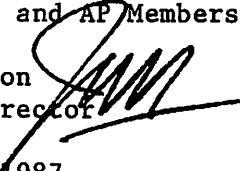


M E M O R A N D U M

TO: Council, SSC and AP Members

FROM: Jim H. Branson  
Executive Director 

DATE: December 2, 1987

SUBJECT: Bycatch Management

ACTION REQUIRED

Review report and recommendations of the Bycatch Committee.

BACKGROUND

The Council-appointed Bycatch Committee has continued development of bycatch management strategies in the Bering Sea/Aleutian Islands management area. The Committee has met in full session seven times for a total of 20 days and in subcommittee forum three times. They have received and reviewed extensive catch and bycatch data for the 1985-1987 fisheries, as provided by the NWAFC, ADF&G, and private industry.

The Committee has explored many different approaches to bycatch management including conventional measures, such as time/area closures and PSC limits, and more esoteric measures, such as selling bycatch or managing groups of fisheries as a complex. The Committee has also spent considerable time considering attendant issues to bycatch management such as accountability, retention or non-retention of bycatch, and the kind of management controls appropriate to the severity of the bycatch problem.

At this time the Committee is prepared to offer recommendations to the Council for the management of the bycatch of Tanner crab (C. bairdi and C. opilio), red king crab, and halibut in the Bering Sea/Aleutian Islands groundfish fisheries. These recommendations are specific to each of those species and are contained in a report from the Committee (Item C-7(a)) which will be provided to you during the meeting. Following presentation of this report by Chairman Larry Cotter the Council may wish to provide recommendations to incorporate these proposals into next year's amendment cycle.

REPORT AND RECOMMENDATIONS  
OF THE  
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL'S  
BYCATCH COMMITTEE

DECEMBER, 1987

## INTRODUCTION

At the December, 1986 North Pacific Fishery Management Council meeting, the Council expanded both the membership and the duties of the AP Bycatch Subcommittee. Renamed the Council's Bycatch Committee, the membership was expanded to include representation of most fisheries and gear groups from the Bering Sea and the Gulf of Alaska. The Committee's duties were likewise expanded to include the formation of recommendations to manage the bycatch of all species in all groundfish fisheries in the Bering Sea and the Gulf of Alaska. The Committee was to report back to the Council at the December, 1987 meeting.

By-Catch Committee members consist of:

Larry Cotter, Chairman  
Bill Woods  
Arni Thomson  
Chris Blackburn  
Barry Fisher  
Ed Fuglvog  
Bob Alverson

John Peterson  
Sam Wright (for Joe Blum)  
Harold Thompson  
Ted Evans/Bill Orr  
Dave Fraser  
Bill Jacobson  
Rich White

The Committee has met in full session seven times for a total of 20 days, and in sub-committee forum three times. Minutes and supporting documents from each meeting are available. Substantial fishery data was supplied by the Northwest/Alaska Fisheries Center, IPHC, NMFS, the State of Alaska, the Council, and private industry. By-catch control measures in practice in other fisheries and countries around the world were solicited and reviewed.

The Committee has explored many different approaches to bycatch management ranging from the traditional, such as time and area closures, caps, and gear restrictions, to the more innovative, such as selling bycatch or managing groups of fisheries as a complex. The Committee has also spent considerable time analyzing attendant issues to any bycatch control approach. Examples of these include ensuring appropriate accountability for determining the extent of bycatch removals and the retention, or lack thereof, of prohibited species.

The Committee has prepared recommendations for bycatch management of C. bairdi Tanner crab, C. opilio Tanner crab, red king crab, and halibut in the Bering Sea. The bycatch programs developed for each of the species are substantially similar in several key areas. This will become apparent as the recommendations are described. However, there are three issues which similarly affect the various programs and which should be addressed jointly:

1.) DAP Priority

If there is competition for bycatch between DAP and JVP, the Committee intends for DAP to have priority to bycatch providing that DAP needs are reasonable and reflect a genuine effort to minimize bycatch.

2.) Observers/Accountability

The Committee recognizes that accountability of bycatch removals is critical to the success of any bycatch management program. The Committee discussed many different methods of accounting for removals, but did not attempt to develop a recommended program. Regardless of the particular monitoring approach, however, it is the Committee's intent that all removals of Tanner crab, red king crab, and halibut be accounted for. This accounting will not only apply to the specific target fisheries listed below under each bycatch section, but to all fisheries which take these animals as bycatch.

3.) When/How Initial By-Catch Needs Are Determined

The cycle of events for the recommendations outlined below would commence in September of each year. Prior to the September Council meeting, the Plan Team would review the BS/AI RAD, bycatch data from that fishing year, and any other pertinent information, and would issue draft recommendations to the Council. These recommendations would include identification of tentative bycatch ceilings and parameters by species, and tentative bycatch needs by target fishery. The recommendations would be sent out for public review.

Prior to the December Council meeting, a Council committee charged with this obligation would convene, review the Plan Team's earlier recommendation, public comment, and all other pertinent data and



prepare a recommendation to the AP, SSC, and Council on bycatch needs for each target fishery.

The Council would take action on the issue at the December Council meeting.

### Committee Recommendations

The following is a explanation of how each of the recommendations work:

#### C. Bairdi Tanner Crab:

The first step is to use the summer trawl survey to determine the total C. bairdi population.<sup>1</sup> The trawl survey which occurs in one calendar year establishes the population figure to be used for the following calendar year's bycatch calculations.

Once the C. bairdi population has been established, a maximum of one percent of that population, subject to the following provisions, is allocated as potential bycatch in the groundfish fisheries. The one percent figure, if actually removed from the C. bairdi population, represents a subsequent potential loss of two to four percent of the total harvestable C. bairdi population. This means the directed crab pot fishery is guaranteed a minimum of 96% of the harvestable adult population.

*access to*

Although this management program allows for a maximum of one percent of the C. bairdi population to be taken as bycatch in all designated target fisheries, the Committee purposely differentiates between those C. bairdi bycatch removals less than .75% and those which are greater than .75% but less than 1%. Bycatch control management measures which may be imposed by the Regional Director are intended by the Committee to normally be more restrictive and burdensome when bycatch removals will fall between .75% and 1% than when the bycatch removals stay below .75%. It is the Committee's intent to encourage the full prosecution of each

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<sup>1</sup> It is the intent of the Committee that the best possible scientific information be used in assessing the stock of C. bairdi. This will include the existing NMFS survey but may also include additional stock assessment surveys and analysis.

target fishery's TAC with as little bycatch regulation as possible. Nevertheless, bycatch removals in excess of .75% of the C. bairdi population, although allowed, are subject to more stringent controls so as not to exceed 1% of the population ceiling.

The second step is to determine the anticipated C. bairdi bycatch needs for each of the designated target fisheries<sup>2</sup> covered by the program. This is accomplished by determining an expected bycatch rate for each target fishery. The expected bycatch rate reflects the preceding year's rate as adjusted by changes in the population of the target species and/or the population of C. bairdi; changes in gear technology, practice, or fishing patterns; or other relevant factors which might affect bycatch rates and needs. The bycatch rate so determined is then multiplied by the expected target species TAC to establish the anticipated C. bairdi bycatch needs, in numbers of animals, for that target species. This number of animals serves as an initial C. bairdi bycatch allocation to that particular target fishery.

This process is followed for each of the designated target fisheries. The anticipated bycatch needs for each of those fisheries are then added together to determine the total anticipated C. bairdi bycatch needs for that year. The following management scenarios may then apply:

A.) If the total anticipated C. bairdi bycatch needs are less than .75% of the C. bairdi population as determined above, the target fisheries will proceed without constraint other than being monitored regarding their bycatch removals. If a target fishery concludes without reaching or exceeding its bycatch allocation the fishery concludes harmoniously for the year.

B.) If, during the course of a fishing season, a target fishery will be unable to harvest its entire TAC without an additional bycatch allocation, the Regional Director will review<sup>3</sup> the fishery to determine the reason(s) for the greater than anticipated bycatch needs and estimate the additional number of bycatch animals that particular fishery needs to fully prosecute its TAC. The Regional

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<sup>2</sup>Designated target fisheries are the bottom trawl fisheries for yellowfin sole and other flatfish (excepting rock sole), pollock, Pacific cod, and rock sole.

<sup>3</sup> It is the Committee's intent the Regional Director conduct his review in advance of the target fishery reaching its initial C. bairdi by-catch cap in order for the target fishery to continue to operate without interruption.



Director shall allow the target fishery to continue and shall specify regulatory or other conditions for continuation of that fishery which "appropriately" address the reason(s) the target fishery's initial bycatch needs were insufficient; providing the total bycatch needs of that target fishery and the total allocated bycatch needs for all other designated target fisheries combined is, or remains, less than .75% of the C. bairdi population.

By using the word "appropriately" the Committee intends to provide the Regional Director with the latitude implied: the Regional Director should have the ability to set in place management conditions which are appropriately commensurate with the reason(s) the anticipated bycatch needs were insufficient.

As discussed above, the Committee views total bycatch removals less than .75% differently from removals in excess of .75%. The Committee recognizes that a variety of legitimate reasons, including a simple mistake at the initial point of estimating a target fishery's anticipated bycatch needs, may contribute to that fishery's bycatch needs being greater than anticipated. In such instances, the Committee assumes the conditions imposed by the Regional Director would not be burdensome to the fishing vessels involved. However, if the Regional Director determines the excess bycatch needs are not the result of legitimate factors (e.g., willful neglect of bycatch considerations by the fishing vessel(s) involved) the conditions imposed may be substantially more restrictive, and may include the types of conditions normally associated with bycatch needs in excess of .75% as described below.

C.) If, in advance of the season, the anticipated bycatch needs for all target fisheries combined fall or are likely to fall within the range of .75% to 1% of the C. bairdi population the Regional Director, in consultation with the Council, shall implement bycatch control measures on the target fisheries which are designed to maximize target harvests while minimizing bycatch removals, and, in any event, ensure that total bycatch removals do not exceed 1%.

The types of management conditions contemplated here are intended to "manage" bycatch removals as opposed to overseeing or monitoring bycatch. Therefore, the bycatch management measures used will normally be more restrictive, such as required observers, time/area closures, and bycatch rate limits.

Unlike target fisheries in Section B above, a target fishery in these circumstances, which has reached its initial bycatch allocation, will be shut down for the remainder of the fishing year or until additional bycatch becomes available.

D.) In the event that pre-season aggregate bycatch projections are estimated to be less than .75% of the total C. bairdi population and those projections are subsequently realized inseason to be incorrect and greater than .75% of the total C. bairdi population, the Regional Director shall undertake and complete a review of all target fisheries as outlined in Section B above and implement management conditions as outlined in Section C above.

E.) If, in advance of the season, the anticipated bycatch needs for all target fisheries combined exceed 1% of the C. bairdi population, the bycatch rates established for each target fishery shall be reviewed and modified as appropriate until the total anticipated bycatch needs combined are less than 1%.

#### C. Opilio Tanner Crab:

The Committee recognizes that the biomass estimates for C. opilio have been very volatile during the past four years. Additional information is needed regarding this species.

Given the size of the C. opilio biomass according to recent surveys and the need for additional information, the Committee requests NMFS provide it with summaries of new biomass estimates and bycatch results by October 1, 1988 so that, if necessary, a responsible management regime can be developed at that time.

#### Halibut:

In most respects, the Committee's recommendation for management of halibut bycatch follows the same format as C. bairdi. One major difference, however, is that in the case of halibut we recommend managing on the basis of bycatch *mortality* as opposed to *numbers*. The Committee recommends that there be a halibut mortality cap of 3,900 mt in the Bering Sea/Aleutian Islands.

There is inadequate information available to make biomass estimates on sub-legal halibut and to index the cap on total halibut biomass.



This should be addressed. It is the Committee's desire that the above cap be indexed to halibut populations when appropriate information is developed.

The Committee has adopted the NMFS assumptions regarding the bycatch mortality of halibut: fisheries with cod-end transfers or long towing times result in 100% mortality rates; shorter tows and rapid sorting results in a 50% mortality rate; and catch by longline gear results in a 25% mortality rate. It is the intention of the Committee that these rates be adjusted as better information on actual handling mortality becomes available. Therefore, the halibut bycatch amounts taken by each of the target fisheries<sup>4</sup> will be recalculated annually to reflect the changes in mortality.

The process used for determining halibut bycatch needs in *numbers of animals* for each target fishery is exactly the same as used for C. bairdi. Once the actual numbers have been determined, however, they are multiplied by the mortality rate applicable to that particular target fishery to determine the halibut *mortality needs* in numbers of animals of that target fishery. These numbers are then converted to weights using the average weight of the halibut taken as bycatch in each of the target fisheries. Thereafter, the program is the same as outlined for C. bairdi except that instead of using 1% and .75%, the halibut measures use 3,900 mt and 2,925 mt, respectively (total mortality).

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The Committee recommends this program be reviewed in three years time such that any amendment to this procedure take place on January 1, 1992.

Red King Crab:

The spirit of the red king crab measures are similar to those suggested above for C. bairdi. In particular, there will be a preseason assessment of the red king crab bycatch needs for each of the target fisheries (as in the C. bairdi section above). The procedure that follows differs, however, in that: 1) an explicit JVP cap is specified, and, 2) DAP bycatch of red king crab is monitored but

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<sup>4</sup> Designated target fisheries apply to TALFF, JVP, and DAP. They are the bottom trawl fisheries for yellowfin sole and other flatfish, rock sole, turbot/arrowtooth flounder, and Pacific cod, and the longline fishery for Pacific cod.

bycatch controls are not used until one of three possible "trigger points" is reached. The specifics are:

A.) The program is limited to fisheries that take place in Zone 1.

B.) An upper limit or cap for the JVP fishery for yellowfin sole and other flatfish will be calculated as 0.5% of the red king crab population, and a cap for all other JVP fisheries shall be 0.25% of the red king crab population. The JVP fisheries shall be managed to control bycatch in as restrictive a manner as used when the bycatch needs of C. bairdi exceed 0.75% of the C. bairdi population (see section C, C. bairdi, p. 5). The caps determined above will be reduced as the JVP proportion of the total TAC is reduced. For example, if JVP takes 100% of the yellowfin sole and other flatfish then JVP would receive 100% of the 0.5% cap. If, in a subsequent year, the JVP portion of the TAC for yellowfin sole and other flatfish were 50%, JVP would receive 50% of the 0.5% cap, or 0.25% of the red king crab population as an upper limit on bycatch.

C.) A management regime for DAP will be established when any one of the following events occurs:

1.) the DAP harvest of yellowfin sole equals 25% or more of the Zone 1 total yellowfin sole harvest.

2.) the DAP bycatch in the Zone 1 yellowfin sole fishery equals .3% or more of the red king crab population; or

3.) the combined DAP harvest of cod, pollock, and other flatfish in Zone 1 is equal to 225,000 mt or more.

When any of these triggers are reached, the bycatch committee will reconvene to determine appropriate DAP red king crab bycatch control measures to be recommended to the Council for implementation. At the same time, the Regional Director will institute bycatch measures for red king crab for the DAP fishery or fisheries which triggered the review. The measures chosen by the RD to control bycatch will continue until the Council is able to act upon the Committee's recommendations; will be appropriate to the severity of the bycatch problem identified; and will be in the spirit of the C. bairdi bycatch controls, taking into account total red king crab removals.

D.) DAP will implement a bycatch monitoring system in Zone 1. This monitoring system will include verification by a minimum of 10% on-board audit<sup>5</sup> in the yellowfin sole fishery. Bycatch information in the aggregate will be made public.

E.) The area between 160° - 162° degrees W will remain closed except for the Port Moller cod fishery out to 25 fm. The Committee intends to review the impact of extending the 25 fm line to 30 fm and determine whether or not to make a recommendation to modify this provision.

F.) It is the intent of the Committee to account for and prevent undue bycatch mortality, therefore the Committee will continue to explore the effectiveness of further protection of red king crab during the molting season. The Committee asks that NMFS, the NWAFC, and ADF&G provide it with all available data on molting crab, including information on unobserved mortality, by October 1, 1988, and that NMFS direct its observers to collect information on molting crab, so that, if necessary, a responsible management regime can be developed at the same time the Committee considers C. opilio bycatch management.

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<sup>5</sup> Rounded up to the next incremental observer.

**APPENDIX A**

**COMMITTEE MOTIONS**



A MOTION  
FOR CONTROL OF THE BYCATCH OF  
C. BAIRDI TANNER CRAB  
IN THE BERING SEA GROUND FISH FISHERIES

Bycatch Committee  
North Pacific Fishery Management Council  
October 1987

The total number of animals which may be removed as bycatch from all target fisheries combined in any year shall not exceed 1% of the total C. bairdi Tanner crab population as determined by the preceding year's summer trawl survey.

For each fishing year the following will occur:

1. Determine the sum of the anticipated bycatch needs for each target fishery which take C. bairdi Tanner crab as bycatch.

The target fisheries are the bottom trawl fisheries for yellowfin sole and other flatfish, pollock, Pacific cod, and rock sole.

The anticipated bycatch needs for each fishery will be the expected target species allocation to that fishery multiplied by the anticipated bycatch rate (animals/mt of target species) in that fishery. The bycatch rate used shall be the last year's observed rate (or an estimate of that rate) adjusted according to the following criteria:

changes in

- (1) the population of the bycatch species;
- (2) the population of the target species;
- (3) gear technology or practice which bear on the bycatch rate;
- (4) fishing patterns which bear on the bycatch rate;

or

- (5) any other relevant considerations.

2. Determine whether the sum of the anticipated bycatch needs for all target fisheries combined is likely to exceed .75% of the C. bairdi Tanner crab population.

If the anticipated needs are less than .75% then the following procedures shall apply:

The progress of each target fishery relative to the level of target catch and the level of allocated bycatch shall be monitored. If the target fishery concludes without exceeding its bycatch allocation the

fishery concludes for the year. If the Regional Director determines the target fishery will be unable to conclude due to greater than anticipated bycatch needs, the Regional Director shall conduct a review of the fishery to determine the reason(s) for the greater than anticipated bycatch needs. The Regional Director shall allow the target fishery to continue and shall specify conditions for continuation appropriate to the reason(s) the target fishery bycatch needs are exceeded, providing the total bycatch needs of the target fishery and all other target fisheries do not exceed .75% of the C. bairdi Tanner crab population.

If the anticipated needs exceed or are likely to exceed .75% of the biomass of C. bairdi Tanner crab the Regional Director shall, in consultation with the Council, implement bycatch control measures which are designed to minimize bycatch and maximize target harvests. Such implementation may take place at the start of the fishing year or inseason. The bycatch control measures may include, but not be limited to, required observers, time/area closures, and bycatch rate limits.

A MOTION  
FOR CONTROL OF THE BYCATCH OF  
HALIBUT IN THE  
BERING SEA GROUND FISH FISHERIES

Bycatch Committee  
North Pacific Fishery Management Council  
October 1987

The halibut mortality cap for the Bering Sea/Aleutian shall be 3,900 mt.

Biological data on halibut populations at this point is inadequate for making biomass estimates for sub-legal halibut. It is the desire of the Committee that the cap be indexed to halibut populations when the appropriate method is found.

Until better information is available, we assume that: fisheries with cod-end transfers or long towing times cause 100% mortality on halibut taken as bycatch; shorter tows and rapid sorting cause 50% mortality; and longline gear is assumed to cause 25% mortality on halibut taken as bycatch.

As the proportion of the catch taken by factory trawlers and shorebased vessels increases, we assume that halibut bycatch mortalities will diminish. Therefore, the bycatch amounts for each target fishery will be adjusted annually to reflect any mortality changes.

For each fishing year the following will occur:

1. Determine the sum of the anticipated bycatch needs for each target fishery which take halibut as bycatch. Target fisheries shall be defined as bottom trawl fisheries for yellowfin sole and other flatfish, rock sole, turbot/arrowtooth flounder, and Pacific cod, and the longline fishery for Pacific cod.

The anticipated bycatch needs for each fishery will be the expected target species allocation to that fishery multiplied by the anticipated bycatch rate (kg/mt of target species) in that fishery.

The bycatch rate used shall be the last year's observed rate (or an estimate of that rate) adjusted according to the following criteria:

changes in

1. The population of the target species;
  2. gear technology or practice which bear on the bycatch rate;
  3. fishing patterns which bear on the bycatch rate; or
  4. any other relevant consideration.
2. Determine the anticipated mortality of the bycatch needs for each fishery by multiplying each anticipated bycatch need by the mortality rates specified above.

3. Determine whether the sum of the anticipated bycatch mortality for all target fisheries combined is likely to exceed 75% of the halibut limit of 3,900 mt.

If the anticipated needs are less than 75% then the following procedures shall apply:

The progress of each target fishery relative to the level of target catch and the level of allocated bycatch shall be monitored. If the target fishery concludes without exceeding its bycatch allocation the fishery concludes for the year. If the Regional Director determines the target fishery will be unable to conclude due to greater than anticipated bycatch needs, the Regional Director shall conduct a review of the fishery to determine the reason(s) for the greater than anticipated bycatch needs. The Regional Director shall allow the the target fishery to continue and shall specify conditions for continuation appropriate to the reasons the target fishery bycatch needs are exceeded providing the total bycatch needs of the target fishery and all other target fisheries do not exceed 75% of the halibut cap of 3,900 mt.

If the anticipated needs exceed or are likely to exceed 75% of the halibut cap of 3,900 mt, the Regional Director, in consultation with the Council, shall implement bycatch control measures which are designed to minimize bycatch and maximize target harvests. Such implementation may take place at the start of the fishing year or inseason. The bycatch control measures may include, but not be limited to, required observers, time/area closures, and bycatch rate limits.

If there is any TALFF and the calculated bycatch needs indicate a need for some restrictions, those restrictions will be made on TALFF in January inseason management.

This program will be reviewed in three years time such that any amendment to this procedure should take effect on January 1, 1992.