AGENDA D-4
JULY 1983

M E M O R A N D U M

TO: Council, SSC, and AP Members

FROM: Jim H. Branson
Executive Director

DATE: July 14, 1983

SUBJECT: Tanner Crab Fishery Management Plan

ACTION REQUIRED

Review and final approval of Amendment #9 and further consideration of proposed Amendment #10 to the Tanner Crab FMP.

BACKGROUND

In December 1982 the Council circulated for public comment Amendment #9 that proposed a framework procedure utilizing pre-season notices for setting Tanner crab fishing seasons. This amendment was prepared in response to the continuing difficulties in coordinating federal season dates with those established by the State of Alaska. In January 1983 the Council was notified by the Central office of NMFS that in addition to fishing seasons, the amendment should update the numerical MSY, ABC and OY values because of the close interrelationship that exists between the setting of a fishing season and the resulting attainment of the OY. At the May meeting the Council reviewed and approved for public review an expanded amendment which included updated MSY, ABC and OY ranges. A copy of the amendment is included in your notebooks as item D-4(a). The public comment period began on June 1, 1983 and closes at this meeting. Following review of any public comment the Council is scheduled to approve Amendment #9 for Secretarial review.

At the last meeting, the Tanner crab PMT presented Amendment #10 for Council discussion. This amendment focuses on the regulatory inconsistencies created by the Alaska Board of Fisheries at their spring shellfish meeting. Specifically, the amendment addresses the establishment of two new exclusive registration areas (Alaska Peninsula and Southeastern) and the lowering of the Kodiak pot limit. Following initial review, the Council directed the PMT to expand the amendment by providing additional information for each of the alternatives. The team met with the AP and SSC subgroups in Seattle on June 22-23, 1983, and a copy of their report and the expanded amendment are provided as items D-4(b) and D-4(c), respectively. If the amendment is acceptable, the Council may wish to adopt Amendment #10 for public review.

Amendment #8, "the housekeeping amendment," which eliminated many regulatory inconsistencies that existed between the Tanner Crab FMP, federal regulations and state regulations, began Secretarial review on May 16, 1983. The amendment is progressing smoothly and a decision by the Secretary is scheduled for August 10.

NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
FISHERY MANAGEMENT PLAN FOR THE COMMERCIAL TANNER CRAB FISHERY OFF ALASKA

AMENDMENT #9

Changes to the FMP

I. INTRODUCTION

The North Pacific Fishery Management Council (NPFMC) proposes the following changes to the Fishery Management Plan for the Commercial Tanner Crab Fishery Off Alaska (FMP), as amended by Amendments 1 through 8 (Amendments #1-7 implemented; #8 pending):

1. Revise values for Maximum Sustainable Yield and Allowable Biological Catch for all registration areas.

2. Establish a framework provision for setting Tanner crab fishing seasons.

3. Establish a pre-season notice procedure for adjusting fishing season opening and closing dates.

4. Clarify the description of the Regional Director's field order authority.

II. CHANGES TO THE FMP

1. In the Executive Summary, page viii, Table A, replace the MSY and ABC values with the following:

AREA	MSY lbs	MSY mt	ABC lbs	ABC mt
SOUTHEASTERN				
Southeast	1.7	771	1.0-3.0	454-1,361
Yakutat	1.4	635	0.1-1.0	45-454
PRINCE WILLIAM SOUND	4.3	1,951	1.5-3.5	680-1,588
COOK INLET	4.9	2,223	1.5-3.0	680-1,361
KODIAK	22	9,980	11-33	4,990-14,969
CHIGNIK	4.2	1,905	2-5	907-2,268
S. PENINSULA	6.7	3,039	3-6	1,361-2,722
E. ALEUTIANS	0.9	408	0.1-2.4	45-1,089
W. ALEUTIANS	0.3	136	0.1-2.0	45-2,268
BERING SEA				
C. bairdi	34	15,423	5-28.5 1/	2,268-12,928
C. opilio	31	14,062	20-130 1&2/	9,074-58,983

lbs = millions

1/ lower limit is based on 1983 projected harvests and are subject to minor revision when statistics are finalized.

2/ This harvest range is noticeably broad due to the uncertainty surrounding the size of crab, above the minimum biological size, at which the fishing industry chooses to accept.

2. In Section 3.0, DESCRIPTION OF FISHERY, Part 3.3.2.1 and 3.3.2.2, page 3-9, add to the end of the paragraph entitled "Fishing Seasons" the following:

To meet the objectives of the FMP, social and economic factors, in addition to biological factors may be considered in setting fishing seasons. A framework procedure has been developed for use in setting season dates (see Section 8.3).

3. In Section 8.0, MANAGEMENT REGIME, Part 8.3.1.1, page 8-3, delete the paragraph and add the following:

Open and closed fishing seasons are used to protect Tanner crab during the molting, mating, and growing periods of their life cycle. The season will normally be closed during those periods to protect crab from mortality caused by handling and stress when shells are soft and to maximize product quality by delaying harvest until the shells are filled out. Closed seasons will be set to maximize the reproductive potential of the Tanner crab population based on the following considerations:

- Closed seasons should include molting and post-molting periods until the shells have hardened enough to permit handling with minimal mortality and damage.

- Closed seasons should possibly include other sensitive periods of the life cycle of the crab, when they become known.

In some areas, provision for an open season that conflicts with the preceding conditions may be desirable based on one or more of the following considerations:

- Openings will provide for an exploratory fishery to encourage effort on a stock of low productivity which would otherwise not be fished during a normal season because fishermen would concentrate on more productive stocks.

- An opening may also be justified if adverse environmental conditions such as sea ice covering the fishing grounds prevent utilization of harvestable crab during a normal season even though the opening were during a period that was not optimal relative to the above considerations.

- An opening during a sensitive biological period will be designed to ensure that no irreparable damage will be done to any Tanner crab stock.

The biologically sensitive period in the life cycle of Tanner crab in the FCZ area is generally from spring to fall although the timing for

individual stocks may vary somewhat, allowing some adjustments in seasons. Winter through early spring is generally the optimum period for harvesting crabs from a biological standpoint. However, molting Tanner crab have been found to a certain extent at all times of the year and in every area. Information on the early life history, molting frequency, and mating periods of Tanner crab is scarce and as more becomes known, managers will be able to determine more accurately the biologically sensitive periods for each area.

Tanner crab fishing seasons are established during periods when crab are not molting or reproducing, and when handling mortality should be low and meat content high. These periods may last up to nine months, far exceeding the time required to harvest the available catch. To meet the objectives of FMP, modification of seasons may be made considering socioeconomic as well as biological factors.

Some of the factors the Council may consider in recommending fishing seasons are:

- Deadloss. All Tanner crab must be alive when processing begins. Those dying prior to processing are classed as "deadloss" and discarded. Deadloss increases if crabs are: (1) softshell, (2) not completely filled out, (3) held for long periods in boat tanks or processor holding tanks, (4) holding tanks are contaminated by fresh water, and (5) handled too many times. Seasons should be set when crab are hard and well filled out, and scheduled in relation to other fishing seasons and activities so deliveries and processing are orderly, thereby reducing to a minimum the time a catch is kept in vessel or processor holding tanks. Warm water temperatures and periods when fresh water may be a problem on the surface of bays and harbors should be avoided if possible since both factors increase mortality in holding tanks.

- Recovery rate. Seasons should be scheduled to produce the best possible recovery rate, which is the ratio of finished product to live weight. Since different segments of a stock within a fishing

area may fill out at different times during the acceptable biological season, it is not always possible to harvest all crabs in an area during the best recovery period.

- Weather. Insofar as possible, seasons should be scheduled to avoid severe weather conditions and therefore minimize loss of fishing time, men, ships and equipment.

- Cost. Costs of industry operations are affected by the timing of seasons. Seasons should be scheduled to minimize these costs.

- Other fisheries. Seasons should be scheduled in consideration of other fisheries that will be making demands on the same harvesting, processing, and transportation systems needed in the Tanner crab fishery.

- Coordinated season timing. Seasons should be scheduled in consideration of the need to spread fishing effort, prevent gear saturation in a particular area, and allow participation by all elements of the Tanner crab fleet.

- Enforcement and management costs. Seasons should be scheduled in consideration of the costs of enforcement and management as affected by the timing and area of different Tanner crab seasons and as affected by seasons for king crab and other resources.

4. In Section 8.0, MANAGEMENT REGIME, Part 8.3.1.2, page 8-3, change the heading In-season Adjustment of Time and Area to read Adjustment of Fishing Areas and Seasons of the Tanner Crab Fishery.

5. In Section 8.0, MANAGEMENT REGIME, Part 8.3.1.2, page 8-4, delete the section entitled "NPFMC FINDING ON THE SPECIFICATION OF THE OPTIMUM YIELD AND THE ISSUANCE OF FIELD ORDERS" and replace it with the following paragraph:

In the course of a fishing season, the harvest levels and season opening and closing dates specified under the other provisions of this Plan may be found to require modification in light of newly obtained information. Under such circumstances, it is necessary that the Director, Alaska Region, National Marine Fisheries Service (Regional Director) take prompt action to modify those harvest levels and season opening and closing dates in order to meet the biological, social, and economic criteria of this Plan, or to protect Tanner crab resources from biological harm. The Regional Director is hereby authorized to take such action, using the most expeditious procedures that are permissable under federal law. Before taking such action, the Regional Director must consult with the Alaska Department of Fish and Game and, if possible, with the Council. The Regional Director shall have broad discretion to so design such action as to minimize its effect on portions of the fishery to which the newly acquired information is not relevant, disregarding otherwise applicable management area, district, and section boundaries where he finds this to be appropriate.

6. In Section 8.0, MANAGEMENT REGIME, Part 8.3.1.2, page 8-4, following the new paragraph described in part 5 of this amendment, add the following section:

SPECIFICATION OF OPENING AND CLOSING DATES OF THE FISHING SEASONS BY THE ISSUANCE OF NOTICES

The Council may find it necessary to adjust the season opening and closing dates prior to a Tanner crab fishing season on the basis of biological and socioeconomic considerations discussed in Section 8.3.1.1. These considerations are designed to protect the crab resource during sensitive periods in its lifecycle while optimizing the economic efficiency of the industry. As some of these pre-season adjustments may

be necessary, and implementing a plan or regulatory amendment in a timely manner may not be possible, the use of a notice procedure is authorized.

Following a Council review of proposed season dates and their accompanying rationale, the Council will consider such proposals based on biological and socioeconomic factors. Following this review, any approved changes to existing seasons will be submitted to the Regional Director, NMFS-AK for review and approval. Upon receipt of the new seasons, the Regional Director will publish in the Federal Register a notice to establish new Tanner crab seasons and invite public comment for 30 days on his initial determinations. After considering any comments received, the Regional Director shall publish in the Federal Register a notice of his final determination.

The socioeconomic factors that the Regional Director must consider in addition to biological factors in making his final determination are listed below. It is, however, recognized that the Council and Regional Director may have to consider other factors which are relevant to the conservation and management of Tanner crab and cannot be forecast at this time. Rationale for these factors are found in Section 8.3.1.1.

1. Deadloss
2. Recovery rate
3. Weather
4. Cost
5. Other fisheries
6. Coordinated season timing
7. Enforcement and management costs
8. Development of exploratory fisheries

7. In Section A.3.0, DESCRIPTION OF FISHERY, Part A.3.2.1.3, page A-2, delete the paragraph entitled "Southeast District" and "Yakutat District" and replace with the following:

Southeast District. Beginning in 1968, the market demand for Tanner crab products encouraged an exploratory fishery resulting in a small seasonal

harvest of 223,000 pounds. In 1969/70 season, the fishery expanded, resulting in a harvest of 660,000 pounds that year. Since 1969/70, with the fleet size averaging 33 vessels, harvest have fluctuated from a record high of 2.8 million pounds in 1981/82 to a record low of 849,304 pounds in 1974/75. Historic catch is documented in Table A1.

Yakutat District. Historic catch information indicates the initial harvest of this fishery of 540,580 pounds occurred during the 1972/73 season (Table A1). From 1973/74 through 1981/82, catches have ranged from a high of 2.5 million pounds during the 1979/80 season, to a low of 71,944 pounds in 1981/82. The average harvest since the inception of this fishery is 1.3 million pounds.

8. In Section A.3.0, DESCRIPTION OF FISHERY, Part A.3.2.1.3, page A-2a, delete Table A1 and replace with the new Table A1.

9. In Section A.3.0, DESCRIPTION OF FISHERY, Part A.3.3.2.1 and A.3.3.2.2, page A-4, under Fishing Seasons, add to paragraph 3: In late-1983 a flexible procedure for determining fishing season dates was established for this management area and is described in detail in Section 8.3.

10. In Section B.3.0, DESCRIPTION OF FISHERY, Part B.3.2.1.3, page B-2, delete the second paragraph and replace with the following:

The 1976/77 season produced only 2,321,348 pounds. The newly imposed size limit, a price dispute which delayed fishing and the designation of Prince William Sound as an exclusive registration area may have contributed to this relatively small catch. Since 1976/77, the harvests have remained low, with catches being less than 3 million pounds in recent years.

11. In Section B.3.0, DESCRIPTION OF FISHERY, Part B.3.2.1.3, page B-2a, delete Table B1 and replace with the new Table B1.

12. In Section B.3.0, DESCRIPTION OF FISHERY, Part B.3.3.2.1 and B.3.3.2.2, page B-3, add to paragraph 1: In late-1983 a flexible procedure for

determining fishing season dates was established for this management area and is described in detail in Section 8.3.

13. In Section C.3.0, DESCRIPTION OF FISHERY, Part C.3.2, History of Exploitation, page C-1, delete the second paragraph and replace with the following:

The first substantial effort for Tanner crab in Cook Inlet began in the late 1960s in the Southern district with harvests in the 1.0-1.4 million pound range. During the early 1970s, the Tanner crab fleet expanded into the Kamishak-Barren Islands and Outer/Eastern districts with significant catches taken in both areas (Table C1). Recent year's catches in these districts have averaged 1.6 million pounds in the Southern, 2.1 million pounds in the Kamishak-Barren Islands and 656,000 pounds in the Outer/ Eastern districts.

14. In Section C.3.0, DESCRIPTION OF FISHERY, Part C.3.2.1.3, Catch Trends, page C-2, revise the following:

In the first paragraph, first sentence, change "Table C2" to read "Table C1."

In the second paragraph, first sentence, change "5.6 million pounds" (2,540 mt) to read "5.5 million pounds."

15. In Section C.3.0, DESCRIPTION OF FISHERY, Part C.3.2, History of Exploitation, page C-2a, delete Table C1 and C2 and replace with the new Table C1.

16. In Section C.3.0, DESCRIPTION OF FISHERY, Part C.3.3.2.1 and C.3.3.2.2, Regulatory Measures and Purposes of Measures, make the following revisions:

On page C-3, first paragraph, change "Table C3" to read "Table C2."

On page C-3a, change the numerical heading of "Table C3" to read "Table C2."

Beginning on page C-3 and continuing on to page C-4, add to the third paragraph the following sentence: In late-1983 a flexible procedure for determining fishing season dates was established for this management area and is described in detail in Section 8.3.

17. In Section C.4.0, BIOLOGICAL DESCRIPTORS, Part C.4.3, Catch Effort Data, make the following revisions:

On page C-10, second paragraph, change "Tables C4 and C5" to read "Tables C3 and C4."

On page C-10a, change the numerical heading of "Table C4" to read "Table C3."

On page C-10b, change the numerical heading of "Table C5" to read "Table C4."

18. In Section D.3.0, DESCRIPTION OF FISHERY, Part D.3.2, page D-1a, delete Table D1 and replace it with the new Table D1.

19. In Section D.3.0, DESCRIPTION OF FISHERY, Part D.3.2, History of Exploitation, page D-2, delete the fourth paragraph and replace it with the following:

In 1976 a 5½ inch minimum size limit was established to allow male Tanner crab to mate at least once prior to becoming vulnerable to the fishery. Commercial harvest for the 1975-76 through 1978-79 seasons ranged between 20 and 30 million pounds and has declined since with the 1980-81 season harvest of 11.7 million pounds being the lowest since the early 1970s. The 1981-82 fishery produced 13.8 million pounds with 221 vessels making landings.

20. In Section D.3.0, DESCRIPTION OF FISHERY, Part D.3.2.1.3, Catch Trends, page D3, delete the paragraph and replace it with the following text:

The first year of harvest occurred in 1967 with a catch of 110,961 pounds. Since 1967, commercial harvests have ranged from a high of 33.3 million pounds in 1977/78 to a low of 11.8 million pounds during the 1980/81 fishery. Average harvest from the Kodiak district has been approximately 19.5 million pounds annually. A detailed catch history is provided in Table D-1.

21. In Section D.3.0, DESCRIPTION OF FISHERY, Part D.3.3.2.1 and D.3.3.2.2, page D-5, add to the paragraph entitled Fishing Season the following: In late-1983 a flexible procedure for determining fishing season dates was established for this management area and is described in detail in Section 8.3.

22. In Section E.3.0, DESCRIPTION OF FISHERY, Part E.3.2, History of Exploitation, pages E-1 through E-2b, delete all the text and Tables E1, E2 and E3 and replace it with the following text and new Tables E1, E2, E3a, and E3b.

The Tanner crab fishery in the South Peninsula district began in 1967 with a catch of 5,000 pounds. As in other areas of the westward region, the early catch was incidental to the king crab harvest. The directed fishery for Tanner crab developed later, during periods when king crab fishing was closed. During the 1973/74 season a major increase in fishing effort took place and 9.5 million pounds were harvested. Since that time seasonal harvests have fluctuated between 3.3 and 11.2 million pounds (Table E1). Effort, measured by seasonal pot lifts, has increased steadily. South Peninsula Tanner crab stocks were relatively stable from 1974 through 1977. Starting in 1976, survey catches of sub-legal male crab declined and have remained at low levels since. Commercial catch per unit of effort (CPUE) has declined in a manner consistent with survey results. Since 1980-81 the population has stabilized supporting a fishery of 3 to 4.5 million pounds.

The Tanner crab fishery in the Chignik district developed separately from South Peninsula. Prior to 1974, catches were no greater than 800,000 pounds. Since the 1973/74 season, harvests have fluctuated between 2.5 and 6.9 million pounds per year (Table E2). Based on the historical catch and relative effort, an ABC/OY value set at 5 million pounds existed until 1983. In that year the ABC/OY value was changed to a range of 2 to 5 million pounds as a result of a trawl survey conducted in the area.

The Eastern Aleutian district is apparently a marginal habitat for Chionoecetes bairdi, as the crab are only found in commercial quantities in a few of the major bays and inlets. This fishery is rather small and although the 1978 season produced a record 2.4 million pounds of C. bairdi, the seasonal catches have usually been less than a million pounds (Table E3a). The fishery began with boats fishing the waters close to Akutan and Unalaska/Dutch Harbor but has since expanded to include nearly all areas known to be inhabited by Tanner crab. Vessel effort over the past few years has increased as more locally owned (and generally smaller) vessels have entered the fishery (Table E3a). The decline of C. bairdi stocks in the Bering Sea has also caused increased effort in the area.

In the Western Aleutian district, Tanner crab have never been an important commercial species and most landings are incidental to the king crab fishery. Annual catches for the years 1974 through 1982 have not exceeded 839,000 pounds (Table E3b).

23. In Section E.3.0, DESCRIPTION OF FISHERY, Part E.3.3.2.1 and E.3.3.2.2, page E-4, add to the paragraph entitled Fishing Seasons the following: In late-1983 a flexible procedure for determining fishing season dates was established for this management area and is described in detail in Section 8.3.

24. In Section F.3.0, DESCRIPTION OF FISHERY, Part F.3.2.1, Domestic Fishery, page F-1, replace the first paragraph with the following paragraph:

United States fishermen entered the Bering Sea in 1947 to harvest red king crab, Paralithodes camtschatica. The first reported catches of Tanner crab were made in 1968 and were incidental to the king crab harvest. In 1974, a directed Tanner crab fishery was started with the target species being Chionoecetes bairdi. The fishery has grown dramatically. Since 1974 harvests of C. bairdi have ranged from approximately 11 million pounds during 1981/82, to 70.2 million pounds in 1975 (Table F1). With the decline in C. bairdi stocks, the fishing industry began marketing in 1977, the smaller C. opilio Tanner crab. A C. bairdi harvests decreased, catches of C. opilio increased with harvest ranging from 1.3 million pounds in 1977/78 to 34.4. million pounds in 1980/81.

25. In Section F.3.0, DESCRIPTION OF FISHERY, Part F.3.2.1.3, Catch Trends, page F-2, delete the second paragraph and replace it with the following:

An additional perspective in the catch trend of the Bering Sea Tanner crab is shown in comparisons of the 1978 C. opilio catch of 1.8 million pounds and the 1980 catch of over 52.7 million pounds (Table F1).

26. In Section F.3.0, DESCRIPTION OF FISHERY, Part F.3.2.1.3, page F-3a, delete Table F1 and replace it with the new Table F1.

27. In Section F.3.0, DESCRIPTION OF FISHERY, Part F.3.3.2.1 and F.3.3.2.2, add to the paragraph entitled Fishing Season the following: In late-1983 a flexible procedure for determining fishing season dates was established for this management area and is described in detail in Section 8.3.

Table A1. Statistical Area A (Southeast-Yakutat) Tanner crab commercial catches, 1961 to present.[1]

Year/Season	Southeast Catch in Pounds	Southeast Number Vessels	Yakutat Catch in Pounds	Yakutat Number Vessels	Total Statistical Area A Catch in Pounds	Total Statistical Area A Number Vessels
1961	6,800	-	-	-	6,800	-
1962	7,820	-	-	-	7,820	-
1963	-	-	-	-	-	-
1964	13,940	-	-	-	13,940	-
1965	-	-	-	-	-	-
1966	-	-	-	-	-	-
1967	2,733	-	-	-	2,733	-
1968	109,220	-	-	-	109,220	-
1968/69	223,045	33	-	-	223,045	33
1969/70	660,037	31	-	-	660,037	31
1970/71	166,618	12	-	-	166,618	12
1971/72	656,661	25	-	-	656,661	25
1972/73	1,282,309	38	540,880	6	1,823,189	44
1973/74	1,309,673	44	1,872,357	11	3,182,030	55
1974/75	849,304	41	1,997,199	13	2,846,503	54
1975/76	2,157,752	28	1,724,649	3	3,882,401	31
1976/77	2,540,181	32	996,650	5	3,506,831	37
1977/78	2,085,151	32	998,646	6	3,083,797	38
1978/79	1,547,887	33	1,606,848	15	3,154,735	48
1979/80	1,736,247	42	2,474,089	14	4,210,336	56
1980/81	1,788,800	44	700,200	16	2,489,000	60
1981/82	2,845,983	46	71,944	4	2,917,927	50
1982/83	962,398	85	44,199[2]			

[1] Most recent year's data should be considered preliminary.

[2] Season in progress, landings shown are through March 1, 1983.

Table B1. Prince William Sound Area historical Tanner crab catch in pounds, by season.

Season	Inside	Outside	Total	Vessels
1968-69			1,235,613	
1969-70			1,284,597	
1970-71			4,159	
1971-72			7,788,498	
1972-73			13,927,868	
1973-74	1,658,000	8,500,000	10,158,000	
1974-75[1/]	1,187,000	2,667,000	3,854,000	
1975-76	3,322,482	3,810,262	7,132,744	

	Northern	Hinchinbrook	Western	Eastern		
1976-77[2/]	782,048	766,650	701,725	70,925	2,321,348	23
1977-78	994,721	1,161,831	2,079,549	570,573	4,806,674	38
1978-79	649,977	708,562	2,248,545	3,443,471	7,050,555	51
1979-80	140,228	332,583	1,462,059	4,057,847	5,992,717	49
1980-81	152,196	812,352	1,561,207	250,076	2,775,831	30
1981-82	351,139	722,834	1,503,253	288,425	2,865,651	29

1/ No concentrated effort until February 1975.
2/ New districts established and first season of the minimum legal size.

Table C1. Final Tanner crab catches by guideline harvest level season by district for Cook Inlet.

GUIDELINE HARVEST LEVEL	SOUTHERN DISTRICT (3,000,000 lbs)	KAMISHAK/ BARREN IS. (4,500,000 lbs)	OUTER/EASTERN DISTRICT (3,500,000 lbs)	TOTAL (11,000,000)	NUMBER OF VESSELS	NUMBER OF LANDINGS	AVG.CATCH PER LANDING (lbs)
Season							
1968-69	1,388,282	12,398	816	1,401,496			
1969-70	1,147,154	71,196	104,191	1,322,541			
1970-71	1,046,803	541,212	3,000	1,591,015			
1971-72	2,462,956	974,962	804,765	4,242,683			
1972-73	2,935,662	3,361,023	1,266,937	7,563,622			
1973-74	1,387,535	4,689,251	1,891,021	7,967,807			
1974-75	967,762	3,150,462	656,660	4,774,884			
1975-76	1,339,245	3,281,084	850,964	5,471,293	57		
1976-77	2,009,633	1,765,926	824,520	4,600,079	67		
1977-78	2,806,568	2,077,092	502,049	5,385,709	92	1,429	3,769
1978-79 1/	2,323,420	2,713,339	694,728	5,731,487	77	1,213	4,725
1979-80 1/	1,134,940	3,338,623	595,645	5,069,208	68	660	7,681
1980-81 1/	1,047,680	1,757,331	463,201	3,268,212	52	657	4,974
1981-82 1/	548,529	1,286,332	524,897	2,359,758	51	475	4,968
Total	22,546,169	29,020,231	9,183,394	60,749,794			
Average	1,610,440	2,072,874	655,957	4,339,271	66	887	5,223

1/ Preliminary

Data Source: Final Computer runs.

Table D1. Commercial catch and effort for[1] Tanner crab (Chionoecetes bairdi) Kodiak Management District, 1967-1982.

Year	Vessels	Lndgs.	No. Crab	No. Pounds	Pots Lifted	Avg. Wt.	CPUE	Price Per Lb.
1967		83		110,961				.07
1968		817		2,560,687				.10
1969	85	955		6,827,312	72,748		43	.11
1969-70[2]	67	833	3,237,224	8,416,782	78,266	2.6	42	.11
1970-71	82	453	2,686,067	6,744,163	60,967	2.5	44	.11
1971-72	46	505	3,878,618	9,475,902	65,907	2.4	59	.13
1972-73[3]	105	1,466	13,609,668	30,699,777	188,158	2.3	67	.17
1973-74[3]	123	1,741	11,857,573	29,820,899	217,523	2.5	59	.20
1974-75[4]	74	471	5,459,940	13,649,969	73,826	2.5	83	.17
1975-76[5]	104	1,168	10,748,958	27,336,911	199,304	2.5	64	.20
1976-77[6]	102	998	7,830,727	20,720,079	164,213	2.6	48	.33
1977-78[7]	148	1,483	12,401,243	33,281,472	251,621	2.6	49	.43
1978-79[7]	218	1,225	10,702,829	29,173,807	275,455	2.7	38	.55
1979-80[8]	211	1,385	6,813,128	18,623,875	282,946	2.7	24	.55
1980-81[9]	188	771	4,398,631	11,748,629	174,351	2.7	25	.65
1981-82[9]	221	950	5,413,467	13,756,159	230,403	2.5	24	1.65
TOTAL	-	13,449	99,038,073	253,448,424	2,262,940	-	-	-
AVERAGE	130	1,035	7,618,313	19,496,033	174,072	2.5	48	.40

[1]Data Source: Alaska Department of Fish and Game Annual Board of Fish and Game Reports and Annual Kodiak Area Management Report
[2]Fishing year July 1 - June 30.
[3]Legal season November 1 - June 30. Season terminated May 15 due to onset of mating period.
[4]Legal season November 1 - April 30.
[5]Legal season January 1 - April 30.
[6]Legal season January 1 - May 15.
[7]Legal season January 5 - May 15.
[8]Legal season January 22 - May 15.
[9]Legal season February 10 - May 15.

Table E1. Eight year comparison of Tanner crab catch statistics for South Peninsula District by fishing season, 1973-74 through 1981-82.

Year	Vessels	No. of Landings	No. Crab	No. Pounds	Pots Lifted	Average Weight	CPUE
1973-74	36	488	3,981,135	9,503,366	70,047	2.5	57
1974-75	44	131	2,053,530	5,195,800	38,153	2.5	54
1975-76	36	217	4,434,381	11,201,941	59,377	2.5	75
1976-77	28	389	2,524,565	6,773,838	63,143	2.7	40
1977-78	36	374	2,847,948	7,446,270	70,587	2.6	40
1978-79	48	332	3,267,122	8,684,408	82,374	2.7	40
1979-80	61	363	2,581,544	3,961,251	96,989	2.7	27
1980-81	43	268	1,274,539	3,294,106	59,560	2.6	21
1981-82	72	365	1,815,060	4,589,042	81,008	2.5	22

Table E2. Eight year comparison of Chignik District Tanner crab catch statistics, 1973-74 through 1981-82.

Year	Vessels	No. of Landings	No. Crab	No. Pounds	Pots Lifted	Average Weight	CPUE
1973-74	15	141	1,643,669	4,202,671	32,067	2.6	51
1974-75	25	91	1,438,508	3,649,444	22,675	2.5	63
1975-76	35	288	2,724,509	6,926,161	52,381	2.5	52
1976-77	21	141	2,098,226	5,672,919	40,604	2.7	52
1977-78	32	140	1,725,042	4,693,830	38,414	3.8	45
1978-79	39	126	926,253	2,536,105	28,378	2.7	33
1979-80	42	155	2,340,004	3,517,920	54,627	2.6	25
1980-81	24	112	1,534,847	3,653,723	44,022	2.4	35
1981-82	45	174	1,343,500	3,240,576	47,830	2.4	28

Data Source: 1983, Alaska Department of Fish and Game, Westward Region Shellfish Report to the Alaska Board of Fisheries, Kodiak, AK. 330 pp.

Table E3a. Chionocetes bairdi fishery statistics from the Eastern Aleutians District, 1974-82.

Year	No. of Landings	Pots Lifted	No. Crab[1/]	No. Pounds[1/]	CPUE	Average Weight	Vessels	Average Keel Length
1974	14		210,539	498,836	60	2.4	6	N/A
1975	2	758	32,612	71,874	43	2.2	2	78.5
1976	13	4,646	219,166	534,295	47	2.4	8	89.8
1977	48	11,300	572,792	1,301,654	51	2.3	12	81.0
1978	185	27,863	1,076,144	2,429,535	39	2.3	14	61.5
1979	174	18,618	542,081	1,280,115	29	2.4	20	58.4
1980	107	18,040	352,819	886,487	20	2.4	18	59.5
1981	119	21,771	264,238	654,514	12	2.4	29	71.6
1982	138	30,109	332,260	739,694	11	2.2	31	70.8

1/ Deadloss included beginning 1980.

Table E3b. Tanner crab fishery statistics from the Western Aleutians District by year.

Year	Vessels	No. of Landings	No. Crab	No. Pounds[1/]	Pots Lifted	Average Weight	CPUE
1974	7	12	31,079	71,887	2,390	2.3	13
1975	1	1	1,216	3,350	25	2.8	49
1976	2	2	24,977	62,180	671	2.5	37
1977		----------	NO FISHING	----------			
1978	6	7	103,190	237,512	2,700	2.3	38
1979	6	9	84,129	197,244	4,730	2.3	18
1980	10	12	147,843	337,397	5,952	2.3	25
1981	9	23	95,102	220,716	7,327	2.3	13
1982[2/]	17	43	364,164	838,697	21,910	2.3	17

1/ Deadloss included.
2/ Season open January 15, to June 15, 1982.

Data Source: 1983, Alaska Department of Fish and Game, Westward Region Shellfish Report to the Alaska Board of Fisheries, Kodiak, AK. 330 pp.

Table F1. Historic United States Tanner crab catch in the Bering Sea.

Year		No. of Landings	No. Crab[1/]	No. Pounds[1/]	Pots Lifted	Average Weight	CPUE[2/]
1968		7	64,000	179,000	14,000	2.8	5
1969		131	3,533,000	10,089,000	298,000	2.9	12
1970		66	4,823,000	10,147,000	164,000	2.1	29
1971		22	613,000	1,661,000	73,000	2.7	8
1972		30	426,000	1,192,000	67,000	2.8	6
1973		44	1,329,000	3,019,000	165,000	2.3	8
1974		69	25,318,000	50,442,000	220,000	2.0	115
1975		80	27,738,000	70,284,000	385,000	2.5	72
1976		305	8,949,886	22,341,475	141,179	2.5	63
1976-77		541	20,250,858	51,454,056	297,171	2.5	68
1977-78	bairdi	823	26,189,000	66,227,940	508,769	2.5	51
	opilio	38	1,267,546	1,716,124	13,247	1.4	96
1978-79	bairdi	817	16,726,518	42,547,174	402,697	2.5	42
	opilio	490	21,567,656	31,427,902	190,746	1.5	113
1979-80	bairdi	804	14,664,321	36,557,869	488,434	2.5	30
	opilio	596	24,286,779	39,572,668	255,022	1.6	95
1980-81	bairdi	761	11,887,213	29,732,086	559,626	2.5	21
	opilio	867	34,415,322	52,750,034	435,742	1.5	79
1981-82	bairdi	791	4,830,980	11,008,779	490,099	2.3	10
	opilio	803	24,084,984	29,351,474	469,091	1.2	51

1/ Deadloss included.
2/ CPUE is crab per pot lift.

Data Source: 1983, Alaska Department of Fish and Game, Westward Region Shellfish Report to the Alaska Board of Fisheries, Kodiak, AK. 330 pp.

AGENDA D-4(b)
JULY 1983

TANNER CRAB PLAN MAINTENANCE TEAM MEETING SUMMARY
June 22-23, 1983
Seattle, Washington

As directed by the Council at its last meeting, the Tanner Crab Plan Maintenance Team (PMT) met to evaluate the comments received on draft Amendment #10 and to expand the supporting rationale of the proposed alternatives where necessary. In addition, the PMT's agenda included discussion of the following: the proposed Golden king crab size at maturity study; problems with definitions used in both king and Tanner crab regulations; and methods of obtaining better information regarding the incidental by-catch of halibut in crab pots. The meeting was chaired by Steve Davis, with Fred Gaffney, Ray Baglin and Jerry Reeves in attendence. Also attending were Don Bevan, Bob Alverson, Joe Kurtz and Richard Goldsmith representing the SSC and AP subgroups.

The PMT spent the first half of the meeting discussing recent Board of Fisheries action designating the Southeast and South Peninsula Registration areas as exclusive and lowering the Kodiak pot limit from 250 to 200 pots. Comments received by both the AP and SSC at the last meeting highlighted the controversial nature of these issues and focused on the need of further biological and socioeconomic rationale for the proposed measures. Following this discussion, and after receiving many suggestions from the subgroup members, the PMT later redrafted the supporting rationale for all the alternatives presented in Amendment #10. The revised amendment is included in your notebooks for your review.

The PMT reviewed the study proposal entitled "Growth and Size at Maturity of Golden (Brown) King Crab, Lithodes aequispina." The team agreed with the SSC that the proposed study area should include the Bering Sea, since this area is of more immediate concern to the Council. Apparently, the authors of the proposal are revising the study to include the Bering Sea. The team will comment further following receipt of the revisions.

A part of the meeting was devoted to a discussion on ways to eliminate the confusion surrounding the terms "exclusive," "super-exclusive" and

"non-exclusive" registration areas. These terms are used frequently in the king crab and Tanner crab FMPs, and in state and federal regulations. The definitions of each term vary, depending on what fishery they are being applied. The PMT concluded that the best way to eliminate this problem is to develop a Board proposal which will redefine the area designations and standardize the terms used in both king crab and Tanner crab management.

Since the preparation of Tanner crab Amendment #8, which included a proposed side-loading pot prohibition for the Yakutat district, the PMT has been concerned over the quality of the incidental halibut by-catch data. Currently, the North Pacific Halibut Commission uses incidental catch rates observed by ADF&G during their pot index survey conducted in the Kodiak area. These catch rates are then applied to the number of pots used in the king and Tanner crab fisheries to generate a theoretical by-catch. The problem with this method is that the index surveys are conducted during the summer months, a time when there is no open crab season and halibut are known to migrate closer to shore. Incidental catch rates of halibut generated in this manner will likely differ from those calculated during a fall or spring crab fishery. The team feels that it is important that in-season halibut by-catch data be collected to more accurately assess halibut by-catch. The PMT has been approached by the GOA Groundfish PMT to work jointly on designing a data gathering program. Both groups hope to have a program proposal available to the Council sometime this fall.

NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
MANAGEMENT RECOMMENDATIONS AND CONSIDERATIONS
FOR THE TANNER CRAB FISHERY IN THE FCZ OFF ALASKA
PROPOSED AMENDMENT #10

I. INTRODUCTION

The Magnuson Fishery Conservation and Management Act of 1976 (MFCMA) requires that stocks of Tanner crab be managed as a unit throughout their range. The Tanner crab fishery off Alaska extends into the waters of both state and federal jurisdictions, and the management objectives and measures of both zones should, therefore, be compatible. The intent of the Fishery Management Plan (FMP) is to manage the Tanner crab resources off Alaska in a manner that is consistent with the State of Alaska's management regime and MFCMA National Standards while promoting conservation and allowing full utilization of the resource for food production.

In March 1983 the Alaska Board of Fisheries (Board) reviewed proposed fishery regulations for the 1983-84 Tanner crab fishery. These proposals were submitted by the Alaska Department of Fish and Game and the fishing industry. Following review of the proposals and public testimony, the Board took regulatory action which has created inconsistencies between state and federal fishery regulations. While some inconsistencies can be eliminated in proposed FMP Amendment #9 currently undergoing public review, others remain. To remove these differences the Council is considering adopting similar proposals concerning changes to Registration Areas and Pot Limits. Amendment #10 to the FMP represents the changes necessary to bring state and federal regulations into conformity.

II. REGULATORY PROPOSALS

Specific regulatory alternatives for the Tanner crab fishery have been submitted by the Tanner crab Plan Maintenance Team and individuals and are listed below. Alternatives that will bring the FMP and federal regulations into exact conformity with state regulations are indicated by an asterisk (*).

The Council wishes to put these proposals out for public review and discussion. Based on public testimony and any new information, the Council will approve the final amendment at their September meeting.

A brief discussion of each proposal and its alternative is included where necessary to provide background information.

A. Registration Areas

*1a. Create a new exclusive registration area to be named Alaska Peninsula (Area M).

Discussion: This proposal combines the non-exclusive Chignik and South Peninsula districts of Registration Area J (Westward) and establishes a new exclusive registration area (Figure 1). The new area will be named Area M - Alaska Peninsula and will consist of the two districts, Chignik and South Peninsula. Area M will have as its eastern boundary the longitude of Cape Kumlik (157°27'W. long.) and as a western boundary, a line extending south from Scotch Cap Light. The new registration area mirrors in both size and location the Alaska Peninsula area currently in use by the state for managing king crab.

If the Council adopts this proposal, they would also be designating this new area as an exclusive registration area. As with the other federal and state exclusive registration areas (Cook Inlet and Prince William Sound), vessels registering to fish Tanner crab in an exclusive area will only be allowed to fish that area and no other area. This differs from the exclusive registration areas defined in the king crab fishery where vessels are allowed to fish in one exclusive area and in any other non-exclusive registration area. The current federal and state definition of exclusive registration areas in the Tanner crab fishery are identical to the definition of super-exclusive registration areas adopted by the state for some of the Gulf of Alaska king crab fisheries. Prior to the Board's action in March 1983, the Chignik and South Peninsula districts were designated non-exclusive, meaning that vessels registered to fish these area districts could move to any other non-exclusive area following a change in vessel registration. Adoption of the exclusive

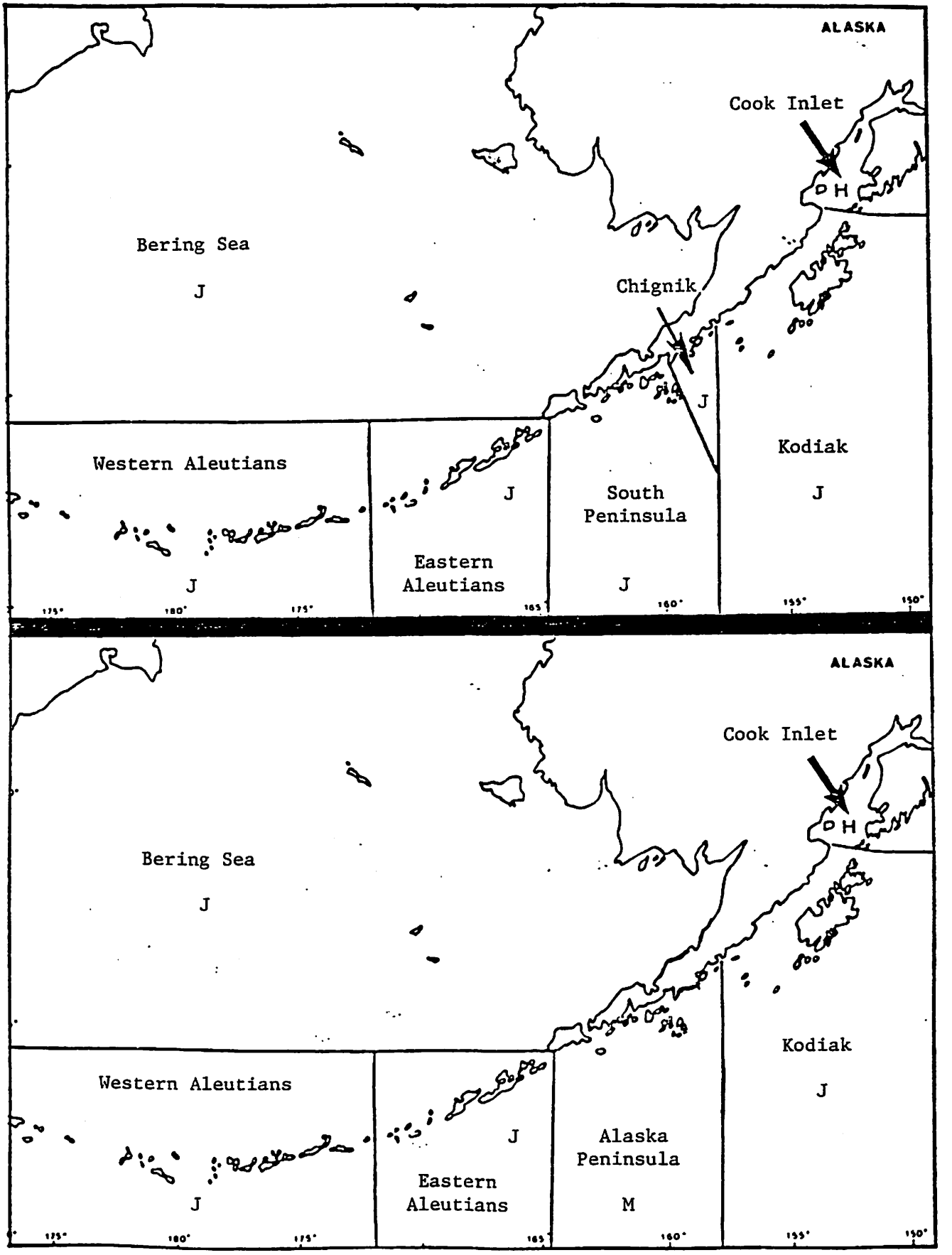

Figure. 1. Current(top) and New(below) Registration Areas being proposed in this amendment. The Alaska Peninsula Area would be designated as exclusive while the other areas would keep their non-exclusive status.

status could eliminate the number of large, mobile vessels from fishing off the Alaska Peninsula when traveling from the Kodiak to the Bering Sea Tanner crab fisheries, or it could attract more vessels by providing an area that yields a relatively high catch, with better weather conditions and shorter distances to the fishing grounds, thereby reducing operating costs.

The Alaska Peninsula area (composed of the current Chignik and South Peninsula districts) Tanner crab resource is relatively small compared to levels of Tanner crab found to the east (Kodiak area) and the west (Bering Sea area). Fishing vessels and floating processing facilities which fish Tanner crab in the Kodiak and Bering Sea districts transit the Alaska Peninsula area. Presently, opportunity exists for this mobile processing and harvesting fleet to fish in the Alaska Peninsula area on the way to more productive fishing grounds in the Bering Sea. This situation presents two major concerns -- conservation and management of the Alaska Peninsula Tanner crab resources, and allocation of this resource amongst competing users.

The most significant conservation purpose served by exclusive registration areas is the reduction of opportunity for pulse type fishing effort which tends to either over exploit discrete stocks or require overly conservative management which prevents full utilization of available segments of the total crab stocks within the registration area. The exclusive registration designation reduces the mobility of fishing vessels, particularly larger vessels which are capable of operating long distances from their home ports. Larger vessels generally have greater fishing power due to their ability to carry more fishing gear and to continue to fish in adverse weather conditions. Therefore, larger vessels will concentrate their opportunities in fishing areas where the greatest opportunity to harvest Tanner crab exist and bypass less productive areas such as the Alaska Peninsula. This reduction in large vessels, with its accompanying harvest capability, will allow for a longer season and reduce the threat of the optimum yield being exceeded. Such a threat existed in 1983 where the harvest capability of the fleet exceeded 9 million pounds, and the optimum yield was 5 million pounds.

The Alaska Peninsula Tanner crab fishery is an existing, historic fishery with established Alaska and non-Alaskan industrial systems (harvesting and

processing) and community infrastructure which depend upon the resources of the area. The designation of exclusive registration assists in preventing economic dislocation of certain segments of the industry which may be affected by a sudden influx of highly efficient and mobile fishing fleets and floating processors. Exclusive registration areas tend to provide a reasonable opportunity for all segments of the fleet to continue to participate in the fisheries. Maintaining a mix of fishing vessels through the fishery encourages the full utilization of the resource throughout its range because some geographic areas requires large vessels to fish large offshore areas while other geographic areas can only be effectively harvested by smaller vessels which have lower operating costs. Failure to institute some form of effort level restriction by area will likely redistribute economic gains and burdens without increases in efficiency. Without exclusive registration areas the mobile fleets have a great potential to change the economic structure or the economic conditions under which the industry operates.

1b. Maintain status quo.

Discussion: No action would allow vessels to fish in the Chignik, South Peninsula, and any other non-exclusive registration area in the FCZ. In 1982 approximately 50% of the Chignik Tanner crab harvest and approximately 30% of the South Peninsula harvest came from the FCZ.

Conduct of the Chignik-South Peninsula Tanner crab fishery must be evaluated in relationship to other Tanner and king crab fisheries. The capitalization levels currently evident in the western Alaska crab fisheries was largely based upon three factors: (1) a large high value crab biomass available for harvest; (2) the ability of new vessels to fish crab in several fishing districts; and (3) the opportunity for vessels to participate in other fisheries (e.g., bottomfishing, tendering, etc.). As more vessels entered the fisheries and as crab stocks have declined, the crab fishery is now characterized by surplus harvesting capacity. Vessels which were constructed to participate in a large boat mobile fleet which fishes numerous areas and species are suddenly handicapped by regulations which severely restrict a mobile crab fleet. Vessel captains must now select a single crab fishery in which to participate rather than fishing in several locations in their attempt

to maximize the vessel's advantage of mobility and fishing power. Additionally, exclusive registration areas tend to concentrate vessel effort into a few crab fisheries with high stock levels because these vessels are "locked into" higher production areas and many lesser production areas have reduced competition.

The major difficulty in adopting this option is enforcement problems which would exist if state and federal regulations were inconsistent. Monitoring this fishery and providing needed protection to the resource would be difficult because federal enforcement of domestic crab fisheries in the FCZ is minimal and the state enforcement effort would be restricted to state waters.

*2a. Change the Southeastern Registration Area (Area A) from non-exclusive to exclusive.

Discussion: At the March 1983 meeting the Board of Fisheries changed the designation of the Southeastern Area from non-exclusive to an exclusive registration area. This action was in response to concerns over the current condition of the Tanner crab stocks in this area and was selected as a method to slow unpredictable amounts of crab gear from entering the fishery. In 1982, there were 85 vessels in the Southeast Tanner crab fishery, an increase of 55 vessels over the previous season. Of the 55 new vessels, 20 large vessels were considered transient and following the closure of this area, they moved elsewhere. With a significant increase in fishing effort and an expected harvest of 750,000 - 2 million pounds, managers were concerned that the optimum yield would be exceeded by such a large fleet. This concern was compounded by the lack of information on harvest rates and vessel location which led to a season closure on the fifteenth day of the fishery. A review of this fishery showed that the final harvest of 1.1 million pounds could have been larger if the season had remained open longer and if the fleet had distributed itself more evenly throughout the area. Changing this area to exclusive registration could discourage transient vessels from participating in this fishery by prohibiting any vessels fishing this area from fishing Tanner crab in any other area. A reduction in fleet size would reduce the intensity of this fishery, thereby allowing for a longer and more orderly season which should result in a greater yield.

2b. Maintain status quo.

Discussion: Currently the Southeastern Registration Area (Area A) is divided into two districts, Yakutat and Southeast. The average harvest from this area has been less than three million pounds. Only a small portion of that harvest (averaging less than 100,000 pounds from the Yakutat district) can be expected from federal waters. There has been no recorded catch of Tanner crab from federal waters in the Southeast district. Therefore, selecting the status quo alternative in the Southeastern area would have little impact on the fishing fleet and the resource.

The original proposal presented to the Alaska Board of Fisheries stated that one of the primary justifications for designating the Southeastern Registration Area (Area A) as exclusive was the concern over the increasing number of large, mobile vessels that fished this area prior to their moving to the westward Tanner crab fisheries. With such an influx of vessels, the season can be shortened considerably (as was the case in 1982-1983) with the local, smaller vessel component of the fleet remaining idle and out of work for longer periods of time. The Board, in review of this situation took two separate actions: the first was the change in registration area designation from non-exclusive to exclusive; the second was to change the Tanner crab season opening date to coincide with the opening of the westward fisheries. Both of these actions, together or separate, will likely reduce the number of mobile vessels from participating in this fishery since those vessels will tend to fish more productive areas. Therefore, maintaining the non-exclusive status would have little impact on either the resource or the local communities as long as the season opens simultaneously with the westward area.

An advantage of this alternative is the promotion of economic efficiency of large, mobile vessels by allowing them to fish in more than one area, if they choose to do so. With the current depressed condition of the Alaska crab fisheries, this may be an important consideration.

2c. Close federal waters in the Southeastern Registration Area (Area A) in part or in its entirety to Tanner crab fishing.

Discussion: With only a small portion of the Tanner crab harvest being taken from federal waters in the Yakutat district, and with the continuing problems maintaining consistency between state and federal fishing regulations in Area A, this alternative may be desirable.

B. Pot Limits

*1a. Lower the pot limit in the Kodiak district from 250 to 200 pots per vessel.

Discussion: Limitations on units of gear per vessel have been applied in some areas as a measure to protect small concentrated crab stocks and as a management tool to attempt to slow the rate of harvest, thereby allowing closer monitoring of the exploitation rate.

In 1980 the State of Alaska implemented a 250 pot limit for the Kodiak Tanner crab fishery. (The North Pacific Council adopted a similar measure in 1982, which remains to be approved by the Secretary of Commerce.) This action was in response to a variety of concerns but primarily was aimed to place a ceiling on the amount of gear used by current participants in the fishery. Recently, with the Kodiak Tanner crab stocks supporting an increasing harvest, the number of new vessels entering this fishery has grown. Since 1980 the fishing fleet has grown from 188 to 360 vessels. With gear saturation at the fishing grounds being an acute problem in the Kodiak district, pot limits restrict the number of pots brought into the fishery by new entrants and stabilizes the amount of gear used by traditional participants. Following the successful 1983 Tanner crab harvest (which exceeded 18.9 million pounds) and with the stocks in a healthy condition, it is likely that the Kodiak fishery will experience continued growth.

The Kodiak fishing community has expressed their desire for a lower pot limit, and in 1983 the State of Alaska lowered the pot limit from 250 to 200 pots. While it is questionable whether a 50 pot reduction will reduce the gear saturation problem, an advantage of this alternative would be the conformity between state and federal fishing regulations.

1b. Maintain status quo.

Discussion: With this alternative, a regulatory inconsistency between the state pot limit (200 pots) and the federal pot limit (250; assuming Amendment #8 is implemented in its entirety) will exist. While the fleet in general, uses fewer than 200 pots (due to individual economics, vessel sizes, desired soak time, etc.), approximately 20% of the fleet do use more than 200 pots. Fishermen who fish with more than 200 pots have chosen to do so because they have determined it is the most efficient use of their time and vessels. Adoption of this alternative would allow this segment of the fleet to continue to fish with up to 250 pots.

**North Pacific
Fishing Vessel
Owners' Association**

July 20, 1983

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

LATE COMMENT

Dear Mr. Branson:

In response to your letter of May 27, 1983, the North Pacific Fishing Vessel Owners' Association (NPFVOA) wishes to comment on proposed Amendment #9 to the "Fishery Management Plan for the Commercial Tanner Crab Fishery off the Coast of Alaska" (FMP). Because this proposal does not differ markedly from the one sent out for public review on December 10, 1982, the Association's December 24, 1982 remarks on the latter version (copy enclosed) should be considered as part of these comments.

GENERAL OBSERVATIONS

NPFVOA is concerned that the proposed framework procedures for establishing seasons may result in a covert abdication by the Council of its management responsibilities for tanner crab in the Fishery Conservation Zone to the Alaska Board of Fisheries. Although the Association supports the concept of a management system which responds quickly to changing conditions in a fishery, such a system must be controlled only by the Council. Rather than elaborate here on this issue, we direct your attention to the "General Observations" section (pages 1 and 2) of our December 24, 1982 letter which explains the bases for our concerns.

SPECIFIC COMMENTS

On the enclosed copy of NPFVOA's December 24, 1982 comments are handwritten notations; these are cross-references to pages and paragraphs in the proposed amendment sent out on May 27, 1983. Because most of the text of the May 1983 proposal is the same as that in the Council's December 1982 proposal, many of the comments made by the Association in December are still pertinent and should be considered by the Council. The following additional comments are keyed to the "Changes to the FMP" section in the Council's May 1983 proposal.

Change #5, (page P-6)

As we understand proposed Amendment #9, the Council could change season opening and closing dates prior to fishing through a Federal Register notice procedure. Should any new information warrant a change in opening or closing dates or harvest levels after these were established by the Council, the Regional Director, Alaska Region, NMFS could take action by exercising "field order authority." If our understanding of the process is correct, we suggest that the paragraph set out in Change #5 follow the material proposed for Change #6; such a sequence would be logical and make it easier for the reader to comprehend the timing of each procedure.

We assume that "newly obtained information" necessitating changes in harvest levels and seasons can be biological, social or economic in nature. The FMP should specify this.

The phrase "to meet the biological, social, and economic criteria of this Plan" should be changed to "to meet the biological, social, and economic objectives of this Plan."

In view of the FMP's objectives (pages 2-1 to 2-2), it seems to be redundant to include the phrase "or to protect Tanner crab resources from biological harm."

We are concerned that there are no specific standards to guide the Regional Director in exercising his field order authority. Without such standards, his actions could be overturned by a legal challenge.

Change #6 (pages P-6 to P-7)

When will the Council review proposed season dates?

How and when are proposals on season dates to be made to the Council?

Will the public have an opportunity to review and comment upon the proposal dates and their rationales before the Council acts? If so, this procedure should be noted in the FMP.

What criteria will the Regional Director use in his initial review of Council approved changes? Are these factors different than those considered in his final determination?

What weight does the Regional Director give to each factor in making a final determination? Are these factors set out in the proposed amendment in their order of priority?

The Association appreciates this opportunity to comment on proposed Amendment #9.

Sincerely,

Richard J. Goldsmith
Executive Director

Enclosure: NPFVOA letter (and attachments) to NP Council, dtd. 12/24/83

cc: Bob Gorrell, NMFS
Lucy Sloan, National Federation of Fishermen

D-4 SUPPLEMENTAL
JULY 1983

D R A F T

REGULATORY ISSUES PAPER FOR AMENDMENT #9 TO THE FISHERY MANAGEMENT PLAN FOR THE COMMERCIAL TANNER CRAB FISHERY OFF THE COAST OF ALASKA

North Pacific Fishery Management Council

July 1983

Prepared by:

North Pacific Fishery Management Council
Post Office Box 103136
Anchorage, Alaska 99510

National Marine Fisheries Service
Alaska Region
Post Office Box 1668
Juneau, Alaska 99802

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I. INTRODUCTION

Executive Order 12291 established guidelines for promulgating new regulations. Under these guidelines each agency, to the extent permitted by law, is expected to comply with the following requirements:

1. Administrative decisions shall be based on adequate information concerning the need for, and consequences of, proposed government action;
2. Regulatory action shall not be undertaken unless the potential benefit to society outweighs the potential cost to society;
3. Regulatory objectives shall be chosen to maximize the net benefits to society;
4. Among alternative approaches to any given regulatory objective, the alternative involving the least net cost to society shall be chosen; and
5. Agencies shall set regulatory priorities with the aim of maximizing the aggregate net benefit to society, taking into account the condition of the particular industries affected by regulations, the condition of the national economy, and other regulatory actions contemplated for the future.

In compliance with Executive Order 12291, the Department of Commerce (DOC) and the National Oceanic and Atmospheric Administration (NOAA) require the preparation of a Regulatory Impact Review (RIR) for all regulatory actions which either implement a new fishery management plan (FMP) or significantly amend an existing FMP, or which may be significant in that they affect important DOC/NOAA policy concerns and involve the public interest.

The RIR is part of the process of developing and reviewing FMPs and is prepared by the Regional Fishery Management Councils, with the assistance of the National Marine Fisheries Service (NMFS) as necessary. The RIR provides a comprehensive review of the incidence and level of impact associated with the proposed or final regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve those problems.

The purpose of this analysis is to ensure that the regulatory agency or Council systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way.

The RIR will also serve as the basis for determining whether or not the proposed regulations implementing the FMP or amendment are major under Executive Order 12291, and whether or not the proposed regulations will have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (P.L. 96-354).

This paper discusses several alternatives which would achieve the Council's objective for Tanner Crab Amendment #9 to varying degrees, and is expected to form the major portion of the RIR which is written after the Council takes final action on this issue.

A. Background

On May 16, 1978, the Assistant Administrator for Fisheries, NOAA (Assistant Administrator) approved the fishery management plan for the Tanner crab fishery off Alaska, in accordance with Section 304 of the Magnuson Fishery Conservation and Management Act (Magnuson Act), P.L. 94-265, 90 Stat. 331, as amended, 16 U.S.C. 1801 et seq. The FMP was prepared by the North Pacific Fishery Management Council (the Council), by authority of Magnuson Act Sections 302 and 303, to manage fishing for Tanner crab by United States and foreign vessels in the Fishery Conservation Zone (FCZ) of the Bering Sea and the Gulf of Alaska (Figure 1).

The FCZ, over which the Magnuson Act extends the exclusive fishery management authority of the United States, includes ocean areas lying between the seaward boundary of the State of Alaska (the "three-mile limit") and a line each point of which lies two hundred miles from the baseline used to measure the territorial sea, except for those areas lying west of the United States-Russia Convention line of 1867. The Assistant Administrator of NOAA, acting with authority delegated by Secretary of Commerce, has primary responsibility under the Magnuson Act for regulating fisheries carried out in the FCZ by all United

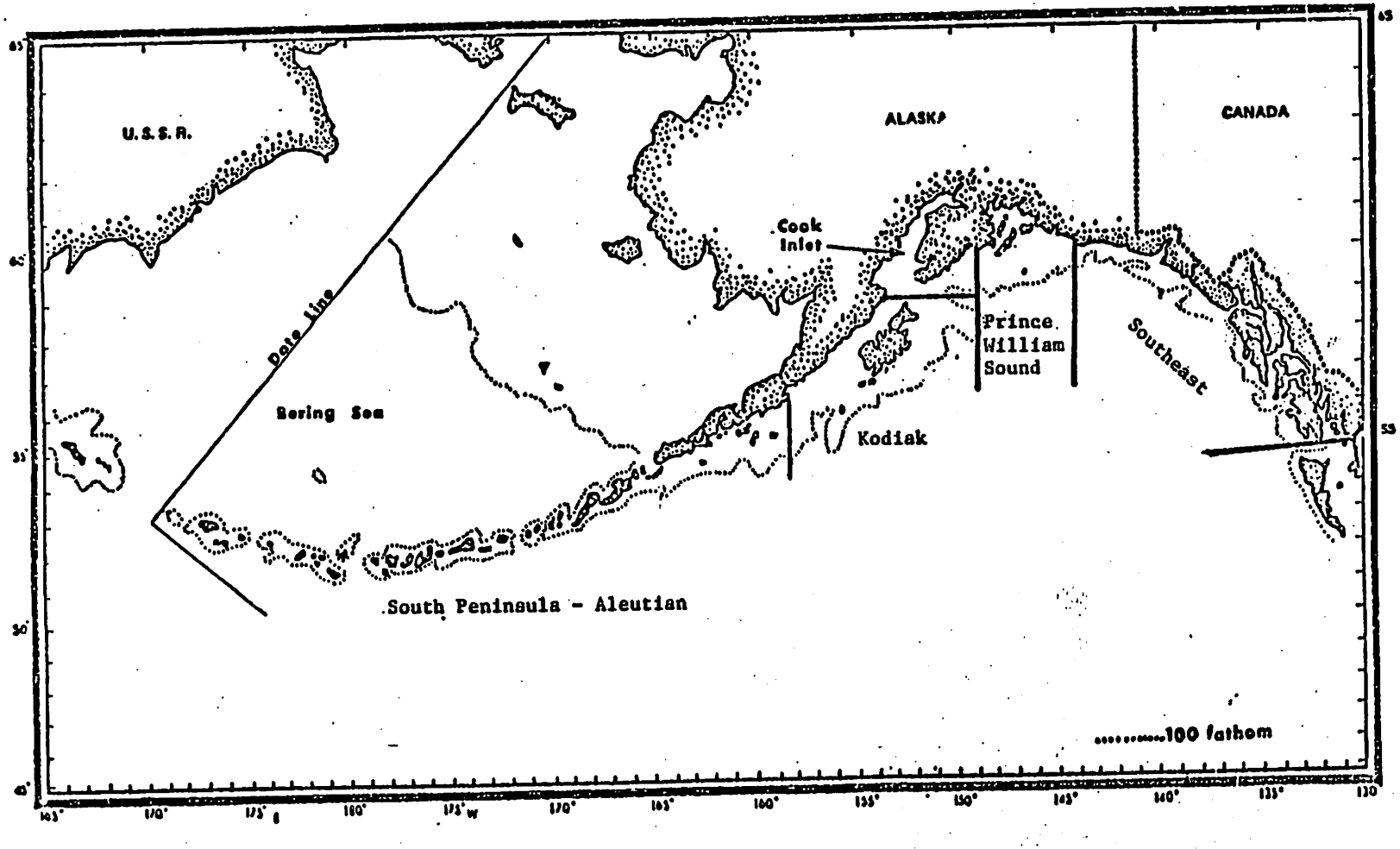

Fig 1. THE SIX TANNER CRAB MANAGEMENT AREAS IN ALASKAN WATERS.

States and foreign vessels. In addition, a state may enforce regulations consistent with those of the Assistant Administrator governing fishing in the FCZ by vessels registered under laws of that state.

B. Amendments to the FMP

The FMP for Tanner crab off Alaska has been amended seven times. An eighth amendment has been approved by the North Pacific Fishery Management Council and is under review by the Secretary of Commerce. These amendments were prepared and eventually approved in response to new biological information, improved management capability and increased expansion of the domestic fleet into the fishery. A review of the amendments and their contents are provided below:

Amendment #1 - Increased the Optimum Yield (OY) for the Kodiak District from 25 million to 35 million pounds (effective March 14, 1979).

Amendment #2 - Extended the area in which foreign crab fishing in the Bering Sea is permitted, by allowing foreign vessels to fish in the area between 54° and 58° N. latitude, west of 173° W. longitude (effective March 14, 1979).

Amendment #3 - Extended the provisions of the FMP through October 31, 1979 (effective January 4, 1979).

Amendment #4 - Extended the provisions of the FMP through October 31, 1980 (effective December 12, 1979).

Amendment #5 - Reduced the OY for C. bairdi in the Bering Sea from 40,381 mt to a range of 10,000-15,000 mt and decreased the estimate of Domestic Annual Harvest (DAH) to 10,000-15,000 mt. Increased the Bering Sea OY for C. opilio from 30,000 mt to 58,984 mt and increased the estimate of DAH to 51,484 mt. Reduced the Total Allowable Level of Foreign Fishing (TALFF) for C. opilio to 7,500 mt. Restricted foreign

fishing to the area north of 58° N. latitude and west of 164° W. longitude (effective November 3, 1980).

Amendment #6 - Modified registration areas, registration requirements, seasons, and gear descriptions (effective November 18, 1981).

Amendment #7 - Established OYs for C. bairdi for the Chignik (2,722 mt), South Peninsula (2,269 mt), and Bering Sea (12,704-16,334 mt) areas. Specified the Bering Sea OY for C. opilio to be equal to the DAH range of 17,954-41,288 mt, reducing TALFF to zero (effective April 8, 1983).

Amendment #8 - Established pot limits for the Kodiak and Prince William Sound areas, while removing pot limits in the Cook Inlet and Southeastern areas. Eliminated the 72-hour, pre-season pot storage provision. Established a minimum biological size limit for C. opilio at 3.1 inches. Prohibited the use of side-loading Tanner crab pots in the Yakutat district, and revised season dates (pending).

II. PROBLEMS NECESSITATING AN AMENDMENT

The Magnuson Act requires that stocks of Tanner crab be managed as a unit throughout their range. The Tanner crab fishery off Alaska extends into the waters of both State and Federal jurisdictions, and the management objectives and measures of both zones should, therefore, be compatible. The intent of the FMP is to manage the Tanner crab resources off Alaska in a manner that is consistent with the State of Alaska's management regime and Magnuson Act National Standards while promoting conservation and allowing full utilization of the resource for food production.

The State, through its Board of Fisheries (the Board) reviews Tanner crab fishing seasons every year. At that time they examine the results of the previous fishing season, receive the latest biological and stock assessment

information, and evaluate regulatory proposals from biologists, resource managers, enforcement agencies, and fishermen. The Board, during its review, discusses the fishery and the regulatory proposals with the Council. The advantage of this arrangement is that both the Board and Council, which utilize much of the same information, can strive toward a uniform management strategy for the Tanner crab fisheries. The problem arises when, following this joint meeting, the State implements new fishing season dates. Though these new State regulations are in effect they differ with the existing Federal season dates until the Federal regulations can be updated. The resulting regulatory inconsistencies are potentially very confusing to all parties (fishermen, processors, and managers alike), can neutralize enforcement efforts, and undermine the jointly determined Board-Council management strategy.

III. OBJECTIVE OF THE AMENDMENT

The specific objective of this amendment is to equip the Fishery Management Plan for Tanner crab with improved mechanisms for setting fishing seasons and the level of Allowable Biological Catch (ABC) for the fishery on an annual basis.

Rationale

This specific objective should be viewed in the context of the Council's longer term goals for management of the Tanner crab fishery, which are to improve the FMP's sensitivity and responsiveness to changes within the fishery, and to remove the causes of the prolonged regulatory inconsistencies between the State of Alaska's management and federal management of Tanner crab which have occurred recently. Ultimately, this reshaping of the FMP will probably involve specifying frameworks for seasonal determination of most or all of the plan's management measures, instead of the current point estimates or ranges of numerical values. Because this would require development of models for prediction of parameters such as stock recruitment, and there are questions about the extent and quality of information about some stocks, this streamlining of the plan will likely require considerable time.

There is an immediate need for amendment of the fishing seasons portion of the plan, however. In the last several years, the Alaska Board of Fisheries has set the season opening dates for the regional Tanner crab fisheries in State waters at its spring meetings. Because these opening dates invariably reflect the use of more current information about the status of stocks than the dates specified in the FMP, they differ. The Regional Director of NMFS has, in the past, been able to avoid the potentially serious consequences of inconsistent season opening dates between State and Federal waters through the use of emergency field orders. The use of emergency field orders for specifying season openings will not, however, be permitted in the future.[1/]

Given the urgency of improving the mechanism for specifying season opening dates, and the dependence of fishing seasons on the Allowable Biological Catch from the fishery, the estimates of ABC must also be modified to reflect stock conditions which have changed substantially since the values in the FMP were selected.

IV. DESCRIPTION AND REGULATORY IMPACTS OF MANAGEMENT ALTERNATIVES

For each of the two management measures of concern in this amendment (season opening dates and levels of ABC), there are four alternatives which can be reasonably contemplated. They are:

1. Develop a framework mechanism for determination of the management measure;
2. Specify a range of specific values for the measure;
3. Specify a new point estimate of the measure; and
4. Leave the current values unchanged (maintenance of the status quo).

1/ The Regional Director is permitted to continue the past practice of closing Tanner crab fisheries in federal waters by emergency order, so season openings present the only immediate problem.

Since some of the arguments in favor of and against each of these alternatives differ with respect to the determination both of ABC and of season opening dates, this analysis will consider each alternative separately within the discussion of each management measure. The starred (*) alternative for each measure appears, from the evidence available, to be the best one to meet the Council's objective for the amendment.

A. Season Opening Dates

*Alternative 1. Develop a framework mechanism for determination of season opening dates.

A framework mechanism typically specifies criteria which will be considered in setting the management measure. It gives latitude to the decision makers (in this case, the Regional Director of NMFS, following recommendations by the Council) in responding to changing resource or market conditions. Accompanying this latitude is a concern that the weighing of biological and market criteria and the determination of the annual season opening date be done responsibly.

In the case of Tanner crab, the risks associated with permitting flexible decision-making are fairly small, for several reasons. First, the necessity for changes in annual season opening dates arises primarily from the need to implement jointly agreed upon Board of Fisheries-Council management strategy. The management system for Tanner crab is quite responsive to changing industry or resource conditions, largely because of the annual meetings at which the Board and Council together hear current information on the condition of stocks and consider proposals for regulatory changes which originate with the public or management agencies. The history of federal Tanner crab management since passage of the MFCMA reflects a desire by the Council to manage the fishery in cooperation with the state (so long as the Magnuson Act standards are met), and a frustration at the ability of the federal regulatory structure to respond to dynamic resource conditions in Tanner crab.

The primary goal of flexible setting of season opening dates has, therefore, been to implement jointly agreed upon management strategy in concert with the

state. The Regional Director's use of emergency field order authority in the past to surmount the regulatory delays reflects that goal.

A second reason why the risks of permitting a framework mechanism for Tanner crab are small in that Tanner crab seasons have been fairly tightly bounded on both ends by biological and market factors. The specific factors which have influenced the setting of seasons in each region of the state vary from region to region, but typically the Tanner crab season is preceded by the king crab season and followed in fairly short succession by the beginning of the reproductive period.

The impacts of changing the season opening date appear to have a greater effect on the distribution of earnings from the fishery rather than their magnitude. Unlike the king crab fishery, recovery rate does not appear to play an important role in the determination of fishing seasons, nor does it appear to vary systematically through the course of the season like recovery rates for king crab do. This is due in large part to the product forms into which Tanner crab is processed at the time of primary processing. Currently, almost all Tanner crab is processed into leg sections, shell and meat together, as compared to the king crab products, which are predominantly just meat. As a result, recovery rates for Tanner crab appear to range from 55%-65%, while king crab recovery rates (meat only) generally fall between 15% and 22%.

The recovery rate measure used for Tanner crab is somewhat specious, since an increase in recovery rate of leg sections does not necessarily translate directly to an increase in meat yield. What processors look for more is "fullness," or how much flesh is in the shell. After molting, the crab's legs are filled with a substantial amount of fluid, which gradually is converted to flesh as it grows. Thus, while recovery rate may not change much over the course of a season, meat content does. The optimum time to harvest any individual crab is just before the formation of the double skin, which signals the beginning of the molt; at this point the crab needs to molt in order for further growth. Beyond this point, a greater proportion of the crab's energy is devoted to formation of the double skin, and it is increasingly susceptible to handling mortality and deadloss.

Since there is some variation in the timing of the molt for individuals in a population, the optimum meat yield from commercial catches probably occurs at a point where increased fullness of crab which are still growing balances out the loss from increased numbers which have begun to molt.

While the general principles just mentioned would seem to suggest that increasing economic returns (up to a point) could be achieved by delays of season opening dates, Tanner crab seasons in all areas currently take place during the latter part of the period of biological availability, and could probably not be postponed much without jeopardizing the ability of fleets to take the whole ABC. Movements of season openings would likely not have much influence on season average recovery rates, anyway, so it is doubtful that increasing economic returns to either fishermen or processors provide much motivation for (or are affected much by) changing season opening dates. Certainly if later season opening dates caused any loss in earnings because of an inability to take the entire ABC, this would not seem to be compensated for by an increase in recovery rates.

Scheduling of other fisheries influences the scheduling of Tanner crab fisheries as well. From Southeast Alaska to Kodiak, spring fisheries for herring or salmon attract both fishing and processing capacity away from crab. Similarly, the king crab season, which begins in the fall, provides a higher valued alternative for both fishermen and processors. In the major Tanner crab producing areas (Kodiak and the Bering Sea), Tanner crab fisheries developed as a means of lengthening the employment of both harvesting and processing capacity. In this context exploiting a less valuable resource was profitable, but Tanner crab fisheries were always secondary to king crab, and seasons were set to complement, not compete with, the production of king crab. Even today, though king crab fishing has declined markedly, Tanner crab is viewed as a followup to king crab fishing.

In smaller areas, other market-related considerations prevail. In the South Peninsula area, for example, Tanner crab opening dates have in recent years been moved back in time to coincide with dates in the Bering Sea, in a move to protect the local fleet's market share against "grazing" by larger vessels en route to the Bering Sea. In this area, price is typically negotiated based on

what the Bering Sea price is, plus some small factor (2-6¢/lb.) to reflect differences in transportation costs and other considerations. With earlier seasons, the South Peninsula fishermen were well into their fishery before they found out what they were being paid. In recent years the shrinking supply of Tanner crab from Alaska, when matched with undiminished demand, has tended to cause ex-vessel prices to rise from the opening date on. South Peninsula fishermen found that settling at the opening Bering Sea price plus a small fudge factor was costing them money; the local sentiment was that better control over price negotiation could be maintained with concurrent seasons.

Alternative 2. Specify a range of specific values for season opening dates.

The advantage of the framework method for setting seasons becomes more apparent upon seeing the weaknesses of the alternatives, especially in light of the fact that Tanner crab seasons are rather narrowly defined anyway, and the risks of permitting movement of season opening dates within that narrow window are small.

Fishing seasons are highly dependent upon the amount of the resource which is available for harvest. Current biological evidence argues for fairly broad ranges of ABC, given the uncertainty about its true value in view of the relative lack of knowledge of Tanner crab biology. Harvest guidelines based on these broad ranges, in combination with fluctuations in environmental factors such as water temperatures, suggest (as in the history of Tanner crab so far) that there is a fairly broad range of season opening dates which would be entirely reasonable when based on the current information that the Board and Council receive annually. While it would in theory be possible to specify a beginning date and end date to encompass all forseeable eventualities in the near term (say, September 1 to March 31, or perhaps the entire 8-9 month period when it is biologically safe to harvest Tanner crab), this would lose any meaning or usefulness to fishermen and processors in planning their production schedules. On the other hand, too narrow a choice of specific dates could easily move the Council in a situation as unworkable as the current one, where the FMP amendment process is absolutely unable to cope with management or regulation changes which need to be made on short notice (say, within a year's time).

An excellent illustration of why specifying season dates can become quickly inadequate is found in the dramatic changes in both the king and Tanner resources which recent history has seen. The early development of the Tanner crab fishery took place when the king crab fishery was nearly fully developed, particularly in the Bering Sea and Kodiak areas. Seasons for Tanner crab were set to begin after the king crab season, largely at the request of processors who found it inefficient to handle production of king and Tanner crab simultaneously. Barely six or seven years later, king crab harvests have dwindled to a fraction of what they were, and king crab seasons are much shorter than they were. The current opening dates for Tanner crab, which were established six years ago, create inefficiencies in both harvesting and processing. Vessels which fish for crab, and processors who process it, find it very expensive to maintain crews on the grounds during the idle period between king and Tanner seasons, or to fly crews in and out as they're needed. As a result, informed sources expect that there will be efforts made by both processors and fishermen to move up opening dates for Tanner crab to make the two seasons consecutive once again.

Given the history of other fisheries (sockeye salmon, for example), it is entirely likely that conservation measures currently employed will be successful, and that large harvests of king crab may once again require a postponement of season opening dates. These shifts are extraordinarily difficult to anticipate in the setting of ranges of opening dates that are narrow enough to be meaningful to fishermen. The framework procedure, in contrast to setting a range of specific season dates, offers the flexibility to respond quickly to changing conditions, yet through a notice procedure inform fishermen and processors of the annual determination of season opening date.

Alternatives 3 and 4. Specify a new, single, season opening date, or leave the current value unchanged.

Both of these alternatives are untenable in the context of the current problem faced by the Council. They both suffer from the obvious defect that they require emergency field order action to be modified, action which is no longer permitted. Given the dynamic nature of biological and market conditions in

the Tanner crab fisheries and uncertainties in our knowledge about them, point estimates of management measures which become binding must be viewed with a great deal of skepticism.

B. Updating MSY and ABC Values

Alternative 1. Establish a framework mechanism for determination of MSY and ABC.

The primary purpose of Amendment #9 is to institute a more flexible method of establishing fishing seasons and to clarify procedures used when making in-season adjustments. Because of the close interrelationship between setting a fishing season and the attainment of the ABC, the Council chose this amendment as the appropriate vehicle for updating MSY and ABC (and, implicitly, OY) values currently in the FMP. Most of the values in the plan are no longer applicable due to biological changes in Tanner crab stocks and some values have not been revised since implementation of the FMP in 1978. Fishermen and resource managers, who look for guidance to the published MSY and OY values in the federal regulations or the FMP, would be making decisions based on old information. (This is even more likely now that the State of Alaska has stopped publishing a harvest forecast in its Tanner crab regulations.) Additionally, if sound biological management dictated that a fishery should be closed at the current best estimate of ABC or OY, but that value conflicted with outdated published values, it would give the misleading impression that market factors or harvest capacity were binding.

In past years, the plan amendment process has been used to implement new ABC and OY values. This is a very lengthy and time-consuming process, with values often becoming out of date by the time the amendment is approved. (The recent amendments to the MFCMA could, however, accelerate the review and implementation process.) This process is required when OY estimates are numerically specified in the FMP. The Council's longer range solution to this problem is to develop a framework procedure in the FMP for setting annual ABC and OY estimates. Under such a framework, the National Marine Fisheries Service would announce, prior to the beginning of season, a harvest forecast or OY based on the most recent survey information available. This type of procedure

would eliminate the need to specify numerical ABC and OY values in the FMP, so that updating these values would not require a plan amendment. However, developing such a framework procedure will take considerable time, since it is necessary to specify how ABC and OY will be calculated from pertinent biological information. This would require, at a minimum, the development of a stock-recruitment model, since none currently exist which are suitable for the prediction of ABC. Thus, while developing a framework for ABC and OY is compatible with the Council's long-term goals, it is inconsistent with the objective of this amendment, which is to improve the FMP's estimates of ABC and OY in a way that will reflect current information without hindering the deployment of a framework mechanism for setting fishing seasons.

*Alternative 2. Update the range of ABC and OY estimates.

This is the most flexible and will require the least subsequent amendment of the remaining alternatives, given that a framework is beyond the scope of this amendment.

The estimates provided in Table 1 show the ABC as currently stated in the FMP, the proposed ABC estimates expressed in a range as presented in Amendment #9, and the projected 1983 Tanner crab harvest, based on stock assessment surveys and past fishery performance. It is clear that the proposed ABCs are not radically different from those currently in the FMP and that the projected harvest in each area for the near term will fall within the proposed range. The OY is currently defined in the FMP as equal to ABC in all areas except the Bering Sea, where C. opilio OY is equal to domestic annual harvest (DAH). Presenting ABC as a numerical range, as opposed to a point estimate, will provide some flexibility in the OY without requiring an annual plan amendment. For example, during the 1981/82 season, the Kodiak district produced less than 14 million pounds of Tanner crab. This harvest was at least 6 million pounds below the OY of 20-35 million pounds specified in the FMP. This apparent failure to attain the OY was not due to poor management of the fishery, the fleet's technical inability to harvest additional crab, or market constraints, but instead resulted from a declining population level of the Kodiak Tanner crab stocks.

Using the proposed ABC range of 11-33 million pounds would have led to the correct conclusion that a 14 million pound harvest in 1981/82 achieved the desired OY level based on current stock conditions. A plan amendment would only be necessary if survey information indicated that a future harvest would fall either above or below the ABC/OY range. In addition to the likelihood of attaining an OY specified in the FMP, the new ABC estimate also provides clearer guidance to both resource managers and the fishing industry on what harvest to expect in a given area. Currently, ABC and OY values have not been useful because they have generally been unrealistically high and therefore of no use in fisheries management or in pre-season planning by fishermen. Tanner crab fisheries have been closed in the past more often for reaching a scheduled closure date, or by field order based on declining catch per unit of effort, than for attainment of the fishery's specified OY. The proposed Tanner crab ABC/OY estimates, while presented as a range, are set as narrowly as possible and as such they will become a more useful management and planning tool for fishermen and processors.

It was just noted that OY is defined in the FMP as equal to ABC in all areas, except for C. opilio Tanner crab in the Bering Sea, where OY is set equal to the DAH, not to exceed ABC. This definition is necessary because of the current lack of stock condition and survey information and the difficulty in determining an ABC estimate with a high degree of confidence. Even in the Bering Sea districts, where annual Tanner crab surveys have been conducted as early as 1973, the data base is still weak and until it is strengthened, fishery managers are reluctant to deviate from the ABC estimate in determining OY.

This approach embodies the assumption that market factors are not the constraints to increased production of Tanner crab, it is the biological limits of the resource. In view of the unabated consumer demand for crab, diminshed harvests of both king and Tanner crab, and excess capacity in the crab fleet, this is entirely realistic. The ranges presented for OY are, therefore, reflections of biological uncertainty about what ABC should be, given the lack of research on the subject. Fleet harvests are monitored carefully during the Tanner crab season, and catch per unit effort changes are used as a key in-season management indicator of abundance. If catches are within current

Table 1. A comparison of the current ABC values, proposed ABC values and recent/projected Tanner crab harvests for each management area.[3/]

Area	Current ABC[1/]	Proposed ABC[1/]	1983 Projected Harvest[1/]
Southeastern (Area A)			
Southeast Dist.	2.5	1.0-3.0	2.0
Yakutat Dist.	3.0	0.1-1.0	0.1
Prince Wm. Sound (Area E)	3.0-7.0	1.5-3.5	2.0
Cook Inlet (Area H)	5.3	1.5-3.0	2.0
Westward (Area J)			
Kodiak Dist.	20.0-35.0	11.0-33.0	20.0
Chignik Dist.	5.0	2.0-5.0	3.6
S. Penn. Dist.	6.0	3.0-6.0	3.0
E. Aleut. Dist.	2.0	0.1-2.4	0.5
W. Aleut. Dist		0.1-2.0	0.5
Bering Sea (C. bairdi)	28-36	5.2-28.5	5.2
(C. opilio)	68-112	20[2/]-130.0	20[2/]

1/ In millions of pounds.

2/ This estimate is subject to change as the season is still in progress.

3/ OY is defined as equal to ABC in all areas except in the Bering Sea where an exploitation rate is applied to the ABC.

ABC estimates and catch rates decline, the fishery can be closed on biological grounds, and by definition, harvest equals ABC equals OY.

In light of these factors, the decision to update ABC estimates to more realistically reflect current stock conditions does not really have any economic content, even though the OY range, of necessity, changes too. It simply utilized better estimates of the biological realities, and may avoid some confusion in planning.

This is not to say that the levels of earnings in the industry will not or have not changed. They most certainly will, and have, since the supply of Tanner crab has been reduced, and prices will likely respond. But the important point is that these economic effects have occurred as the result of biological changes in the stocks, and not as a result of implementation of this amendment, which simply reflects that changed biological reality.

Nonetheless, it is informative to examine the likely effects on ex-vessel gross earnings of the extreme choices the Regional Director has in setting the ABC (and OY). The most dramatic price effects will occur if ABC is simultaneously set at the low end of the range for every area, compared with ABCs set simultaneously at the high end of each range. In aggregate, the supply of Alaska Tanner crab could vary from 45.7 million to 217.4 million lbs., compared with the projected 1983 harvest of 58.9 million lbs.

To estimate the likely impacts of these changes in aggregate supply on gross earnings, a model of Tanner crab price determination developed by Dr. Joe Terry of the NWAFC was consulted. This model predicts the statewide Tanner crab price (a weighted average, for opilio and bairdi combined) as a function of current Tanner crab landings, the U.S. consumer price index, last year's king crab price, and the proportion of Alaska landings which were bairdi. The model, which has a nice statistical fit, predicts a price of $2.14 in 1983 dollars at an aggregate catch of 45.7 million lbs., and a price of $1.47 for an aggregate catch of 217.4 million lbs.

The model predicts 1982 prices very well ($1.12 predicted vs. $1.19 actual), but does not do so well for 1983. The predicted 1983 price for the projected

1983 landings of 58.9 million lbs. was also $2.14, which is substantially higher than the expected actual 1983 average price of $1.20-$1.30. This is probably due to a large increase (for the first time) in Canadian supply of Tanner crab in 1983, which may have depressed the Alaska price more than would be expected given the level of Alaska landings (Terry, personal communication).

Bearing this in mind, the models predictions for 1983 price were adjusted proportionally downward so that the model's predicted 1983 price was $1.25, more in line with the expected actual 1983 price. This caused the adjusted predicted price for catch of 217.4 million lbs. to be $0.86, for a total estimated ex-vessel gross earnings of $186.96 million. At a catch of 45.7 million lbs., the adjusted predicted ex-vessel price was $1.25, for a total estimated ex-vessel gross earnings of $57.13 million. Estimated actual 1983 ex-vessel gross earnings were $73.63 million.

Alternative 3. Specify new point estimates of MSY and ABC.

This would be an improvement over the status quo, but doesn't realistically reflect the uncertainty which exists about the status of stocks or the way the fishery is actually managed. If a point estimate were specified for ABC and OY in the FMP, and actual harvest were to differ from that value, incorrect implications about the fishery would be drawn. If, for example, the actual harvest this year were lower than the FMP-specified point estimate of ABC and OY, the implication would be that market or other non-biological constraints impeded the achievement of ABC; also, the fact that OY exceeded the actual harvest suggests that OY is not, in fact, optimum, i.e., it was incorrectly estimated. This is obviously a misleading implication of the point estimate specification of OY. Further, several Tanner crab fisheries already have ABC specified as a range, and updating these estimates with single values would clearly be a step away from, not towards, less cumbersome management.

Alternative 4. Leave the current values unchanged (maintain status quo).

While it doesn't meet the Council's stated objective, this certainly is a course of action which could be taken. The reasons against it, however, are

persuasive: why not make use of more current biological information; why not eliminate the misleading and confusing implications which out of date information tends to spread?

V. OTHER PROPOSED CHANGES TO THE FMP

Two other changes to the FMP are proposed. One establishes a pre-season notice procedure for adjusting season opening dates. The second change is a clarification of the Regional Director's field order authority, empowering him to make whatever in-season modifications to season opening and closing dates new information may require.

Since both of these changes are only technical in nature, empowering the Regional Director to carry out the fishing seasons and ABC provisions of the amendment, they do not require separate consideration.