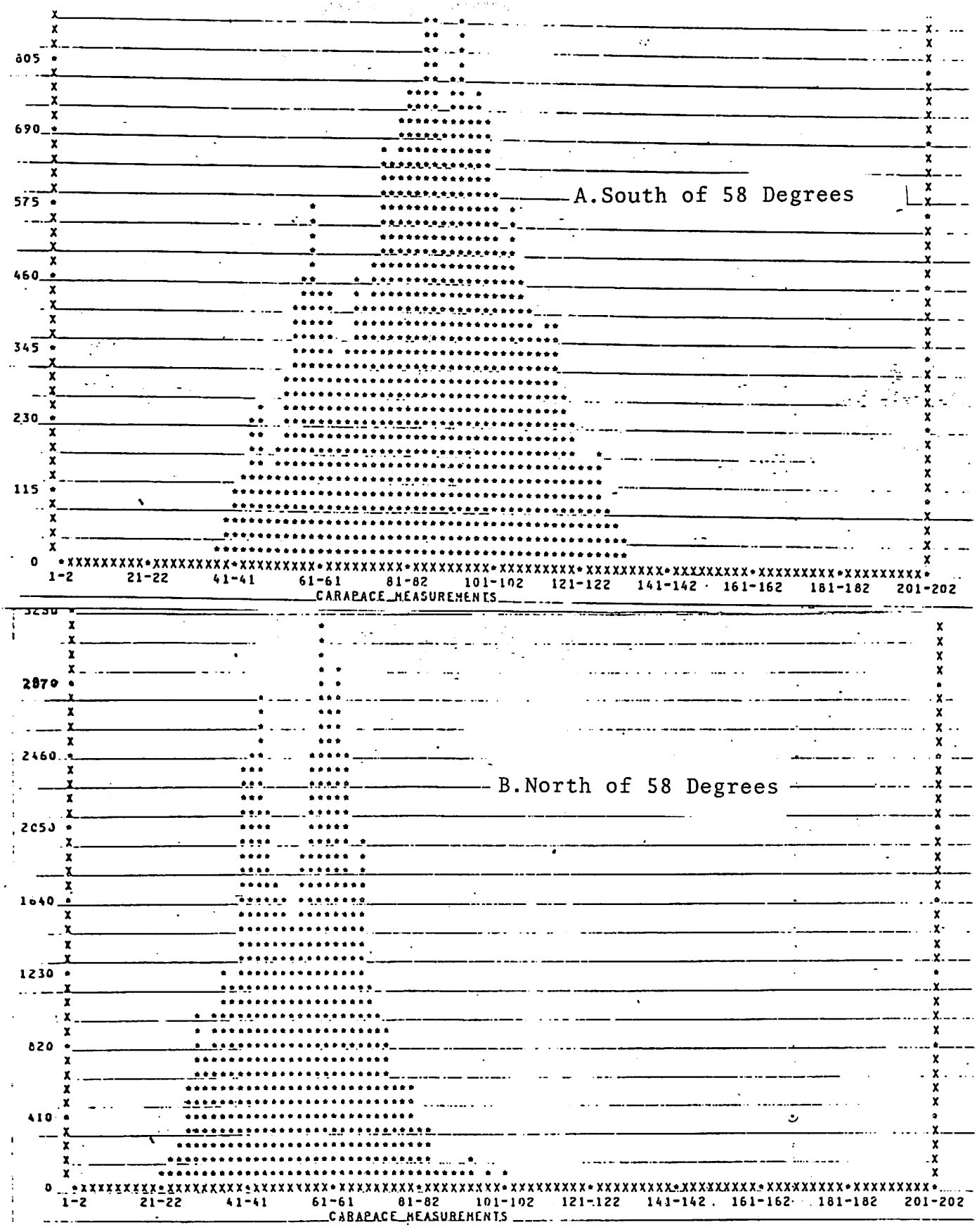

Figure 4- Size frequency distributions for C.opilio in 1980

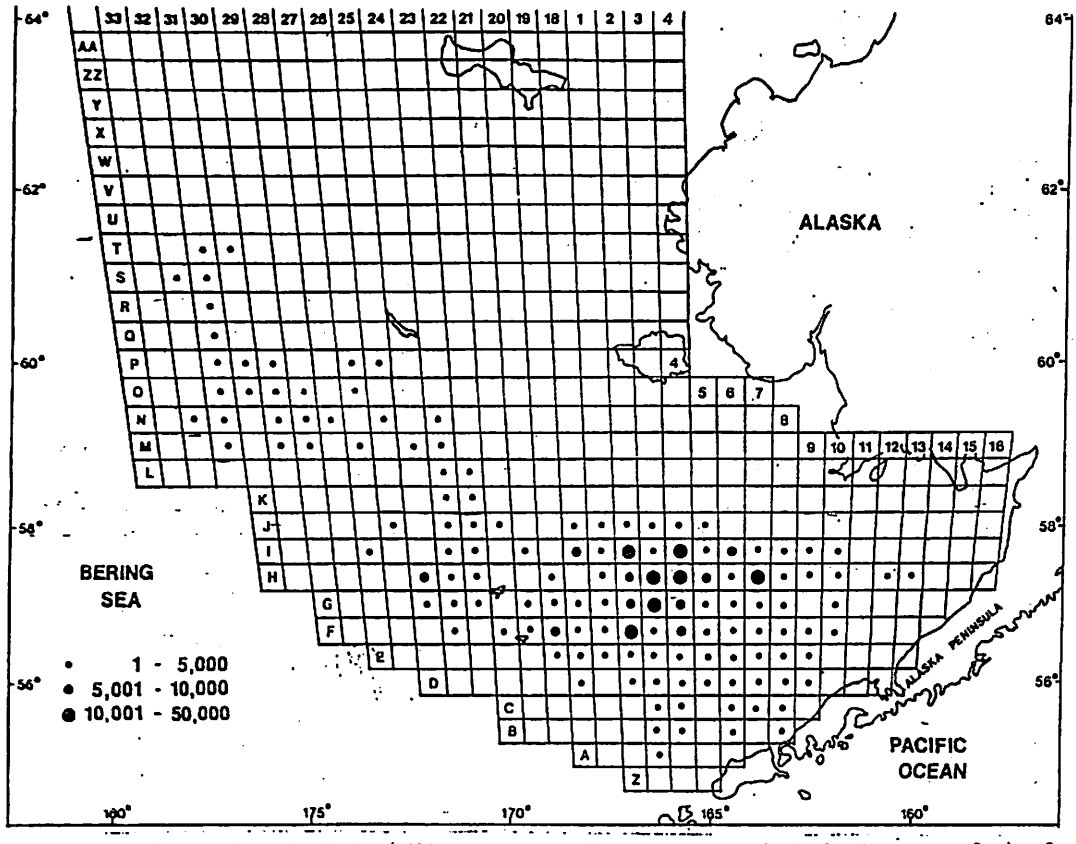

Figure 5a -- Distribution of male C. opilio greater than 109 mm carapace width, in the eastern Bering Sea during May-August, 1979.

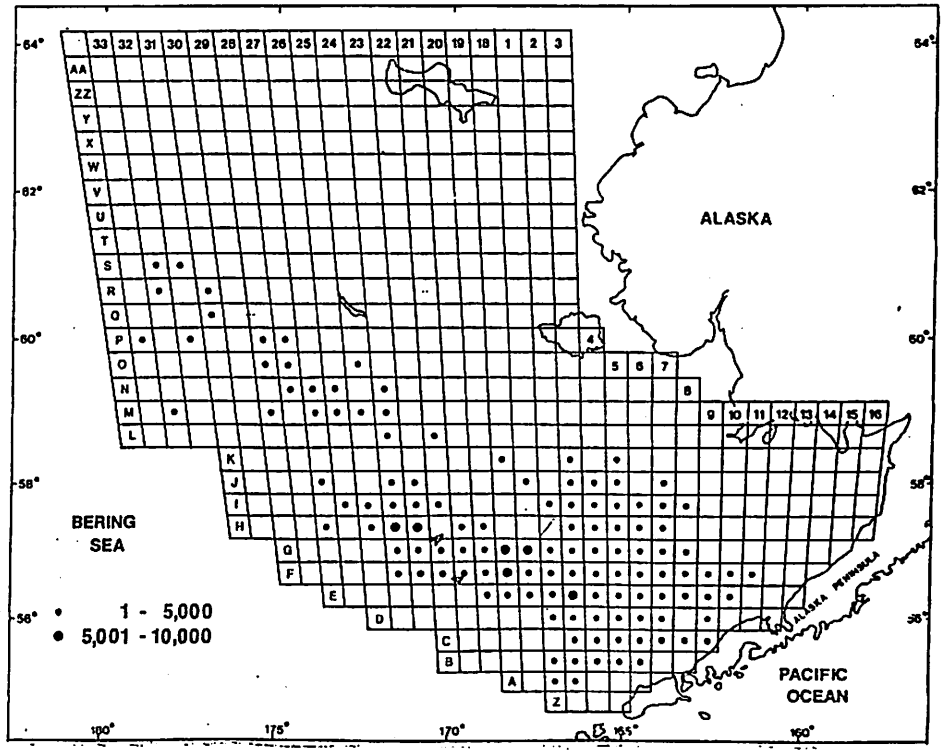

Figure 5b -- Distribution of male C. opilio greater than 109 mm carapace width, in the the eastern Bering Sea during May-July, 1980.

NORTH PACIFIC FISHING VESSEL OWNERS ASSOCIATION

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December 6, 1980

Jim H. Branson
Executive Director
North Pacific Fishery Management Council
P. O. Box 3136DT
Anchorage, Alaska 99510

Dear Mr. Branson:

This letter contains the comments of the North Pacific Fishing Vessel Owners' Association (NPFVOA) on Amendment #7 to the "Fishery Management Plan for the Commercial Tanner Crab Fishery off the Coast of Alaska" which has been proposed by the North Pacific Council.

NPFVOA's members own the majority of vessels which harvest tanner crab in the Bering Sea; many also operate their own vessels. These vessels are large--all are in excess of 90 feet--and represent a substantial capital investment. On the average each vessel is valued at over $2,200,000.

For the Bering Sea management area, NPFVOA favors the Council's specification of optimum yield (OY) for C. bairdi at 34 to 44 million pounds. It also supports the Council's establishment of OY for C. opilio in this area at the level where OY equals the Domestic Annual Harvest (DAH) but does not exceed the Acceptable Biological Catch (ABC). At this level, there would be no foreign harvest of C. opilio.

Council Document #10, "Market Aspects of the Foreign Allocation of C. Opilio Tanner Crab in the Bering Sea under the Framework of the Fishery Conservation and Management Act of 1976," states that the actual catch of C. opilio by the domestic fleet in 1980 "was 39,570,668 pounds or only 35 percent of DAH." NPFVOA attributes the failure of domestic vessels to harvest more C. opilio to two factors: (1) extremely severe weather conditions in the Bering Sea; and (2) a low price for C. opilio, which given the high costs of operating a vessel north of 58° North Latitude did not make it economically feasible for United States fishermen to harvest tanner crab in that area.

NPFVOA agrees with the Council report that "The ability of the domestic industry to utilize the entire ABC for C. opilio in the Bering Sea in 1981 is dependent to an extent on the Japanese markets for US exports of processed crab." It also supports the report's conclusions that (1) a 7,500 metric ton allocation of C. opilio to Japan can be assumed to have a detrimental effect on the Japanese demand for United States tanner crab products, especially C. opilio products; (2) due to market

conditions, the ability of United States companies to fully utilize the resource will depend on whether they can improve their bargaining position relative to the Japanese markets; and (3) there are historical precedents (king crab and C. bairdi) to demonstrate that Alaskan crab fisheries have fully developed after foreign fishing has been eliminated.

At the September 1980 meeting of the North Pacific Council, a representative of the Japanese tanner crab industry may have unintentionally given the domestic industry hope of a brighter future. With regard to the joint venture for tanner crab between the U.S.S.R. and Japan, the Japanese representative stated that the U.S.S.R. is asking the Japanese to buy more tanner crab at a higher price. The Japanese cannot meet this price so they are only purchasing from five to ten percent of what the U.S.S.R. wants them to buy. If the Japanese are unable to harvest C. opilio from the Fishery Conservation Zone and cannot buy all the crab they need from the joint venture with the U.S.S.R., then they may be forced to purchase C. opilio products from the domestic industry.

The Council should be aware that there is already a fishery management plan which establishes an OY lower than maximum sustainable yield in order to stimulate United States exports. On November 9, 1979, the National Oceanic and Atmospheric Administration's Assistant Administrator for Fisheries approved the Mid-Atlantic Council's "Fishery Management Plan for the Butterfish Fishery of the North Atlantic Ocean" which has an OY far below maximum sustainable yield to promote the growth of the domestic butterfish export industry. (See volume 45, page 8030 of the Federal Register of February 6, 1980.)

In the Fishery Conservation and Management Act of 1976 (FCMA), Congress found that

> A national program for the development of fisheries which are underutilized or not utilized by the United States fishing industry...is necessary to assure that our citizens benefit from the employment, food supply, and revenue which could be generated thereby.
> (Emphasis added.)

Therefore, Congress declared that a purpose of the FCMA is

> to encourage the development by the United States fishing industry of fisheries which are currently underutilized or not utilized by United States fishermen....

Furthermore, the Council should remember that OY is defined in the FCMA to mean

> the amount of fish--
> (A) which will provide the greatest overall benefit to the Nation, with particular reference to food production....
> (Emphasis added.)

If the Council establishes the OY for C. opilio at the level it proposes, it will only be carrying out the intent of Congress as it is embodied in the FCMA.

Sincerely,

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PLEASE REPLY TO SEATTLE OFFICE

December 9, 1980

Mr. Jim Branson
Executive Director
North Pacific Fishery Management
Council
Suite 32, 333 West 4th Avenue
Anchorage, Alaska 99510

Dear Jim:

Please find enclosed our comment for consideration by the Council on Amendment No. 7 to the Fishery Management Plan for the Tanner Crab Fishery off Alaska. I prepared this comment on behalf of the Japanese Tanner Crab Association and filed a copy with the Department of Justice, Washington, D.C., where my registration statement under the Foreign Agents Registration Act as an agent for the Japan Fisheries Association is available for public inspection. My registration does not indicate approval of the contents of this comment by the United States Government.

Sincerely,

Jay D. Hastings

enclosure

COMMENTS ON AMENDMENT NO. 7

to the

FISHERY MANAGEMENT PLAN
for the
TANNER CRAB FISHERY OFF ALASKA

submitted by the
Japanese Tanner Crab Industry

Anchorage, Alaska
December 9, 1980

The following comments are being submitted on behalf of the Japanese Tanner Crab Industry for consideration by the North Pacific Fishery Management Council on Amendment No. 7 to the Fishery Management Plan for the Tanner Crab Fishery off Alaska (FMP). These comments support a total allowable level of foreign fishing (TALFF) of 7,500 mt with the foreign fleet restricted to the areas north of 58° N latitude west of 164° W longitude and north of 54° N latitude west of 173° W longitude. We believe this proposal to be consistent with the purpose and policy of the Fishery Conservation and Management Act of 1976 (FCMA) in view of the logistics of the domestic and foreign crab fisheries, the biological status of the Tanner crab resource, and the relationship between domestic and export market development and the foreign TALFF.

LOGISTICS OF THE FISHERY

During the 1978 and 1979 seasons, the Japanese Tanner crab fleet was restricted to the area north of 58° N latitude west of 164° W longitude and west of 173° W longitude in the area south of 58° N latitude. For the 1980 season, the Japanese fleet was restricted totally to the area north of 58° N latitude and west of 164° W longitude in accordance with the Council recommendation for Amendment No. 5 to the plan. With these area restrictions there has been absolutely no gear conflict problems and no competition for fishing grounds between the U.S. and Japanese fleets.

There is a very logical reason for the lack of any conflict between these two fleets. The areas north of 58° N latitude and west of 173° W longitude are logistically and economically unattractive to U.S. Tanner crab fishermen. Larger concentrations of both *C. bairdi* and *C. opilio* stocks are found south of 58° N latitude more conveniently located to U.S. processors. Rarely, if ever, have U.S. crab fishermen ventured into the waters north of 57°30' N latitude and west of 172° W longitude. No convincing evidence has been offered which would suggest that U.S. fishermen will fish these remote areas even if the foreign fishery is

eliminated. Even though the area south of 58° N latitude and west of 173° W longitude was closed to foreign fishing during 1980, U.S. fishermen did not venture beyond 171° W longitude and only one vessel fished west of 170° W longitude for a single landing only. Eaton, Martin F., United States King and Tanner Crab Fishery in the Eastern Bering Sea, INPFC Doc. 2368 at 43 (October, 1980). Until there is convincing evidence that U.S. fishermen will utilize the more remote areas north of 58° N and west of 173° W, the foreign fishery should be permitted to continue fishing surplus Tanner crab in these areas.

STATUS OF THE RESOURCE

The biological status of the Tanner crab resources in the eastern Bering Sea is more than adequate to support both a U.S. and a foreign fishery. According to the 1980 NMFS trawl surveys, the estimated acceptable biological catch (ABC) and optimum yield (OY) for C. bairdi is between 34-44 million pounds. Reeves, J.E., Assessment of Tanner Crab Stocks from the 1980 NMFS Trawl Survey in the Eastern Bering Sea, Northwest and Alaska Fisheries Center (September, 1980). This estimate reflects an improvement in the status of the resource over the previous year. Continued improvement in the condition of the resource is expected since the stock appears to be recovering. Report of the Sub-Committee on King and Tanner Crab, INPFC Doc. 2352-App. 3--11 (1980). Since the entire OY for C. bairdi is reserved for U.S. fishermen, a reasonable increase in the domestic harvest for 1981 can be anticipated.

The ABC for C. opilio in the eastern Bering Sea has been estimated at 91 million pounds from the NMFS survey. Reeves, supra at 1. The highest estimate for DAH during the 1981 season is 64 million pounds. Jaeger, Sig, Preliminary Estimate for the North Pacific Fishery Management Council on the 1981 DAH for C. opilio Tanner Crab in the Bering Sea (September 22, 1980) at 2. This would result in a surplus of approximately 30 million pounds which is more than adequate to support a foreign TALFF of 7,500 mt.

Based upon the best information available, it can be concluded that a 7,500 mt TALFF can be safely taken from the area north of 58° N latitude and west of 173° W longitude without biological harm to the resource. Results of the survey this year show that the stock abundance north of 58° N is stable. Reeves, supra. Although lower abundance was noted on the Japanese fishing grounds during 1980, scientists from both the United States and Japan have concluded that this does not reflect general abundance in the area north of 58° N latitude. INPFC Doc. 2352-App. 3--11 (1980).

Performance of the Japanese fishery north of 58° N latitude for the past 3 years also demonstrates that stocks are stable and capable of supporting a 7,500 mt TALFF. During 1978 and 1979, a 15,000 mt TALFF was taken from this area each year. 7,100 mt was taken from the area during the 1980 season. Catch trends in

both the mothership and land based fisheries have remained stable. INPFC Doc. 2352-App. 3--10 (1980). There is no indication that similar catches cannot be taken from these northern areas in the near future.

RELATIONSHIP BETWEEN MARKET DEVELOPMENT AND THE FOREIGN TALFF

Within the framework of the FCMA, it seems reasonable to assume that a total elimination of the foreign allocation must be based upon a finding, supported by adequate and convincing economic information, that the U.S. industry will be able to utilize the entire ABC for C. opilio within reasonable expectations. This will depend upon development of both domestic and export markets. Richardson concludes that the development of domestic markets can be expected to develop given time and effort. Richardson, Jim, Market Aspects of the Foreign Allocation of C. opilio Tanner Crab in the Bering Sea under the Framework of the Fishery Conservation and Management Act of 1976 (September, 1980). But it is not clear how a reduction in the Japanese catch to zero would improve prospects for the domestic market for C. opilio. The Canadians are evidently already well established in the U.S. northeastern market with a sizeable advantage over Alaskan producers in terms of lower production and transport costs. If the effect of increased demand for American opilio resulting from a zero TALFF were to increase prices to American fishermen as anticipated, the difficulty of further development of the domestic market would be even greater. It is true as Richardson points out that over time a domestic market for U.S. caught opilio can be established and grow, but it is difficult to see how this can take place within the next few years. It is obvious that Richardson himself is very uncertain about the matter since his only justification for the argument that domestic markets will be developed is that it has happened in the past for king crab and for C. bairdi.

With respect to the development of the U.S. export industry, mere supposition that Japanese demand would increase for U.S. caught C. opilio as the result of eliminating the Japanese allocation certainly does not justify the action. Development of the C. opilio export industry will depend upon a number of factors with far greater relevance and importance than elimination of the 7,500 mt allocation to Japan. Quality is one major factor which has not been adequately considered in the development of the U.S. export market. The Japanese market for Tanner crab is sharply segmented. High quality products such as C. bairdi and larger C. opilio processed by air-blast freezing are sold in a quality conscious market. Demand for these products is strong, particularly in the restaurant/hotel trade, and prices have been relatively stable for the past several years. Smaller crabs, including brine-processed C. opilio, are regarded as inferior crab products and sold largely through supermarkets and smaller retail stores. This inferior product sells well only at lower prices, and since it must compete with many other seafood and meat products, quantities demanded are much more sensitive to price. Therefore, it is very doubtful if the U.S.

fishery can supply quality which is of inferior quality as a price acceptable in that market.

A second major factor to be considered in the relationship between Japanese allocation and the development of the U.S. export industry is price. If supply to the Japanese market is cut or the size of the Japanese allocation is not increased, it may appear as if the price would be increased. But even if this should be the case, the key question is whether that increase in price would be sufficient to cover increased costs to the U.S. industry. [illegible] for 1979, the U.S. harvest of pollock was [illegible] and may have further increases in the Japanese allocation. [illegible] (1) increased fuel prices and other transportation costs; (2) higher costs of meeting Japanese quality requirements; (3) increased freight rates to Japan; (4) delaying recovery of higher priced [illegible] and (5) increased interest by U.S. fishermen and processors in bottomfish. No information has been developed on these variable cost factors which would demonstrate that any increased prices for pollock products in Japan would be sufficient to cover these costs.

[illegible] to cover increased costs to the U.S. industry, a reduction in value on the Japanese retail market would ultimately result either in fish and food products would be substituted for the now more expensive pollock products. As previously noted, the retail market for the pollock product is much more sensitive to price than the lower bulk and pollock products which fill the traditional markets. This point is further demonstrated by a recent trend [illegible] and reduced prices for fishery products on the Japanese market [illegible] with a shift away from fish to fish consumption [illegible] meat consumption. (See Figure 17).

[illegible] addition to a reduction in value, additional costs [illegible] would increase [illegible] materialize down a zero fault. Increased stocks from the U.S. would result through possible joint venture arrangements. Two [illegible] joint venture arrangements can be identified [illegible] allocation be withdrawn. Thirdly, there will be a strong incentive to negotiate with the Soviets for increased total warfare fishing in order to avoid a total displacement of [illegible] Japan fleet from the fishery. Reduction in the Japanese allocation by 2,000 mt [illegible] 1979 fishery resulted in [illegible] estimated displacement cost of 11 million dollars. Total elimination of the Japanese fishery would result in an estimated [illegible] over an 8.5 million dollars if alternative fisheries [illegible] within which to develop most of this displaced fishery.

[illegible] U.S. pollock product from the Soviet joint venture [illegible] Japanese consumers [illegible] in this Japanese market. [illegible]

fishery can supply opilio which is of inferior quality at a price acceptable in that market.

A second major factor to be considered in the relationship between the Japanese allocation and the development of the U.S. export industry is price. If supply to the Japanese market is cut by the size of the Japanese allocation, it may appear as if the effect would be to increase prices. But even if this should be the case, the key question is whether this increase in price would be sufficient to cover increased costs to U.S. fishermen and processors. During 1979 prices to U.S. fishermen and processors were sufficient to absorb a sharp increase in the catch of C. opilio. However, even with a 7,500 mt reduction in the Japanese allocation for 1980, the U.S. harvest of opilio did not increase significantly. (See Figure I). There are a number of factors which may explain this situation and may make further increases in the U.S. catch difficult: (1) increased fuel prices which will certainly continue upwards; (2) increased labor and other processing costs; (3) higher costs of meeting Japanese quality requirements; (4) increased freight costs to Japan; (5) probable recovery of higher priced C. bairdi stocks; and (6) increased interest by U.S. fishermen and processors in bottomfish. No information has been developed on these variable cost factors which would demonstrate that any increased prices for opilio products in Japan would be sufficient to cover these costs.

Even assuming that prices in Japan would increase sufficiently to cover increased costs to the U.S. industry, a reduction in sales on the Japanese retail market would naturally result since other fish and food products would be substituted for the now more expensive opilio products. As previously noted, the retail market for the opilio product is much more sensitive to price than the larger bairdi and opilio products which fill the insittutional markets. This point is further demonstrated by a general trend in increased prices for fishery products on the Japanese market which correlates with a similar decline in fish consumption and increase in meat consumption. (See Figure II).

In addition to a reduction in sales, additional exports from Canada and the USSR can be expected should increased prices materialize from a zero TALFF. Increased exports from the USSR would result through probable joint venture arrnagements. Two reasons for expanded joint venture arrangements can be identified should the Japanese allocation be eliminated. Firstly, there will be a strong incentive to negotiate with the Soviets for increased joint venture fisheries in order to avoid a total dislocation of the Japanese Tanner crab fleet and fishermen. Reduction in the Japanese allocation by 7,500 mt for the 1980 fishery resulted in an estimated dislocation cost of 13 million dollars. Total elimination of the Japanese fishery would result in an estimated dislocation cost of 23.2 million dollars if alternative fisheries are not found within which to deploy part of this displaced fishery. (See Table I).

Secondly, the C. opilio product from the Soviet joint venture fishery competes favorably in the Japanese market. Although the

price per metric ton paid to the Soviets appears high, the joint venture catch consists of a high percentage of high valued products such as C. bairdi and king crab. These products are processed on the Japanese factory vessels to ensure high quality through freeze blasting. Transportation costs are also lower since the product is transported to Japan by the Japanese joint venture vessels.

The final factor to be considered in the development of the U.S. export industry is the nature of import-export business and the effect of the exchange rate upon the ability of exports from the U.S. to compete in the Japanese market. This factor has not been addressed by the Council. Since imports involve more complex advance planning and negotiation, together with risks of foreign exchange fluctuations, they are likely to drop in price and/or volume more sharply than domestic products when markets are weak.

The conclusions of the Richardson report suggesting collusion in the Japanese market are all based upon a number of misconceptions of the Japanese market structure. For example, the argument that Japanese importers, with possible assistance from Alaska processors in which Japanese firms have an equity interest, colluded to depress the market for U.S. caught C. opilio is totally incorrect. The number of competing firms in the import market is large, and they are highly competitive with respect to crab products. Control over policy by American firms with Japanese investor interest has remained in the hands of the domestic management. The primary reason for such investment--to secure a stable supply of raw and processed product-- would not be served by engaging in collusive practices to depress markets for U.S. caught C. opilio for which they handle.

CONCLUSION

In summary it can be concluded that the logistics of the U.S. and Japanese fisheries and the biological status of the C. opilio resource support the continuation of the Japanese allocation at 7,500 mt. From an economic perspective, there is no simple relationship between the Japanese allocation of Tanner crab and the development of the U.S. export industry for C. opilio. While reduction of the TALFF to zero would probably strengthen Japanese demand for U.S. crab, it is highly unlikely that the export market would absorb the full amount of the reduction except at prices below levels attractive enough to enable the U.S. fleet to harvest the total ABC. This could only be achieved with a price increase, and that, in turn, will reduce the total quantity taken and increase the possibility of competition from other C. opilio producers. To the extent that the Japanese market strengthens and raises prices to American producers, their ability to dislodge the Canadians in the domestic market or to build a larger domestic market will be further impaired. There are strong reasons to believe that U.S. fishing and processing costs in the Bering Sea for C. opilio operations will continue to rise, raising further doubts about the ability of the U.S. fleet to harvest the full ABC for C. opilio in the near future.

Table 1. Estimated Economic Dislocation of the Japanese Tanner Crab Industry in dollars for 1980 and 1981

	1980	1981
Vessels:		
Mothership	(1) $4.2 mil.	(1) $2.3 mil.
Catcher boats	(9) $4.2 mil.	(4) $1.9 mil.
Land-base vessels		(14) $5.8 mil.
Sub-total	$6.6 mil.	$10.0 mil.
Personnel (Discharge allowances)	(214) $7.1 mil.*	(550) $13.2 mil.**
TOTAL	$13.7 mil.	$23.2 mil.

* Number of crew members dismissed during 1980 totaled 214 and family directly affected totalled 828.

** Number of crew members to be dismissed during 1981 totaled 550 and family directly affected totaled 2,200.

Figure I. Comparison of TALFF with US Export to Japan and Foreign Exchange Rates.

——·——·—— TALFF

--------- US Export to Japan

———————— Exchange Rates

(Note) 1. Processed weight (TALFF is calculated by the Recovery rate of 55%).

2. Material weight related to the processed weight (1).

Figure II. Price and Consumption Index for Fishery and Meat Products in the Japanese Market

Price Index for Fish and Shellfish (fresh and frozen)

Consumption Index for Fish and Shellfish (fresh and frozen)

Price Index for Meat

Consumption Index for Meat

Source: Prime Minister's Office, Statistical Bureau

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Statement by the Delegation of the Association
at the
December, 1980 Meeting
of the
North Pacific Fisheries Management Council
Anchorage, Alaska

We are grateful for the cooperative relationships which have evolved among the leadership of our industry, the members of our Association, our Washington agents and the Council and concerned Federal Government authorities in Alaska. The Fisheries Management and Conservation Act has brought with it the necessity to develop many new and complex systems. We are happy that matters have progressed as well as they have through this year. Now our relationship is to be tested by new and quite unilateral American legislation. We are concerned, but willing as always to make every possible effort to exercise our access to the resources of the Fisheries Conservation Zone in a responsible and cooperative way. Under the appropriate headings below, we seek to review for the Council Members our activities in 1980 and we offer some of our views on current issues.

Quotas

We are most pleased with the 237,984 metric tons of allocations which we have received thus far in 1980. The total represents a substantial improvement in access above that granted us in 1979. The Council is aware, however, that we were the principal losers in the round of 200-mile declarations and nationalistic restrictions which were launched in the North Pacific in the wake of the FCMA of 1976. We lost, of course, our principal fishing grounds of Kamchatka —which had provided us with some 300,000 metric tons of resources yearly. We regret to report that the Japanese have this year cut back our access to resources of pollock off Hokkaido by about 50 per cent. Our requirement for truly efficient use of our fleet in the North Pacific during these times of skyrocketing oil prices is about 400,000 metric tons. We are hopeful that our urgent need for access to the American zone, when viewed against our record of cooperation and good faith, will mean substantially larger quotas for us in 1982.

We offer below a table showing our utilization of Quotas in the FCZ in 1980.

Overall Korean Catches
as of November 29, 1980

(Metric Tons)

	Allocation	Catch	Percentage
Bering Sea & Gulf of Alaska:	185,879	152,151	82%
West	36,755	31,208	85%
East	15,350	554	4%
TOTALS	237,984	183,923	77%

We were hampered in the Gulf of Alaska by the strict gear and other restrictions and were closed out for about forty days beginning in early September because of NMFS belief, based their rarified "best blend" calculations, that we had exceeded sablefish allocations. Our problems in the West Area of the Gulf contributed to our poor catches in the East Area, since captains did not wish to expend fuel to make the additional distance to what is in any case a rocky bottom with relatively unfavorable prospects. The improvement of our record in the Bering Sea depends upon timely and adequate allocations of bycatch -- pacific cod/yellowfin sole.

Fees and Observer Charges

We are quite distressed by the arbitrary and uneconomic charges which are being suggested for imposition on our access to the resources of the FCZ. The doubling of those poundage fees of concern to us which is now under consideration strikes us as beyond the definition of the word "reasonable" as used in the relevant section of the FCMA (Section 204.b.10). We have argued that this proposed action is against the principle of American law that fees must bear a demonstrable relationship to services provided by the American Government -- otherwise they become taxes and, in our case, become taxes without representation. Our fee payments this year have already aggregated $2.5 million and we believe constitute our fair share of the costs of the administration of the American system for conservation of the resource.

We are also now threatened with a substantial increase in the burden of observer costs. Apparently greatly increased observer coverage is to be an American Government objective. The direct costs of the existing program to our fleet were about $1 million in 1980. We estimate the indirect costs (principally voyages to and from Dutch Harbor to embark and disembark observers) at another $2 million. These costs, and the extraordinary increases which are proposed for the future, must be borne by our consumers and by American consumers who purchase the final product made from imports of our frozen pollock block.

Enforcement

Our strong advice to our American friends is that good enforcement does not come from increased surveillance, heavier penalties and resultant increased costs for the eventual fish consumer, but from improved communications. We have had only one warning citation in 1980 and our enforcement slate is, to the best of our knowledge, free and clear. We have undoubtedly enjoyed good fortune in arriving at this situation. But we have also enjoyed full and effective cooperation from the American authorities in getting the word about acceptable practices down to the people on our decks and we ourselves have put a great deal of effort into the program.

We have had the benefit of one visit by a team of Coast Guard and NMFS experts at our invitation and expense. We look forward to welcoming another mission next spring. These missions brief our executives and captains on the details of good practice and alert them to problem areas they have noted in their own enforcement activities. We have translated the entirety of the Foreign Fishing Regulations into the Korean language -- with cross-checks on complex points with Washington experts. When problems arise, we investigate the matter thoroughly and make certain that fines are not simply settled by a corporate comptroller without internal investigation and disciplinary action. We attempt to get to the bottom of complaints by American authorities even when it requires extended communication. A recent complaint by NMFS about alleged failure by us to meet observer pickup appointments was investigated in this manner and found to be without foundation.

Cooperative Efforts

It is important to recognize that the United States has enjoyed a trade surplus with Korea since early 1979 (a surplus of $224 million in the first nine months of 1980 vis-a-vis two-way trade totalling $6.2 billion). Korea is also a developing country under heavy pressure from energy price inflation and its economic growth has suffered severe recent setbacks. Despite these factors, the Korean industry has sought to be responsive to

the new American "fish and chips" diplomacy.

The existing joint venture between Korea Marine Industry Development Corporation and its American partner has picked up momentum in 1980 and KMIDC has purchased almost 10,000 metric tons of American-harvested fish according to recent reports. This joint venture has recently held joint planning sessions and plans for next year include several new approaches which promise increased American sales. Other members of our Association are open to suggestions from appropriate, prospective American partners for further joint venture arrangements. The Government of the Republic of Korea has made it official policy to encourage Korean industry participation in joint ventures.

Although outside the Council's jurisdiction, we might note that we have two joint ventures off California:

- Dongwon Fisheries is operating a venture involving two trawlers and capitalized at $300,000 (of which Dongwon's share is $295,000).

- Samwon Fisheries is operating a venture involving one long-liner (capital of $300,000, Samwon's share is $98,000).

The purchase of American fish outright at the docks or by withdrawal from warehouse is, of course, a normal and uncomplicated way for us to contribute to the development of the United States industry. One of our members, Daerim Fisheries, has formed an American subsidiary which has as its main purpose such commercial purchases. Total Korean imports of American-harvested fish stood at $13,4 million as of August 31 of this year.

Research efforts are one way listed in the FCMA whereby foreign nations can cooperate with American management of the fisheries resources in the FCZ. The Korean research vessel made a voyage in the summer of this year traversing the FCZ and the resultant data is being analyzed for publication and transmittal to the United States Government.
