

M E M O R A N D U M

TO: Council, SSC, and AP Members

FROM: Jim H. Branson
Executive Director

DATE: December 2, 1987

SUBJECT: Bering Sea/Aleutian Islands Groundfish Fishery Management Plan

ACTION REQUIRED

- A. NWAFC report on pollock stocks in international waters of the Bering Sea and implications for management.
- B. Review status of stocks and set ABCs.
- C. Consider action on proposal to raise OY for 1988.
- D. Set TACs, DAPs, JVPs, and TALFFS for 1988.

BACKGROUND

At this meeting the Council will set groundfish apportionments for the 1988 fishing year. Several background documents and presentations will be provided to assist in these decisions. The Northwest and Alaska Fisheries Center (NWAFC) will report on pollock stocks and harvests in the "donut hole" of international waters in the Bering Sea and their implications on management of BS/AI pollock harvest levels [item D-3(a)].

Item D-3(b)(1) is a worksheet provided for your use in setting TACs and subsequent apportionments; this worksheet can be used in concert with the computer spreadsheet to be displayed during your deliberations. Item D-3(b)(2) is a summary of the Resource Assessment Document (RAD) prepared by the plan team this November, which is updated from the draft presented in September. Table 7 within this summary, and the RAD itself, lists the plan team's recommendations for ABCs. Item D-3(b)(3) is a summary of public comments received on ABCs and initial apportionments released from the September meeting. Although the initial apportionments were the same as those approved for 1987 [item D-3(b)(4)], there are now new estimates of DAP requirements, discussed under item C-9, and JVP requirements, discussed under item C-10.

Item D-3(c) is a summary of a meeting that the Interim Action Committee held in October to consider placing a proposal to raise the upper limit of the optimum yield (OY) range for the 1988 fishing year on the agenda of this Council meeting. The Committee recommended that the Council consider the proposal at this time. Choices for implementing any change in OY for 1988 apparently involve an emergency rule, Secretarial amendment, or an accelerated plan amendment to take effect during the year.

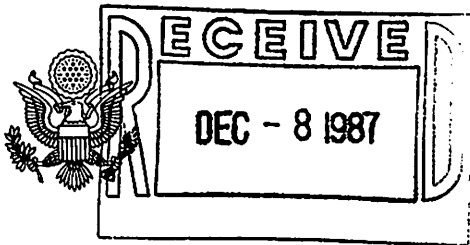
After setting ABCs and determining what upper limit to OY will be used for 1988, the Council needs to reaffirm DAP and JVP estimates, then set TACs and subsequent apportionments for 1988 [item D-3(d)].

Attached is a checklist for actions to be taken under item D-3 for Bering Sea/Aleutian Islands groundfish.

D-3 BERING SEA/ALEUTIAN ISLANDS GROUND FISH CHECKLIST

The Council needs to review and take action on the following items at this meeting.

<u>ITEM</u>	<u>TAB</u>
1. Overview of "donut hole" pollock.	D-3(a)
2. Review PT and SSC ABC recommendations. Set 1987 ABCs.	D-3(b) D-3(b)
3. Review DAP and JVP survey results.	C-9, C-10
4. Review proposals to increase OY. Set OY to be used for 1988.	D-3(c)
5. Set initial TACs.	D-3(b)
6. Set initial DAPs, JVPs, and TALFFs.	D-3(b)
7. Identify zero-TALFF/zero-JVP species and provide bycatch amounts to joint venture and foreign fisheries if necessary.	D-3(d)
8. Review TACs, DAPs, JVPs, and TALFFs and adjust as necessary.	D-3(d)
9. Approve 1988 TACs, DAPs, JVPs, and TALFFs.	D-3(d)



D-3a

United States Department of State

*Bureau of Oceans and International
Environmental and Scientific Affairs*

Washington, D.C. 20520

November 30, 1987

Mr. James O. Campbell, Chairman
North Pacific Fishery Management Council
Suite 2D, 411 West Fourth Avenue
Anchorage, Alaska 99510

Dear Jim:

In light of the Council's strong interest in the Bering Sea "donut" issue, I am writing to inform you of recent developments in the International North Pacific Fisheries Commission (INPFC).

During the INPFC's Annual Meeting in November, the Japanese Section proposed that a multilateral conference be held in Tokyo in February, 1988 to consider the establishment of an organization dealing with North Pacific pollock stocks, particularly those in the Aleutian Basin. The objective of the organization would be "cooperation for study, analysis and exchange of scientific information and views concerning pollock in the North Pacific Ocean." The Japanese Section proposed that the organization be formed under Article IV of the INPFC Convention and that the three INPFC member countries jointly invite China, Korea, Poland, and the Soviet Union to the conference.

The Canadian Section stated that it supports the concept in general and would be willing to participate in the proposed February meeting. Canada also proposed that the new organization should include other species and fisheries, in particular the high seas squid driftnet fisheries. In addition, the Canadian Section expressed its interest in also establishing a North Pacific science organization (PICES) with no management functions.

As we discussed during the September Council meeting, the Department has been considering all available means for addressing the "donut" issue. Because the Japanese proposal was provided only two days prior to the INPFC meeting, there has not been sufficient time to consult with all affected U.S. interests on this matter. During the INPFC meeting the U.S. Section noted its continuing concern over the increased harvests in the region and provided the following preliminary comments to the Japanese proposal:

"1). The Japanese proposal to limit the discussions to pollock appear to be too narrow. The U.S. view is that species in addition to pollock, including incidental catches of anadromous species and other living marine resources, must also be addressed.

2). The United States believes that it is very important that the Soviet Union, whose EEZ also abuts the donut region, be a participant in the preparation and conclusion of any arrangement involving fishing activities in the donut area. Accordingly, the U.S. government plans to consult soon with the Soviet Union regarding the Japanese proposal.

3). Because of the urgency in addressing the donut issue, the United States proposes that a meeting of government representatives take place in Washington D.C. in mid-December, near the time of the meeting scheduled by Canada in Ottawa to discuss PICES."

We had hoped to be able to complete consultations with U.S. interests and Soviet officials in time for a December meeting on this issue. However, it now appears that there will not be sufficient time and we have proposed that the December meeting be postponed. In the meantime, we would appreciate the views of the Council on the Japanese proposal. The State Department representative at the December Council meeting will be able to provide further details on this matter.

Sincerely,



Edward E. Wolfe
Deputy Assistant Secretary
Oceans and Fisheries Affairs

SUMMARY OF CURRENT KNOWLEDGE AND WORKING HYPOTHESES
CONCERNING POLLOCK IN THE BERING SEA

CATCH HISTORY

Catches in both the international zone and the entire U.S. FCZ are presented in table 1. (See figure 1 for a chart of the Bering Sea.) Pollock catches have increased tremendously in the international zone since 1982 with the largest increase from 1985 to 1986. The exact total caught in the international zone in 1986 and 1987 is unknown due to incomplete information. However, it is estimated that the total catch in the international zone may approach or even exceed the total catch in the entire U.S. FCZ of approximately 1.2 million metric tons.

The Japanese fishing season for pollock in the international zone is from November through the winter to April or May, with the peak period being January and February. In 1985, 71% of the total Japanese catch in the international zone occurred during this peak period. The fishery is primarily a roe fishery with a greater utilization of the whole fish occurring in recent years. The fish are either returned to Japan on ice or processed into surimi at sea. The majority of the Japanese catch has been in the southern half of the international zone (Sasaki and Yoshimura 1987).

An estimated 148 fishing vessels were involved in the international zone pollock fishery during the period from December 1986 to March 1987. It was estimated that of those 148 vessels, 91 were Japanese, 32 were Korean, 22 were Polish, and 2 were from the People's Republic of China (Sasaki and Yoshimura 1987).

SURVEY OBSERVATIONS

Only medium to large pollock have been found in any quantities in surveys of the Aleutian basin, defined as that portion of the Bering Sea with a depth of 2,000 m or more. The size range in pollock sampled in the Basin has been 34-58 cm in the Japanese surveys during the summer of 1977, 1978, and 1979, and the winter of 1983 and 1987 (Okada 1986; Sasaki and Yoshimura 1987). The range in ages from the 1979 Basin survey was 3-9 years with 5, 6, 7 year-olds making up approximately 94% of the samples. In contrast, surveys on the shelf found a size range of 10-60 cm with the mode at 26-34 cm (2-3 year old fish) (Okada 1986). A joint U.S.-U.S.S.R. ichthyoplankton survey of the Basin and shelf in 1987 did find small numbers of juveniles in the Basin, but these numbers were dwarfed by the tremendous quantities found on the shelf (S. Hinckley, 7600 Sandpoint Way N.E., Bldg. 4, BIN15700, Seattle, WA 98115. Pers. comm. 1987).

TAGGING STUDIES

While many pollock have been tagged in the Bering Sea, relatively few have been recovered. In addition, very few pollock have been tagged in the Basin itself. There are only five recoveries of tagged pollock where the fish moved across political boundaries.

In September, 1982 NMFS tagged approximately 7,000 trawl-caught pollock in the southern shelf of the eastern Bering Sea, with four recoveries all from the same shelf/slope region (A. Shimada, 7600 Sandpoint Way N.E., Bldg. 4, BINCl5700, Seattle, WA 98115. Pers. comm. 1987).

In a 10-year period from 1966 to 1976, the Japanese have tagged a minimum of 17,000 pollock in the Bering Sea with 15 of those fish recaptured. Of those tagged, approximately 12,000 were tagged from trawls with 1 recapture and 5,000 were tagged using hand-lines with 14 recaptures (Yoshida 1979). The results are shown in figure 1. Only 2 pollock tagged in the Bering Sea have been recovered in the Basin. One was a fish tagged on the Soviet shelf that was recovered 4 years later in the Basin (Fisheries Agency of Japan 1977). The other Basin recovery was also tagged in the Soviet portion of the Bering Sea (T. Sasaki, Japan Fisheries Agency, 1000 Orido, Shimizu 424, Japan. Pers. comm. 1987). One other recovery from the Basin was that of a pollock that had been tagged off Hokkaido. Unfortunately most of the tagging in the Bering Sea had been completed long before there was any significant directed pollock fishery in the Basin. Thus the absence of many tag returns from the Basin may only indicate a lack of effort there. Two pollock tagged on the Soviet slope that were recaptured on the U.S. slope indicate that there is some interchange of fish between Soviet and U.S. waters, although it is unknown if those pollock spent any time in the Basin. Within the U.S. FCZ, no pollock tagged on the shelf/slope regions has been recovered in the Basin. One of four recaptured pollock which had been tagged on the U.S. northern slope was recovered on the U.S. southern slope, suggesting some movement between those areas. Northern and southern slope refer to that portion of the eastern Bering Sea with depths from 200 to 2,000 m that is north and south of the Pribilof Islands.

GENETIC STUDIES

Major genetic differences have been found between pollock from the waters around Hokkaido Island and those from the eastern Bering Sea (Iwata 1975), but no differences have been found among pollock in the eastern Bering Sea (Grant and Utter 1980). No studies have looked at pollock from the Basin.

GROWTH OBSERVATIONS

Differences in growth rates have been found among pollock in the eastern Bering Sea. While pollock from the Basin and north shelf/slope regions have similar growth rates, those rates are lower than those of pollock from the south shelf/slope region (Lynde et al. 1986).

SPAWNING OBSERVATIONS

In 1984 spawning occurred from January to March in the Basin, from March through June over the southern shelf/slope region and from June through August in the northern shelf/slope area. Pollock only mature one group of oocytes per year which are probably spawned over a period of a month. Significant migration is unlikely during active spawning. Thus it is improbable that an individual fish spawning in the Basin would then spawn again on the shelf (Hinckley 1986).

Fecundity differences have also been found between regions, with the Basin having a lower fecundity for the same body size than the shelf/slope areas. Within the shelf/slope areas, the northern slope had greater fecundity than the southern shelf/slope areas (Hinckley 1986).

WORKING HYPOTHESES

The following working hypotheses are thought to contain the range of possible relationships of pollock in the international zone of the Bering Sea to pollock elsewhere including the U.S. FCZ Basin area, U.S. FCZ shelf/slope, and the Soviet FCZ, both Basin and shelf/slope areas. The hypotheses are in order from the most restrictive (a separate international zone stock) to the most liberal (a single stock for the entire Bering Sea).

1) The international zone pollock are an independent stock. There is no evidence available that supports this most restrictive hypothesis. There is no oceanographic or biological feature that suggests that this human legal boundary coincides with any physical/biological boundary for pollock. However, it is important to point out that of the hypotheses considered here, this is the only hypothesis under which the harvest of international zone pollock would have no impact on the pollock in the U.S. FCZ.

2) The pollock in the Basin, including the U.S. and Soviet FCZ and the international zone, are an independent stock. This implies that international zone pollock mix with pollock in the U.S. and Soviet FCZ Basin areas. Under this hypothesis, harvest of pollock in the international zone would impact pollock in the U.S. FCZ Basin region. Observations of morphological differences between the shelf and Basin fish support this hypothesis (J. Traynor, 7600 Sandpoint Way N.E., Bldg. 4, BIN C15700, Seattle, WA 98115. Pers. comm. 1987). The number of young pollock found in the eastern part of the Basin including the international zone has been very small. However, the NWAFB has no knowledge of any surveys in the western part of the Basin that have looked for young pollock. Recruitment to the Basin population must come either from other areas within the Basin that have not been sampled or from areas outside of the Basin.

3) The international zone pollock are part of a Basin population and this population mixes with the stocks in the adjacent regions during some part of their life history; recruitment to the Basin comes from older-age fish on the shelf/slope areas. The eggs spawned by Basin fish might end up on the shelf/slope areas with the adults from those eggs making their way back to the Basin at age 3 or 4. Or possibly the eggs spawned in the Basin perish and all the recruitment to the Basin comes from adult fish that hatched from eggs spawned by shelf/slope pollock. Support for this hypothesis comes from the observation that there are very few young pollock found in the Basin, and from currents in the southeast Basin, a site of major spawning for Basin pollock, that lead up onto the southeastern slope (Royer and Emery 1984).

4) The Basin pollock and the north slope pollock are a single stock which is separate from the pollock in the southern shelf/slope region of the eastern Bering Sea.

This hypothesis is suggested by the finding of similar lengths-at-age for Basin and northern shelf/slope pollock, which are different from the lengths-at-age of southern shelf/slope pollock (Lynde et al. 1986).

5) The international zone fish and pollock elsewhere in the Bering Sea are part of a single stock. The interchange between Basin and shelf/slope areas might consist of Basin adults making seasonal migrations up onto the shelf/slope regions to feed and/or fish from the shelf/slope regions making seasonal migrations into the Basin to spawn. In addition recruitment to the Basin comes from older-age fish from the shelf/slope regions. Support for this hypothesis comes from two tag returns of pollock tagged on the Soviet shelf/slope that were recovered in the Basin, evidence which also supports hypothesis 3. Also the occasional observations of small lengths-at-age, similar to the lengths-at-age of Basin fish, among pollock spawning on the southern slope support this hypothesis. This hypothesis is not supported by the finding of different lengths-at-age and different fecundities between the different areas of the Bering Sea.

EVIDENCE TO GUIDE CURRENT MANAGEMENT OF EASTERN BERING SEA SHELF POLLOCK FISHERY

There is no conclusive information to provide any guidance about the long-term consequences of international zone harvests on the productivity of the eastern Bering Sea shelf area. Similarly, there is no conclusive information to reject the hypothesis of separate pollock stocks between the international zone and the eastern Bering Sea shelf. Answers to these questions cannot be obtained without additional research.

The NWAFRC concurs with the Bering Sea Plan Team's recommended 1988 ABC for pollock. A pollock harvest of this magnitude should not adversely impact the population in the short term.

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Table 1. POLLOCK CATCHES (t) IN THE BERING SEA

YEAR	-----INTERNATIONAL ZONE-----			-----U.S. FCZ-----
	JAPAN	KOREA	POLAND	ALL NATIONS
1980	2,401	12,509		958,279
1981	221	0		973,505
1982	1,298	2,934		955,964
1983	4,096	66,558		982,363
1984	100,899	80,317		1,098,783
1985	136,475			1,178,759
1986	697,967		163,249	1,189,355
1987 (Jan-April)			118,200	

Catches in tons. The People's Republic of China also fishes in the international zone but no information is available on it's catches. The U.S. FCZ includes both the eastern Bering Sea shelf region and that part of the Aleutian Basin within the U.S. 200 mile zone.

Source for Japanese and Korean catches: Sasaki and Yoshimura 1987.

Source for Polish catches: Presented by the Polish Commercial Attache at the September NPFMC meeting in Anchorage, AK., U.S.A.

Source for U.S. FCZ catches: Wespestad and Traynor 1987.

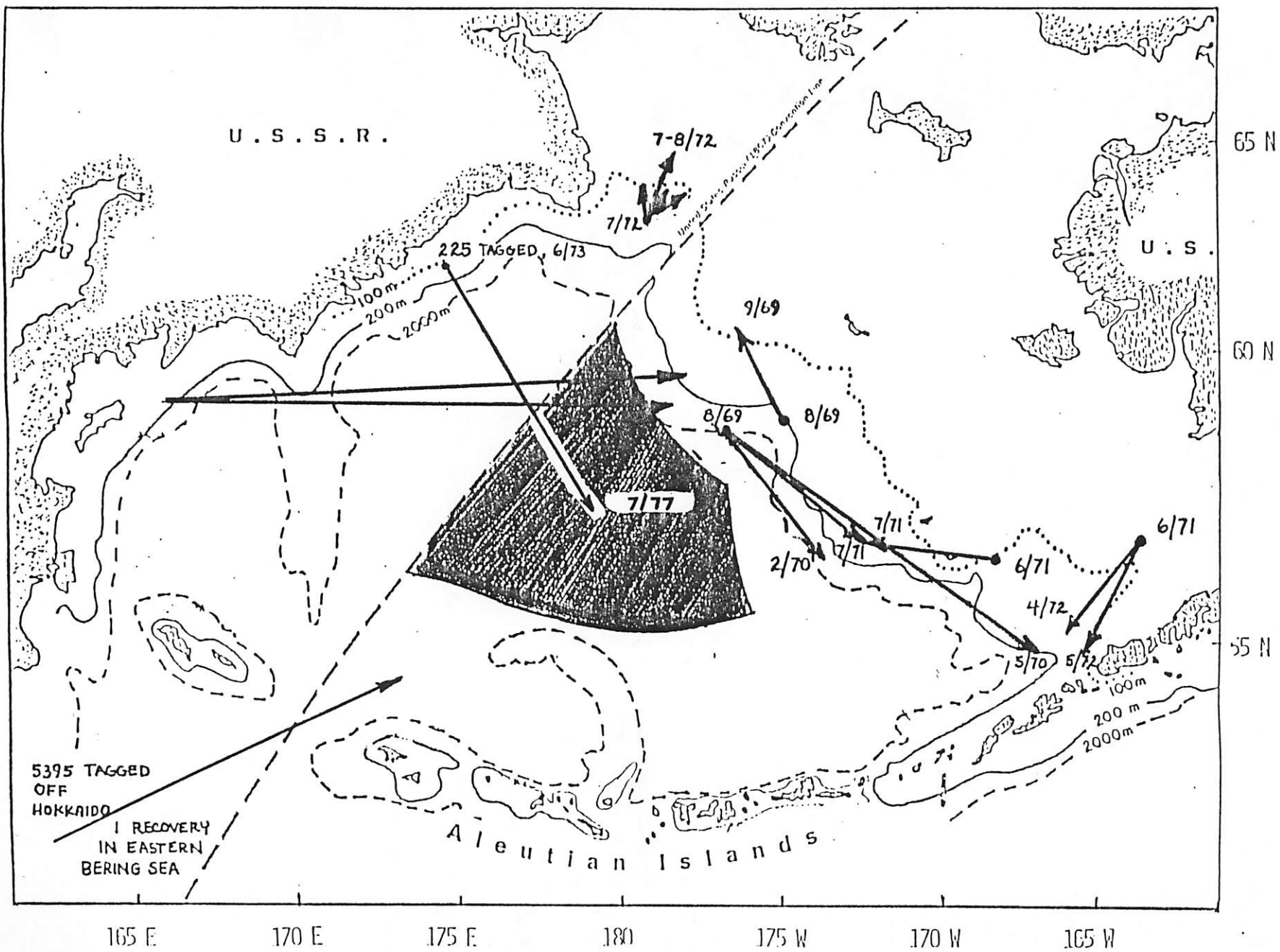


Figure 1. Japanese tag returns of pollock in the Bering Sea.