



Mr. Chairman, Members of the Committee, I am Don Bevan, Professor of Fisheries and Marine Studies of the University of Washington and Chairman, Scientific and Statistical Committee, Pacific Fishery Management Council. It is a pleasure to be invited to testify before you today. I am honored to be counted as a member of the group you have called upon. They have played important roles, not only in the management of Northwest fisheries, but have contributed internationally to the discipline of fishery science.

I should like to share with you today my opinions of the fundamentals of salmon management. My views have been molded by over thirty years of teaching, research and participation in salmon management. Fishery management has several goals and as with any endeavor, sometimes, our goals conflict and when that happens, we must set priorities.

Clearly the first priority in fishery management should be to provide sufficient reproduction to perpetuate the population. In many fisheries, unfortunately not salmon this goal of perpetuating the population is easily met. Since fishermen fish for dollars they can often run out of dollars before they run out of fish and the resource is protected. I shall explain later why that situation rarely applies to salmon.

A more difficult goal then, is to maintain the resource at levels which will provide an economic return. This means, that in many cases, we regulate people rather than fish. I, and most fishery biologists, make no apology for this. People are more important than fish.

Another major goal of management is to provide orderly fishing. We do this by separating in time or space competing forms of fishing gear. Gillnets, for example, may fish at night and purse seiners in the daytime. Fixed gear, such as long lines can be given sanctuaries, where trawling with mobile gear is not allowed.

A goal often obtained in management is to achieve biological efficiency in the catch. We attempt to catch sizes and ages where growth and mortality provide the best balance. Size limits, and fishing seasons for fast-growing species, are among the methods used.

Less often do we attempt to provide economic efficiency. Sometimes we can set size limits which maximize return by meeting a particular market demand, or seasons can be set to favor fishing when the quality of roe meets the requirements of the market. Our major problem in dealing with economic efficiency is the common property nature of the resource. We all own the fisheries though individually we treat them as though no one owned them. Fish are not property in ownership of anyone until they are landed. A wheat farmer who owns a ranch will use only as many combines as needed to harvest his crop. To do otherwise would decrease his profit, or increase his loss, depending upon the year in question. If the first man in the field could claim the harvest we would see many more combines than necessary to provide the best return. Much of the difficulty then, in fishery management, results from the fact that the fishermen have no property rights and they pay no rent for the use of the resource.

I think I can best explain the difficulties by using an analogy I've used many times before concerning the forest industry. Consider for a moment what would happen if we were to regulate our forest renewable resources in the way we regulate a fishery. If, for example, logging were conducted under regulations similar to fishing, the regulatory agency would publish a series of regulations every year similar to the following:

1. Logging will begin at 6:00 a.m. June 15 and close October 1 at 6:00 p.m. in the even-numbered townships and sections.
2. Logging will be permitted on Tuesdays and Fridays, subject to extension or restriction by field announcement.
3. A logging license to cost \$25.00 must be purchased prior to April 1.

4. It shall be unlawful for any person, firm, or corporation to use, employ, or operate a power-driven saw for the purpose of removing timber.
5. Hand axes must have a blade less than 4 inches but more than 3 inches with a handle to exceed 18 inches. No logger shall have in his possession more than one axe.
6. Each axe shall be legibly marked with the registration number and initials of the operator. No axe shall be placed or operated less than 600 feet from any other axe.
7. No logging truck shall be longer than 30 feet overall, except trucks that logged prior to January 1, 1960.
8. Trees with cones can be taken only prior to July 31.
9. Western red cedar (Thuja plicata) is a protected species.

If a cedar tree is knocked over during logging operations, it must be propped up and left in the woods.

These regulations would make nonsense in the timber industry, but similar regulations are a way of life with the fishing industry. They would also make nonsense in the fishing industry if we could find some way to protect the runs other than by decreasing the efficiency of fishing gear. The root of the problem is that an individual fisherman has no incentive to maximize the yield from given stocks of fish. If he does not catch them, someone else does, so he cannot save them for the future.

Another goal of management is to allocate among different fishery gears. The usual tools are to restrict the time and space in which fishermen can operate, or restrict their efficiency when they do operate. Because the fishery manager can often not operate directly by restricting fishing effort, he becomes an inefficiency expert so that he may limit fishing effort indirectly.

If more than one kind of fishing gear is used, it is almost impossible to ignore the question of allocation, because regulations may affect the various gear in different

ways. If a particular regulation bears more heavily on one form of gear than another allocation is the result, whether it is defined explicitly or implicitly. The timing of fishing may also affect allocation. For example, The Pacific Fishery Management Council manages only outside of the three mile territorial sea and its regulations affect only ocean fishermen. Its regulations that are aimed at providing adequate spawning must consider the amount of fish to be taken inside of three miles by trolling by nets, and by sports fishermen if the escapement from the ocean is to provide an adequate number of spawners in the river.

Salmon and steelhead management have some inherent problems that make the task of management more difficult than other species.

First, salmon rarely provide more than two and often only one year class in the fishery. This means that reproduction in a year is not spread out over several age groups. Fishing that is too heavy in a season cannot be corrected as easily as in a multi-aged fishery on species such as bottom fish. On the other hand, under-fishing is an opportunity that is lost forever.

Second, the time and place of migration is definite and predictable. Fishing gear can be placed so that it is possible to take very high percentages of the run. Percentages that if unregulated could lead to decimation.

Third, the salmon is very valuable. The success of regulation is dependent upon the cooperation of the fishermen. The incentive for illegal fishing is now higher than it once was because the penalties are based upon deflated values and the potential gain is large. Not long ago, a single 20 pound Spring chinook sold in a Portland retail store for \$120.

Fourth. Salmon are more variable in the success and failure of a year class than most ocean species. This means that forecasting run size is more difficult and at the same time, more necessary. We use a number of various methods to forecast the abundance of

Pacific salmon. In general I would rate our ability to forecast coho, sockeye and pink salmon as good. We can forecast the abundance of four year old Fall chinook with some success, but I must rate as unsatisfactory our forecast methods for Spring chinook, three-year old Fall chinook and chum salmon. Nor does the early ocean harvest provide much clue as to the size of the run to be expected inshore or on the spawning grounds. In most fisheries we can measure the catch per unit of fishing effort and apply to this an appropriate catchability coefficient to determine the abundance of the stock. Unfortunately, the catchability coefficient varies so much in the ocean salmon fishing that the rate of catch per unit effort is a poor measure of total stock size.

With salmon we can set suitable regulations only if we can forecast the size of the run. If we cannot forecast, or if our forecast is in error, we must have a system that can be easily adjusted to meet the demands of change in estimates of run size. This variability that we see in run size should not surprise us if we consider the life history of salmon. A pair of spawners produce several thousand eggs which, to perpetuate the run need to provide only two spawners, plus the four to eight usually taken in the catch. Therefore, any small variation in any of the natural mortalities that drop the abundance from several thousand to somewhere near ten provide an opportunity for great variation in the final return.

Fifth, man can have an impact upon the spawning grounds or on the migration of salmon upstream for spawning, or downstream to the ocean. Man's impact has been particularly severe on Spring chinook which migrate long distances in the large rivers, the same rivers which also provide most of our hydroelectric energy. Also impacted have been the wild coho stocks which spawn in small tributaries which feel the brunt of road construction and suburban residential and commercial development.

Let me turn now from facts and theory of management to look at the future of our salmon runs. The question asked most often, "Is it possible to have larger runs in the future and what is required to do so?" My answer to the first part of the question is

Yes, we can provide more salmon if we can do two things. First, we must more effectively protect our natural spawning grounds, at least the most valuable ones and at the same time provide enhanced capability of artificial rearing, together with increased attention to the evaluation of the success of our enhancement. While I do expect breakthroughs in research on disease control and nutrition, I believe the greatest contribution of research to be in the evaluation of production methods.

Second, we must create a unified management system. It is my view that it must be a regional system, with strong local participation. I can best summarize the need for unified management by quoting from an amicus brief to the United States Supreme Court prepared by the American Institute of Fishery Research Biologists. They said: "The current management system for salmon and steelhead resources is inadequate. In part, as a result of Court decisions management authority is spread among too many entities and as a result, the system is incapable of insuring the preservation of the resources, optimizing of yields, or allocation of catches among users groups." I concur with these conclusions of the American Institute of Fishery Research Biologists and the following principles for Congressional guidance which they offered:

1. The management system should have the capability to rapidly collect and analyze statistical information including catch and effort data from all fishermen exploiting the resource.
2. The management system should be capable of making coordinated decisions for regulating the activities of all fishermen and should have the authority to conserve the resources, maximize the yield, and allocate the permissible catch among user groups in a fair and equitable manner according to law.
3. The management system should be able to make rapid and timely adjustments to regulations while each run and each fishery are actually in progress.
4. The management system should have the ability to enforce decisions and regulations with regard to all fishermen.

I should like to thank you for the opportunity of testifying today. If there are any questions I will be happy to try to answer them.

# North Pacific Fishery Management Council

Clement V. Tillion, Chairman  
Jim H. Branson, Executive Director

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AGENDA ITEM #14  
May 24-25, 1979

## MEMORANDUM

DATE: May 21, 1979

TO: Council Members, Scientific & Statistical Committee and  
Advisory Panel

FROM: Jim H. Branson, Executive Director

SUBJECT: Bering Sea/Aleutian Island Groundfish FMP, Decision Paper

At the March 22nd-23rd Council meeting the Council reserved the longline sanctuary section in the approved FMP for the Bering Sea/Aleutian Island Groundfish Fishery, in order to allow the representatives of the longline and trawl fisheries of Japan additional time to submit alternatives. This action also postponed the Council decision on other time/area closures in the Aleutian Island area.

The final plan is now being reviewed by the Secretary of Commerce. The Secretary cannot proceed with the review of the plan without a Council decision on the reserved sections of the FMP.

Council consideration is required of the following:

- Option 1 - PMP time/area closures I
- Option 2 - PDT Proposal (July 1978) II
- Option 3a - PDT Proposal (March 28, 1979)
- Option 3b - Japanese trawlers' proposal (April 10, 1979)

## Summary of Development of the Proposals

### Option 1

This series of time/area closures within the 3 - 12 miles off the Aleutians was incorporated into the draft FMP from the PMP, (originally developed as a result of bilateral negotiations). See Chartlet 1.

### Option 2

The proposed traditional closures prompted several public comments. As a result of further investigation of the issue by the PDT, and a request by the Japanese Longliners Association, Option 2 was developed and



presented at the July Council meeting, (see Chartlet 2). Option 2 incorporates a longline sanctuary area into the traditional time/area closures.

The points of difference between 1 and 2 are:

North of the Aleutians:

a) within the 3-12 mile zone, in the area 172° W to 176° W, longlining season has been changed from April 1 to November 1 and is allowed year round, outside the halibut season.

b) trawling time/area closures remain unchanged.

South of the Aleutians:

a) within the 3-12 mile zone, the longlining only area has been extended from 172°W to 179°E and is allowed year round outside of the halibut season.

b) the trawling area is reduced by 5 degrees of longitude.

### Option 3

After a lengthy public comment period which ended January 10, 1979, the Council decided to extend the comment period to the February meeting. At the March meeting the Council again decided to further extend the comment period on this issue to the May meeting in order to allow the Japanese trawlers and longliners an opportunity to submit a joint position. The second PDT proposal for the longline sanctuary was forwarded to the Council on March 28th, 1979 (Option 3a, Chartlet 3). The points of difference between 3 and 1 and 2 are:

North of the Aleutians:

a) within the 3 to 12 miles zone, in the area 172° to 179° E, longlining is permitted all year.

b) trawling area is reduced by 5 degrees. However, the season is extended to allow trawl fishing all year.

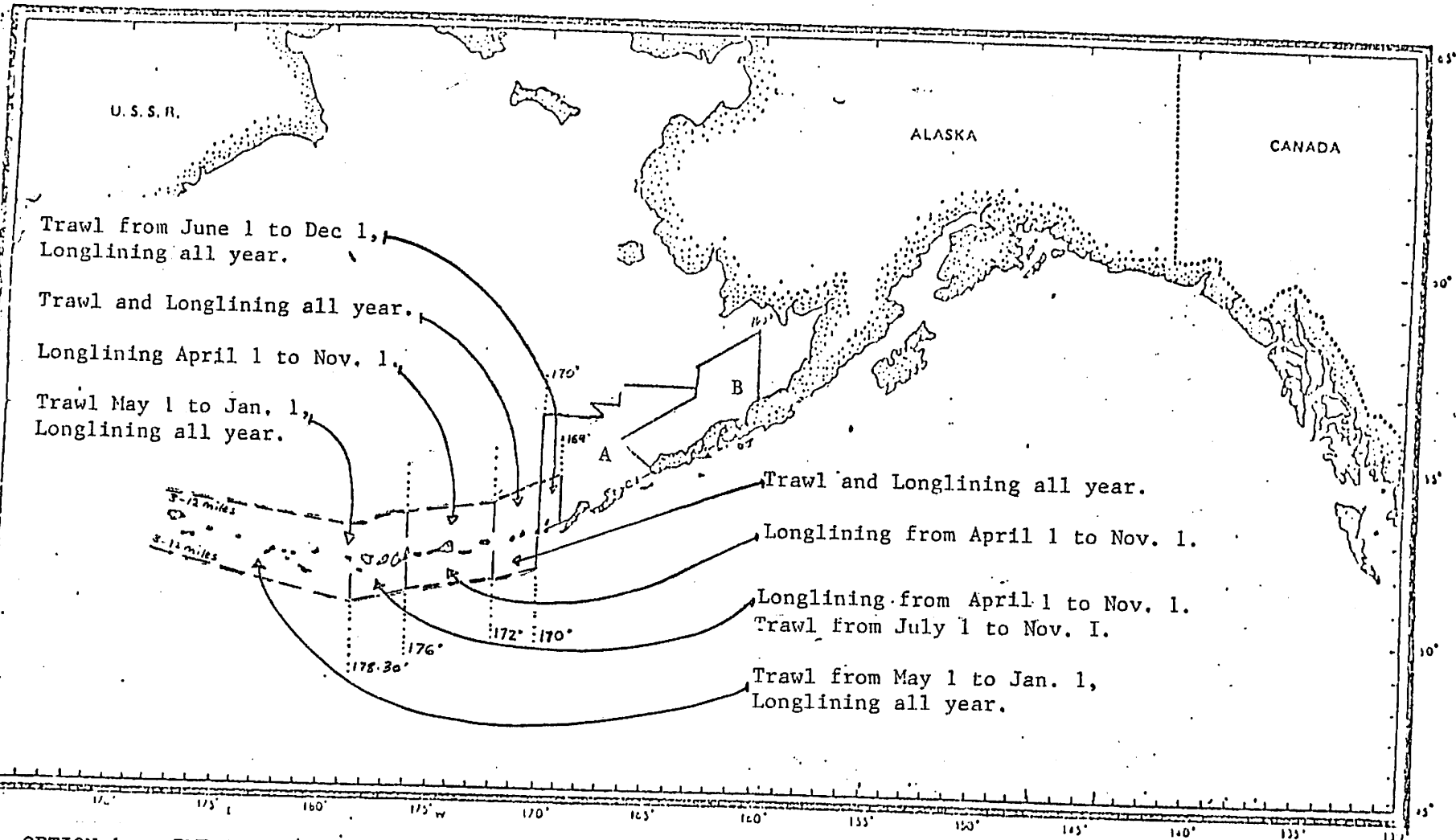
South of the Aleutians:

a) In the area 172° W to 179° E, from 3 miles out to 200 miles longlining only is allowed all year.

b) within the rest of the 3 - 12 mile area trawling and longlining are allowed all year, although the trawling area is reduced.

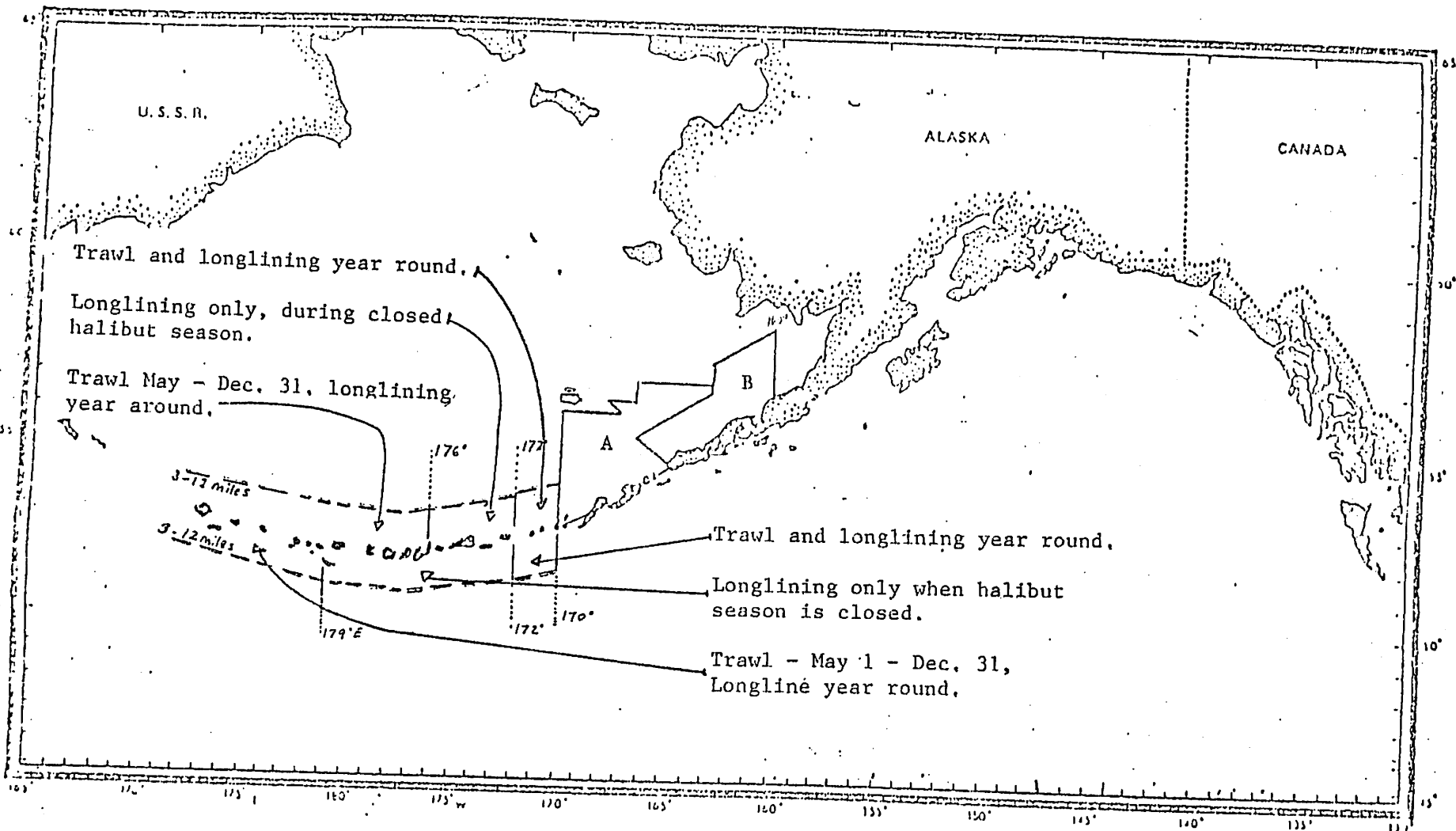
This proposal thus removes unnecessary time/area restrictions, simplifies the regulations and provides for a longline sanctuary. Open areas for trawling have been reduced, but the season for trawling has been extended to the whole year. It is supported by the North Pacific Longline Gillnet Association. Additional information on this proposal is in the correspondence from the PDT to the Council. (Agenda Item #14)

The Japanese trawler's position on the longline sanctuary was forwarded to the Council on April 10th [Option 3b Chartlet 4]. This differs from Option 3a in the longitudinal boundary of the sanctuary (Chartlet 4). They propose the same eastern boundary of  $172^{\circ}$  W but a western boundary of  $178.30^{\circ}$  W. They also propose a restriction in the 3 to 12 mile area west of  $178.30^{\circ}$  W whereby trawling would only take place between April 1st and December 1st, both north and south of the chain.

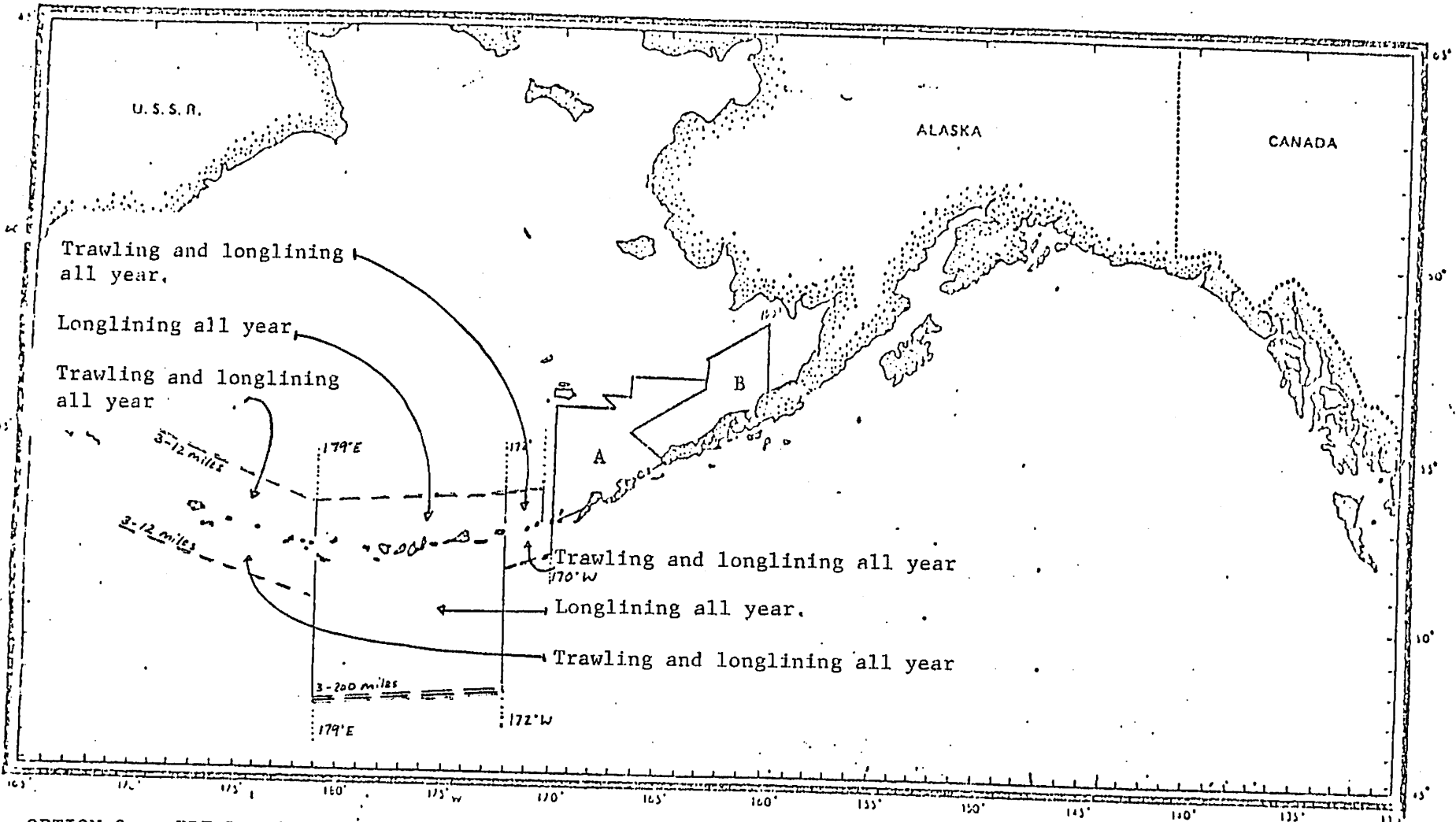


OPTION 1: PMP TIME / AREA CLOSURES.

- (A - Winter Halibut Savings Area)
- (B - Bristol Bay Pot Sanctuary)

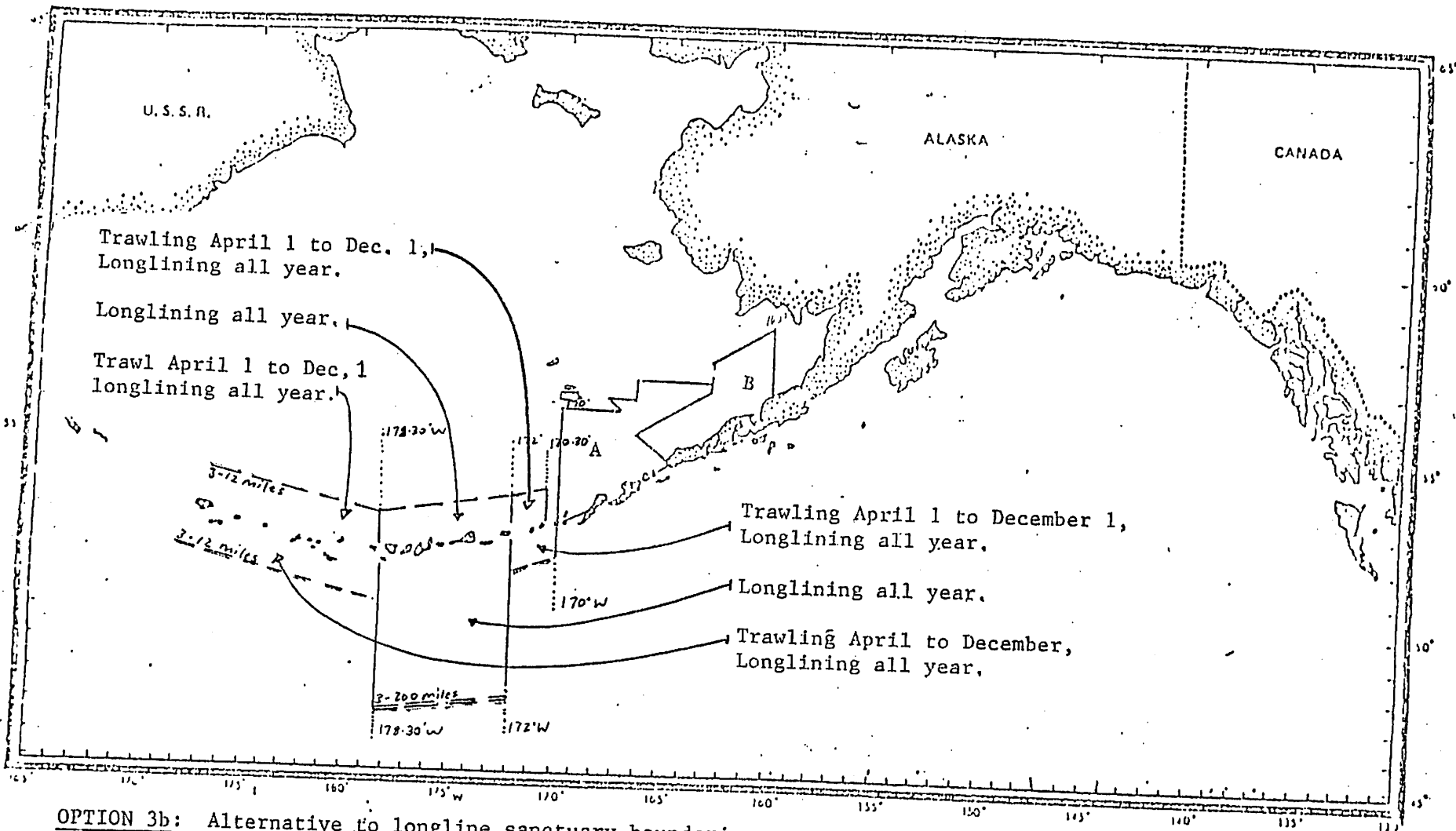


OPTION 2: PDT (October 17, 1978)  
 (A - Winter Halibut Savings Area)  
 (B - Bristol Bay Pot Sanctuary)



OPTION 3a: PDT Longline Sanctuary (March 28, 1979)  
 Supported by North Pacific Longline and Gillnet Association

- (A - Winter Halibut Savings Area)
- (B - Bristol Bay Pot Sanctuary)



**OPTION 3b:** Alternative to longline sanctuary boundaries supported by Japanese trawlers.

- (A - Winter Halibut Savings Area)
- (B - Bristol Bay Pot Sanctuary)



At that point (about July 1978) the longline sanctuary concept was introduced to the draft FMP and delineated as being between 172°W and 179°E (Agenda item 12, July 1978 Council meeting). Although the section dealing with the sanctuary was not phrased as an option in the Draft FMP, the Team considered it as such because it was believed that the Council could either accept or reject it.

During its February 1979 meeting, the PDT found that the proposed longline sanctuary would also reduce the incidental catch of king crabs in an area in which domestic king crab production had fallen to about 3 percent of former levels (18,000,000-600,000 pounds). Observer data indicates that in 1978 about 10,000 red and blue king crabs, averaging 2.2 pounds, were taken in the proposed sanctuary area by foreign trawlers (63 percent of which were taken between 178°30'W-179°00'E). Half of these, presumably, were males. The biomass of a king crab cohort is expected to increase by 65 percent between the time its individuals grow from 2.2 pounds to the average size at recruitment to the pot fishery. Therefore, the 5,000 male crabs taken by the trawl fishery represent some 18,150 pounds per year (5,000 x 2.2 x 1.65) of lost recruitment to the pot fishery, worth \$22,700 (@ \$1.25/lb). The 5,000 females (less losses due to natural mortality) represent lost reproductive potential to this depressed stock.

In addition to the red and blue crabs, about 65,000 golden king crabs (not currently exploited by the domestic fishery) are estimated to have been taken from the proposed sanctuary area in 1978 by foreign trawlers.

Balanced against potential red and blue king crab savings is a potential loss of groundfish production. In 1977, the foreign trawl catch in the proposed sanctuary was about 12,000 mt, 53 percent of which came from between 178°30'W and 179°00'E. Perhaps a third of that catch could be taken by longliners leaving 8,000 mt unharvested should trawling be prohibited. Although worth about \$1.8 million, this tonnage is only about one-half of one percent of the total groundfish OY for the Bering Sea/Aleutian Region.

Of the total foreign trawl fishery (excluding mothership operations) in the Bering Sea/Aleutian Region in 1977, 5 percent of the effort and 2 percent of the catch took place in the proposed sanctuary area (for Japan, 6 percent of the trawl effort and 2.5 percent of the trawl catch).

Finally, foreign catch reports for 1977 (the last year of complete record) show that of the total trawl activity in the proposed sanctuary, 98 percent of the effort and 90 percent of the catch was Japanese.

In summary, the proposed longline sanctuary (172°W-179°E) would:

1. Provide an area for longlining free of the risk of gear conflicts with trawlers.
2. Save 12,000 red and blue king crabs and 65,000 golden king crabs per year.



3. Result in a loss of groundfish production of about 8,000 mt ( $\frac{1}{2}$ % of the Region's total groundfish OY).
4. Displace about 5 percent of the Region's all-nation independent stern trawl effort but would not effect the mothership fisheries which do not operate in the Aleutians.
5. Affect primarily Japanese trawlers.

Japanese trawl groups have recently proposed that as an alternative, the longline sanctuary be reduced in size by  $2\frac{1}{2}$  degrees of longitude (i.e.  $172^{\circ}00'W-178^{\circ}30'W$ ). This would reduce the projected loss of groundfish production from 8,000 mt to 3,800 mt but would also reduce the projected saving of red and blue king crabs from 12,000 to 6,400 individuals, and golden king crabs from 65,000 to 48,000.

Associated with the longline sanctuary issue is the matter of foreign fishing within the 3-12 mile zone off the Aleutians. The PDT recommended that west of  $170^{\circ}30'W$  on the Bering Sea side and west of  $170^{\circ}00'W$  on the Pacific side of the Aleutians foreign fishing be permitted year-round<sup>1/</sup> to within 3 miles (i.e. to the outer boundary of the Territorial Sea). That recommendation, however, was made with the expectation that the longline sanctuary would prohibit trawling (both within and without the 3-12 mile zone) in that portion of the Aleutians between  $172^{\circ}W$  and  $179^{\circ}E$  and would provide adequate protection for king crabs and halibut. Should the longline sanctuary be substantially reduced in size or rejected, then it may be necessary to consider specific closures to foreign trawling within the 3-12 mile zone to protect halibut and crabs on certain grounds, recreational fisheries around Adak, and native fisheries around Atka. ADFG (through Phil Rigby) is looking into the crab situation in this regard and IPHC (through Steve Hoag) is doing the same for halibut.

The attached table provides a summary of the groundfish and incidental king crab catch data referred to above.

<sup>1/</sup> The Team no longer feels that the April and October closure is necessary.

Sincerely,

*Bea*

H. A. Larkins, Leader  
Groundfish Plan Development Team

cc: S. Hoag  
P. Rigby  
S. Pennoyer  
L. Low  
R. Bakkala

CATCHES IN PROPOSED LONGLINE SANCTUARY

<u>Area</u>	<u>1977 All-nation trawl catch (mt)</u>	<u>1978 estimated incidental king crab catch (nos.)</u>	
		<u>Red &amp; Blue</u>	<u>Golden</u>
178°30'W - 179°00'E	5,660	6,156	17,190
172°00'W - 178°30'W (Japanese trawler's proposal)	<u>6,424</u>	<u>3,757</u>	<u>47,660</u>
172°00'W - 179°00'E (PDT's proposal)	12,084	9,913	64,850

PERCENTAGE OF 1977 BERING SEA/ALEUTIAN FOREIGN TRAWL  
WITHIN PROPOSED 172W-179E  
LONGLINE SANCTUARY (excludes mothership operations)

	<u>Hours trawled</u>	<u>Reported catch</u>
(Japan Deep Sea Trawl)	(6)	(1.1)
(Japan Landbased Trawl)	(6)	(7.5)
Japan Total Trawl	6	2.5
USSR Total Trawl	1	1.1
ROK Total Trawl	1	0
All-nation Total Trawl	5	2.0



Foreign Trawl Operations During 1977<sup>1/</sup> (as reported)

	<u>Effort (hours)</u>				<u>Catch (mt)</u>			
	Japan	USSR	ROK	Total	Japan	USSR	ROK	Total
BS/Al Region	280,952	26,795	7,799	315,546	441,363	112,040	42,229	595,632
(%)	(89)	(8.5)	(2.5)	(100)	(74)	(19)	(7)	(100)
Aleutian Area	47,512	6,322	32	53,866	37,529	26,297	412	64,238
(%)	(88)	(12)	(+)	(100)	(58)	(41)	(1)	(100)
172°W-179°E <sup>2/</sup>	16,707	323	0	17,030	10,884	1,202	0	12,086
(%)	(98)	(2)	(0)	(100)	(90)	(10)	(0)	(100)
172°W-178½°W <sup>3/</sup>	10,674	97	0	10,771	6,024	401	0	6,425
(%)	(99)	(1)	(0)	(100)	(94)	(6)	(0)	(100)

1/ Does not include mothership or longline operations

2/ PDT's proposed sanctuary area

3/ Japanese trawler's proposed alternative

FILE	ACT	INFO	ROUTE TO	INITIAL
			Exec. Dir.	3
			A. Exec. Dir.	
			Adm. Off.	
			Exec. Sec.	
			Wh. I.	
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			Wh. IV.	
			Wh. V.	
			Wh. VI.	
			Wh. VII.	
			Wh. VIII.	
			Wh. IX.	
			Wh. X.	

AGENDA #14  
MAY 1979

April 28, 1979

MR. JIM H BRANSON  
EXECUTIVE DIRECTOR  
NPFMC  
SUITE 32  
POST OFFICE MAIL 333  
W. 4TH,  
ANCHORAGE ALASKA

MAY 3 1979  
CC: A4-L2V Kings m5-7-

Dear Mr. J.H. Branson,

We thank you very much for participating in the meeting, despite your busy schedule.

Please notice the enclosed copies of our comments and a letter of which we directly sent to Mr. Tillion (dated April 27, 1979). We will be most appreciated if you look through the copy for your reference.

We hope to receive your continued advice for developing our mutual relationships.

Sincerely Yours,

SHINJI ENDO  
PRESIDENT,  
HOKUTEN TRAWLERS ASSN.

*Wakada For Endo  
and Shibata.*

NAOMICHI SHIBATA  
REPRESENTATIVE,  
JAPAN DEEP SEA TRAWLERS ASSN.

April 27, 1979

WHILE IN JUNEAU  
POUCH V JUNEAU  
ALASKA 99811  
U.S.A.

Dear Mr. Clem Tillion,

We would like to express our great appreciation for participating in the meeting, despite your busy schedule.

Because of several typing mistakes, we could not submit our comments by Japanese Three Partys (dated April 10, 1979) to you. We hope you will excuse us for enclosing a newly retyped paper here.

Regarding the fishing operation in the area of West above 178°30' that we proposed in the meeting last time, we deeply appreciated your kind consideration. We would like to highly respect your further advice as to develop our relationship.

.....continue

We are sorry again for being delayed to send our comments. We esteem it as an honor to receive your continued advice to us.

Sincerely yours,

*Shinji Endo*

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Shinji Endo  
President  
Hokuten Trawlers Asso.

*N. Shibata*

---

Naomichi Shibata  
Representative  
Japan Deep Sea Trawlers Asso.

# JAPAN FISHERIES ASSOCIATION

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CABLE: DAISUKAI TOKYO

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April 10, 1979

Mr. Clement Tillion, Chairman  
North Pacific Regional Management Council

Dear Mr. Tillion:

We have reference to the matter of trawl restrictions in the vicinity of the Aleutian Islands in connection with the adoption of the FMP for the Bering and Aleutian Region.

We would like first to express our appreciation for the postponement given us to permit the coordination of views between the trawl fishery (Japan Deep-Sea Trawlers Association and the National Federation of Medium Trawlers) and the longline fishery (North Pacific Longline and Gillnet Association) -- both of which fall under the wing of this Association.

As representative of both these fisheries, we are pleased to convey to you the results of their joint deliberations and request that you give careful considerations to the conclusions reached. These conclusions are as follows:


- 1) The fundamental position of the longline fishery is in support of the Chartlet 2 plan, as contained in the final proposal from the previous Regional Council.
- 2) The fundamental position of the trawl fishery is one of opposition to any further strengthening of restrictions in this respect over the present level; this fishery would, in fact, like to have the existing restrictions eased.
- 3) Nevertheless, the trawl fishery, after taking into consideration your Council's desire to place restrictions on trawl operations and the course of deliberations on this subject within your Council, suggests the following compromise plan: viz.,



..... that the westernmost border of the 12 nautical mile area closed to trawl fishing (172°W to 179°E, as incorporated in the Chartlet 2 plan) be shifted to 178°30'W:

..... but that, at the same time, trawl operations in the 12 nautical mile area to the west of 178°30'W, including the 12 nautical mile area west of 179°E to as far west as 170°E, be restricted to the period April 1 - December 31.

4) The longline fishery, notwithstanding its basic position on this matter, will raise no objections in the event that your Council decides to consider the plan described in (3), as put forth by the trawl fishery.

  
Tomoyoshi Kamenaga  
President  
Japan Fisheries Association