AGENDA D-1(d-g)
APRIL 2003

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
Executive Director

DATE: March 21, 2003

SUBJECT: Groundfish Issues

ESTIMATED TIME
8 HOURS
(all D items)

ACTION REQUIRED

(d) Review request(s) for Exempted Fishing Permits
(e) Recommend VIP rates for latter half of 2003
(f) SSC comments on National Standards 1 guidelines
(g) Discuss and identify research priorities

BACKGROUND

(d) Review request(s) for Exempted Fishing Permits

NMFS recently received two requests for exempted fishing permits (EFPs). The first request was from Trevor Jones of the Alaska Food Coalition, to test the application of the Prohibited Species Donation Program for halibut taken in Gulf of Alaska trawl fisheries. The EFP would authorize participating vessels to sort halibut at sea and retain the dead halibut for delivery to shoreside processors for donation to foodbanks. NMFS disapproved the EFP application based on legal concerns relative to IPHC regulations (letter attached as Item D-1(d)(1)).

The other EFP application was from United Catcher Boats, who is seeking an EFP to test a salmon excluder device in the BSAI pollock trawl fishery. Copies of the application were mailed out to you last week. NMFS has requested that the Council review the application and provide comments (Item D-1(d)(2)).

(e) Vessel Incentive Program rates for second half of 2003

The Vessel Incentive Program (VIP) to reduce Pacific halibut and crab bycatch rates in the BSAI and GOA trawl fisheries requires that bycatch rate standards be specified for purposes of vessel accountability under the VIP. The bycatch rates for the first half of 2003were specified by NMFS for the start of the 2003 trawl fisheries. NMFS plans to publish the rates for the second half of 2003 in the *Federal Register* by July 1, 2003. These rates have remained unchanged since 1995. A summary table of 1999 - 2003 observer data on fishery bycatch rates and the bycatch rate standards is attached as Item D-1(e)(1).

(f) SSC comments on National Standards 1 guidelines

NOAA Fisheries recently published an advanced notice of proposed rule making for revision of the National Standard 1 guidelines, also known as the overfishing definitions (the Federal Register notice is attached as Item D-1(f)(1)). They are requesting comments on the effectiveness and appropriateness of the guidelines. Because the comment period was extended for an additional 30 days (through April 16), the SSC and Council will have an opportunity to provide comments to NMFS. In May 2000, the Council sent a letter to NMFS regarding the SSC's concerns with the existing overfishing guidelines (attached at Item D-1(f)(2)). We may want to sent a letter reiterating these concerns. Comments from the Western Pacific Council are provided as Item D-1(f)(3).

(g) Review research priorities

The BSAI and GOA Groundfish Plan Teams revised the current list of research priorities during its November 2002 joint meeting (Item D-1(g)(1). No revisions were provided by the Crab Plan Team. After receiving comments from NMFS and the SSC at this meeting, the Council will forward the priorities to NOAA for use in preparing its annual budget, as well as to the North Pacific Research Board (NPRB). These would be in addition to the thematic list of priorities drafted by Dr. Fluharty and approved by the Council in October 2002, which were forwarded to the NPRB.

National Oceanic and Atmospheric
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

AGENDA D-1(d)(1)
APRIL 2003

March 14, 2003

Mr. Trevor Jones
Alaska Food Coalition
1944 E. Rezanof
Kodiak, Alaska 99615

Re: Application for an Exempted Fishing Permit

Dear Mr. Jones:

We have reviewed your application package dated March 11, 2003, for an exempted fishing permit (EFP). The quality of the application shows that a tremendous amount of time and effort has been put into developing the proposal, including coordination with fishing industry, food banks, and NMFS staff. Unfortunately, we are unable to further consider your application for an EFP due to legal reasons. The following is an explanation of legal concerns that must be resolved before further consideration of your application.

Your requested EFP would authorize participating groundfish trawl vessels to sort dead halibut at sea and retain the dead halibut for delivery to shoreside processors through the halibut donation program authorized at 50 C.F.R. 679.26. The EFP would provide exemption from federal groundfish regulations that would otherwise require vessels to sort out halibut at sea and return all halibut to the sea regardless of condition. (50 C.F.R. 679.21(b)(2)(ii)). However, regulations of the International Pacific Halibut Commission (IPHC) impose additional restrictions on the take of halibut with trawl gear and possession of halibut aboard trawlers. Section 19(2) of the 2003 IPHC regulations provides that "[n]o person shall possess halibut taken with any gear other than hook and line gear." 68 Fed. Reg. 10998 (March 7, 2003). Section 19(3) of the 2003 IPHC regulations provides in pertinent part that "[n]o person shall possess halibut while on board a vessel carrying any trawl nets or fishing pots capable of catching halibut . . . ." Id. The only exception to these prohibitions in the IPHC regulations is under Section 19(11) which states that "([n]otwithstanding any other provision in these regulations, a person may retain and possess, but not sell or barter, halibut taken with trawl gear only as authorized by the Prohibited Species Donation regulations of the National Marine Fisheries Service." At the time these regulations were developed in coordination with the IPHC, it was understood that the only halibut this would apply to is halibut delivered to shoreside processors by trawl catcher vessels that were unable to sort their catch at sea (65 FR 78119, December 14, 2000, column 2, last paragraph).

An EFP issued pursuant to the Alaska groundfish fishery regulations implementing the Magnuson-Stevens Fishery Conservation and Management Act cannot exempt the EFP holder from compliance with regulations of the IPHC. The IPHC develops its halibut fishery regulations pursuant to the Convention Between the United States of America and Canada for the

Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea, signed at Ottawa on March 2, 1953, and amended by the Protocol Amending the Convention, signed at Washington, D.C., on March 29, 1979. Article I(1) of the Convention provides in pertinent part that "[a]ll fishing for halibut . . . in Convention waters as herein defined is prohibited except as provided in paragraphs 2 and 5 of this Article." Convention waters include the exclusive economic zone off Alaska in which the EFP would authorize the exempted fishing activity. Article I(2) provides in pertinent part that "[n]ationals and fishing vessels of, and fishing vessels licensed by, the United States or Canada may fish for halibut in Convention waters only in accordance with this Convention, including its Annex, and as provided by the International Pacific Halibut Commission in regulations promulgated pursuant to Article III of the Convention . . .. However, it is understood that nothing contained in this Convention shall prohibit either Party from establishing additional regulations, applicable to its own nationals and fishing vessels, and to vessels licensed by that Party, governing the taking of halibut which are more restrictive than those adopted by the International Pacific Halibut Commission." (emphasis added). Because your requested EFP would authorize retention of trawl-caught halibut aboard trawl vessels - an activity prohibited by current IPHC regulations - issuance of the EFP would be inconsistent with Articles I(1) and (2) of the Convention.

To further pursue your proposal to retain dead halibut sorted at sea on trawl vessels for the prohibited species donation program, you will need to obtain approval from the IPHC. The IPHC meets each January to develop annual management measures for the halibut fishery. The next annual meeting is scheduled for January 20-23, 2004 in Juneau, Alaska. An interim meeting also is scheduled for November 18-19, 2003, in Seattle, Washington.

To find more information about the IPHC, you may access their website at http://www.iphc.washington.edu/halcom/default.htm. We would be willing to provide you additional information to the extent we can. If you are able to receive approval on your concept from the IPHC, we will be able to further consider your proposal. We appreciate your efforts to reduce the disposal of dead halibut at sea and provide high quality food to underprivileged individuals. We also appreciate how frustrating our regulatory process and constraints must seem.

Sincerely

James W. Balsiger
Administrator, Alaska Region

cc: North Pacific Fishery Management Council

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

AGENDA D-1(d)(2)
APRIL 2003

March 17, 2003

David Benton, Director
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Alaska 99501

Dear Mr Benton:

We have received an application from Mr. John Gauvin and Mr. Brent Paine for an Exempted Fishing Permit (EFP) to test a salmon excluder device in the Bering Sea pollock trawl fishery. Issuance of EFPs is authorized by the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutians Islands Area and its implementing regulations at 50 CFR part 679.6, Exempted Fisheries.

Under regulations at § 679.6, we have consulted with the Alaska Fisheries Science Center (AFSC), and have determined that the application contains all the information necessary to judge whether the proposal constitutes a valid fishing experiment appropriate for further consideration. We are initiating consultation with the North Pacific Fishery Management Council (Council) by forwarding the application to you as required by regulations. We understand that you have tentatively scheduled Council review of the attached application on the Council's April 2003 agenda in anticipation of our review and determination that the application warrants further consideration and consultation with the Council.

Please notify Mr. Gauvin and Mr. Paine of your receipt of the application and invite the applicant to appear before the Council in April in support of the application if the applicants desire. We will publish a notice of the application in the Federal Register with a brief description of the proposal. Attached is a copy of EFP proposal, as well as the AFSC's approval of the experimental design.

Sincerely,

James W. Balsiger
Administrator, Alaska Region

Attachments

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Alaska Fisheries Science Center
7600 Sand Point Way N.E.
BIN C15700 F/AKC
Seattle, Washington 98115-0070

March 14, 2003

MEMORANDUM FOR: James W. Balsiger
Administrator, Alaska Region

FROM: for Douglas P. DeMaster
Science & Research Director, Alaska Region

SUBJECT: Review of Exempted Fishing Permit to Test Salmon Excluder

John Gauvin and Brent Paine submitted a draft application for an Exempted Fishing Permit (EFP) to test a salmon excluder device for review by the Alaska Fisheries Science Center. The proposed EFP is for testing a salmon excluder device in the Bering Sea/Aleutian Islands pollock trawl fishery. The draft was reviewed by the RACE and REFM Divisions and comments were provided to the applicants that needed to be addressed to clarify a number of concerns we had with the proposed work. A revised plan has been received, and upon further review, now provides a solid approach for addressing the issue of salmon bycatch in the Bering Sea/Aleutian Islands pollock fishery.

The proposed test will be conducted in collaboration with Craig Rose of the RACE Division who has been working closely with industry over the past year in the development of a salmon excluder device. Craig's work has provided encouraging evidence that a successful means of reducing salmon bycatch in the pollock fishery can be developed and the testing of the salmon excluder device by industry as proposed in this EFP application is the next step in addressing this issue. Please let me know if you have any questions concerning the application and experimental design for the test.

cc: F/AKR2 - S. Salveson
F/AKC1 - G. Stauffer
F/AKC2 - R. Marasco

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

AGENDA D-1(e)(1)
APRIL 2003

March 14, 2003

Mr. David Benton
Chairman, North Pacific Fishery
Management Council
605 W. 4th Avenue, Suite 306
Anchorage, Alaska 99501-2252

Dear Mr. Benton:

Bycatch rate standards for trawl fisheries under the Pacific halibut and red king crab vessel incentive program (VIP) during the second half of 2003 are scheduled to be published in the Federal Register by July 1, 2003. A summary of 1999 - 2003 observer data on fishery bycatch rates is listed in Table 1 for review by the Council. The halibut bycatch rates for the four quarters of 2002 have been updated and the first quarter of 2003 added. This information is based on weekly assignments of vessels to a VIP target fishery based on weekly catch and reporting area as determined in the NMFS catch database.

The bycatch rate standards have remained unchanged since 1995. In October 2001, the Council reviewed extensive analyses prepared by NMFS staff on industry bycatch rates to assess whether or not these standards should be adjusted. The Council recommended that the bycatch rate standards should remain unchanged while the Council considers alternative incentive programs for bycatch avoidance. Based on this input, we intend to establish bycatch rate standards for the second half of 2003 that are unchanged from the second half of 2002 (Table 1).

Sincerely,

James W. Balsiger
Administrator, Alaska Region

Attachment

ATTACHMENT

Table 1 -- 1999 - 2003 (through March 14, 2003) observed bycatch rates, by quarter, of halibut and red king crab in the fishery categories included in the vessel incentive program. Also listed are the bycatch rate standards in effect since 1995.

Halibut Bycatch (Kilograms Halibut/metric ton Allocated Groundfish Catch

Fishery and quarter	Bycatch Rate Standards	1999	2000	2001	2002	2003
BSAI Midwater Pollock						
QT 1	1	0.15	0.05	0.13	0.08	0.09
QT 2	1	-	0.15	0.15	0.05	
QT 3	1	0.06	0.11	0.17	0.15	
QT 4	1	0.04	0.13	0.22	0.11	
BSAI Bottom Pollock						
QT 1	7.5	1.29	0.16	0.82	0.68	2.13
QT 2	5	-	4.50	1.89	-	
QT 3	5	3.87	0.68	3.17	0.74	
QT 4	5	0.13	1.95	0.63	12.44	
BSAI Yellowfin sole						
QT 1	5	4.21	6.21	19.74	5.21	11.60
QT 2	5	7.30	3.96	18.54	14.02	
QT 3	5	18.59	12.80	7.55	10.64	
QT 4	5	24.26	11.41	13.38	13.34	
BSAI Other Trawl Fisheries						
QT 1	30	14.54	8.19	11.04	10.22	16.23
QT 2	30	24.83	21.08	23.79	25.97	
QT 3	30	6.12	9.79	8.92	7.01	
QT 4	30	8.71	4.57	5.70	25.07	
GOA Midwater Pollock						
QT 1	1	0.31	0.04	0.17	0.02	0.02
QT 2	1	0.23	0.04	-	-	
QT 3	1	0.12	1.91	0.95	0.02	
QT 4	1	0.03	0.56	0.06	0.01	
GOA Other Trawl Fisheries						
QT 1	40	26.23	32.48	10.92	20.41	27.80
QT 2	40	58.88	58.87	56.84	66.77	
QT 3	40	37.98	18.14	27.46	22.93	
QT 4	40	58.20	69.04	56.85	36.81	
Zone 1 Red King Crab Bycatch Rates (number of crab/mt of allocated groundfish)						
BSAI Yellowfin sole						
QT 1	2.5	0.01	0.09	0.57	0.47	1.34
QT 2	2.5	0.03	0.01	0.08	1.76	
QT 3	2.5	0.43	1.08	0.04	-	
QT 4	2.5	0.15	0.25	1.12	0.68	
BSAI Other Trawl Fisheries						
QT 1	2.5	0.04	1.38	0.09	0.12	0.12
QT 2	2.5	0.06	0.20	0.00	0.72	
QT 3	2.5	0.25	0.00	0.07	0.00	
QT 4	2.5	0.02	0.00	0.00	0.00	

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 600

[Docket No. 030128024–3024–01; I.D. 121002A]

RIN 0648–AQ63

Fisheries of the United States; National Standard 1

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Advance notice of proposed rulemaking; consideration of revision to national standard 1 guidelines.

SUMMARY: NMFS announces that the agency is considering revisions to the national standard guidelines for national standard 1 that specify criteria for determining overfishing and establishing rebuilding schedules. There have been concerns expressed by the scientific community, fisheries managers, the fishing industry, and environmental groups regarding the appropriateness of some aspects of these guidelines, particularly in light of new issues arising from rebuilding programs that have been underway for several years. This action solicits public input on the effectiveness and appropriateness of the national standard 1 guidelines in complying with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

DATES: Comments must be submitted in writing by March 17, 2003.

ADDRESSES: Comments may be mailed to Mr. John H. Dunnigan, Director, Office of Sustainable Fisheries, Room 13362, 1315 East-West Highway, Silver Spring, MD 20910; or faxed to 301–713–1193. Comments will not be accepted if submitted via e-mail or Internet.

FOR FURTHER INFORMATION CONTACT: Mark R. Millikin, at 301–713–2341 or via e-mail at Mark.Millikin@noaa.gov.

SUPPLEMENTARY INFORMATION: National standard 1 reads, "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry." In 1996, the Sustainable Fisheries Act (SFA) amended the Magnuson-Stevens Act (16 U.S.C. 1801, *et seq.*) to, among other things, provide definitions for "overfishing" and modify the definition of "optimum yield." The Magnuson-Stevens Act, in section 303(a)(10), now requires each fishery management plan (FMP) to "specify objective and measurable criteria for identifying when the fishery to which the FMP applies is overfished." In addition, section 304(e) specifies requirements for rebuilding overfished fisheries. The revised national standard guidelines, including national standard 1, were proposed at 62 FR 41907, August 4, 1997, and published as final guidelines at 63 FR 24212, May 1, 1998.

As they currently exist, the national standard 1 guidelines provide definitions and require determination, to the extent possible, of maximum sustainable yield (MSY), or an acceptable surrogate; specification of status determination criteria including a maximum fishing mortality threshold and a minimum stock size threshold; ending overfishing and rebuilding overfished stocks; and specification of optimum yield (OY) in fisheries.

In response to the SFA, these national standard guidelines were implemented in 1998, over 5 years ago. Since that time, we have developed new perspectives, new issues, and new problems regarding their application. Concerns that have been identified for possible revision include, but are not limited to, the following:

1. The definition and use of the minimum stock size threshold (MSST) for determining when a stock is overfished. There has been considerable discussion about the utility of the concept of MSST, the definition of MSST contained in the guidelines, difficulties in estimating the MSST (especially in data-poor situations), and identifying appropriate proxies for MSST.

2. Calculation of rebuilding targets appropriate to the prevailing environmental regime. Currently, the guidelines do not address how rebuilding targets should accommodate changing environmental conditions. Rebuilding rates based upon current stock productivity may be inconsistent with rebuilding targets based upon historical stock productivity when there are persistent, long-term changes in environmental conditions.

3. Calculation of maximum permissible rebuilding times for overfished fisheries. The SFA established a maximum allowable 10–year rebuilding time for a fishery, except where the biology of the fish will not allow it or the fishery is managed under an international agreement. If the minimum time for a fishery to rebuild is 10 years or greater, the maximum allowable rebuilding time under the guidelines becomes the time to rebuild in the absence of any fishing mortality, plus one mean generation time. This has created a discontinuity where the difference in allowable rebuilding times between a stock with a minimum rebuilding time of 9 years and another stock with a minimum rebuilding time of 11 years, may be several decades in the case of long-lived species. This results in the need for much more restrictive management measures in the first case compared to the second, even though there is not much difference between them in terms of rebuilding potential.

4. The definitions of overfishing as they relate to a fishery as a whole or a stock of fish within that fishery. There are currently over 900 fish stocks identified for the purpose of determining their status with regard to overfishing, many of which are caught in small amounts and whose status is unknown. Combining assessments and status determination criteria for assemblages of minor stocks may make more sense biologically and economically than attempting to assess and manage them one by one. Further guidance is needed on the most ecologically sound and economically expedient ways to manage these fisheries.

5. Procedures to follow when rebuilding plans require revision after initiation, especially with regard to modification of the rebuilding time frame. The guidelines do not currently address what to do when observed rebuilding rates are greater or lower than expected or when new assessments change estimates of rebuilding targets or other parameters.

NMFS solicits input from the public regarding: (1) whether or not the national standard 1 guidelines should be revised and (2) if revisions are desired, what parts of the national standard 1 guidelines should be revised, how they should be revised, and why. NMFS will use the information in determining whether to proceed with a revision to the existing guidelines, and if so, the issues to be addressed.

This advance notice of proposed rulemaking has been determined to be significant for the purposes of Executive Order 12866.

Authority: 16 U.S.C. 1801 *et seq.*

Dated: February 10, 2003.

John Oliver,

Deputy Assistant Administrator for Operations, National Marine Fisheries Service.

[FR Doc. 03–3758 Filed 2–13–03; 8:45 am]

BILLING CODE 3510–22–S

North Pacific Fishery Management Council

Richard B. Lauber, Chairman
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May 10, 2000

Ms. Penelope Dalton
Assistant Administrator of Fisheries
National Marine Fisheries Service
1315 East West Highway
Silver Spring, MD 20910

Dear Ms. Dalton:

The purpose of this letter is to inform you of certain problems that NPFMC is experiencing with the NMFS status determination criteria and to request clarification on a number of issues. NPFMC will be attempting to improve its current overfishing definitions in the next year, so your timely response will be much appreciated. Because of the technical nature of the problem, our Scientific and Statistical Committee drafted this letter.

NPFMC has continually evolved a TAC-setting process that has resulted in some of the most conservative recommendations found in the world. The quantitative definition of the overfishing level (OFL) as a level that avoids jeopardizing the long-term sustainability of managed resources came into being in the early 1990s as a consequence of a NMFS (D.C.) initiative. Two subsequent revisions (Amendments 44 and 56) were made, as scientists learned that lower fishing mortalities were necessary to achieve conservation principles.

The policy approved by the Council since the early 1990's is a biomass-based policy, wherein (1) fishing mortality is reduced at low population levels below a specified target, (2) separate definitions are given for target (ABC) and limit (OFL) catches, and (3) tiers are set up to accommodate different levels of available information. NPFMC is pleased that all three components are directly addressed in the national Status Determination Criteria. Furthermore, the Council has always set TAC (the actual recommended catch) at or below the ABC level, and thanks to our Observer Program and NMFS in-season management, actual catch (including bycatch) is usually below or near the TAC.

The actions in Amendment 56 to the BSAI and GOA groundfish plans used guidance from the MSFCMA and the 1998 draft NMFS guidelines. The NMFS guidelines call for determination of a minimum stock size threshold (MSST) that would provide rebuilding within a fixed period of 10 years to an MSY biomass level using a maximum fishing mortality threshold (MFMT) that is contained within a harvest control rule. This limiting harvest control rule must have fishing mortality less than or equal to that in the MSY control rule. If a population falls below the MSST, then a rebuilding plan must be completed within one year. The description of a control rule in the guidelines is very similar to the harvest policy that NPFMC uses, so this part of the guidelines has not been a problem. The problem is with the MSST, its technical definition in the guidelines,

its use as an indicator of an "overfished" population, and its triggering of a rebuilding plan as a separate action from the harvest policy. We believe that the current state of science and knowledge allows one to determine when overfishing is occurring, but it is much more difficult to determine when a population or stock is overfished.

The Council policy in Amendments 44 and 56 of using a biomass-based policy that reduces fishing mortality as stocks decrease in size was deliberately selected to provide for automatic rebuilding. In contrast, the NMFS guideline on MSST's requires additional action when stocks are below or approaching the MSST. There is substantial literature to indicate that a biomass-based policy is sufficient to provide for conservation needs. NPFMC experience with the Status Determination process in 1999 has shown that the current biomass-based approach is sufficient to assure that harvest levels provide for sufficient rebuilding within the specified period of 10 years found in the MSFCMA. The added complexity of a threshold policy using MSSTs on top of a biomass-based policy is difficult for the public and even scientists to understand.

NPFMC did not feel obligated to incorporate an MSST in Amendment 56, because the NMFS Guidelines are supposedly suggestions, not statutes. NMFS eventually approved the definitions by agreeing that NPFMC had defined an implicit MSST level and an explicit MSY biomass level (or a proxy) for those tiers with sufficient information. Nevertheless, a current problem is that the same (mostly NMFS) scientists who so ably work within the Council arena on stock assessments must also perform the status determination evaluation using the NMFS guidelines with an explicit MSST that the Council has not accepted. This is creating a confusing, if not untenable, situation for those scientists. In addition, some members of the public, especially those in the environmental community, wish to see further consideration of MSST's, so NPFMC will be reviewing its overfishing definitions in the next year to see if MSST's can be incorporated.

The following issues and related questions have arisen:

1. Currently, NMFS scientists working with NPFMC do not calculate an explicit MSST, but rather a determination is made as to whether the population is above or below MSST. If we explicitly calculate an MSST, is it permissible to alter the definition of MSST in the guidelines? For example, can the requirement that MSST be no lower than Bmsy/2 be dropped?

2. Much time and energy are spent in developing and reviewing a rebuilding plan by scientists, agency personnel, Council members and staff, and the public. If an automatic rebuilding plan with reduced fishing mortality at low population levels is already in place, can the actual FMP amendment process be avoided?

3. The NMFS guidelines require the definition of an MSY control rule, an MFMT rule less than or equal to the MSY control rule (the limit), and an OY control rule less than or equal to the MFMT rule (the target). Does NMFS view the limit control rule as the "real" control on the fishery? Can we be allowed to set the limit to be the same as the target since this is the real limit NPFMC imposes on our fisheries? Consequently, if catch does not exceed this level by some small amount (say 5%), can we then define "overfishing" not to be occurring?

4. The NMFS guidelines require that rebuilding to MSY be evaluated using the MFMT rather than the target OY (or in our case, the ABC) rate. Our scientists have equated the MFMT with the previous OFL fishing mortality, which is akin to MSY fishing mortality. We believe it is more sensible to evaluate rebuilding on the basis of the ABC fishing mortality rate that is actually used in practice (or even the rate based on TAC). If we establish that catch rarely exceeds this ABC level, can we then substitute the target ABC rate for the MFMT limit to accurately reflect what we expect to occur from our real harvest policy?

Finally, we would like to make some suggestions for future revisions to the NMFS guidelines based on our experiences to date:

A. Fish populations fluctuate widely due to a variety of reasons. One of the most important is recruitment fluctuations due to changes in the environment. Setting an MSST that balances conservation concerns with efficacious management is very difficult in these circumstances. The notion of maximum sustained yield for widely fluctuating stocks may not be applicable. We are preparing rebuilding plans for three crab populations for which fishing probably had little or nothing to do with their declines. The overfishing definitions that we constructed follow the intent of the NMFS guidelines but are probably not in accord with the biological reality of the populations. Therefore, new guidelines for widely fluctuating species under changing environmental conditions should be investigated. It is not clear that an MSST is desirable for such populations.

B. Using $B_{MSY}/2$ as the lower bound for the MSST is arbitrary and based on population dynamics concepts that are about 50 years old. The use of such a high value may be draconian in its effect and induce unnecessary management action in light of naturally fluctuating stocks. For most of our populations, there is little or no evidence of reduced recruitment at lower population levels over the range of stock sizes encountered. The biological basis for a unique MSST value has therefore not been established. We believe that an appropriate MSST definition is likely to be population-dependent. The use of $B_{MSY}/2$ as a default rather than a requirement may be a better approach.

C. The use of a fixed 10 year period for evaluating rebuilding conveys the impression that we can predict where the population will be ten years hence, but we all know the uncertainties involved. Furthermore, by concentrating on the population level ten years hence in defining MSST, one may ignore the near-term population trajectory, which is often of greater importance for current management. We do recognize that this requirement comes from the revised Magnuson-Stevens Act and would require Congressional action to change it.

D. Future improvements in management require the understanding of uncertainty in stock projections and the notion of risk. One way to get away from policies that lead to overfishing is to formulate problems in terms of risk, both to the fish and to the fishery. While the guidelines mention this possibility, better technical guidance needs to be developed.

E. As mentioned above, some flexibility to choose the appropriate fishing mortality based on the target level should be given to Councils who have shown the ability to keep fishing mortality under control.

F. There is strong potential for confusion over the term "overfished". Stocks with wide natural swings in abundance will be classified as "overfished" with minor or no contribution from fishing (such as our crab stocks). Consequently, the deserved reputation of the NPFMC for its conservative management practices could be damaged. Under the current definition, there are hundreds of species that were "overfished"; but these are species that went extinct long before humans walked the planet! NMFS should give strong consideration to alternate classification systems such as that described by Musick et al. (1999, Fisheries 24(12): 6-14). The term "overfished" should be reserved for those populations for which fishing can be said to be one of the main factors in a population decline. Nevertheless, we do support the basic concept that stock declines should invoke greater conservatism in management and have designed our harvest policies accordingly.

The Council chairmen have raised similar concerns about rebuilding periods and overfishing definitions at their June, 1999 meeting and in their testimony on MSFCMA reauthorization.

In summary, NPFMC urges that NMFS revise these guidelines to allow consideration of alternative approaches, such as automatic rebuilding programs. In addition, greater flexibility in using these guidelines is sorely needed, and further attention is needed on the issue of establishing prudent MSST's for conservation benefits. One possibility is for NMFS to convene a workshop with SSC representatives and assessment scientists from the different Councils, along with others with experience in harvest policy development. Surely it must be possible to come up with a set of workable guidelines to achieve the laudable goal of rebuilding depleted stocks and at the same time effectively interface with existing Council harvest policies.

If you need further clarification or would like to discuss this further, our SSC contact is Dr. Terry Quinn at the University of Alaska Fairbanks (907-465-5389, Terry.Quinn@uaf.edu).

Sincerely,

Richard M. Lauber

Richard Lauber
Chairman, NPFMC

Western Pacific Regional Fishery Management Council

March 13, 2003

Mr. John H. Dunnigan, Director,
Office of Sustainable Fisheries, Room 13362
1315 East-West Highway,
Silver Spring, MD 20910

Dear Jack:

I am responding to the Federal Register Notice published on February 14, 2003; requesting comments on revisions to the guidelines for the MSFCMA National Standard 1. These comments were compiled by the staff of the Western Pacific Fishery Management Council.

Comments on revisions to the guidelines for National Standard 1

In general, National Standard 1 (NS1), as revised during the re-authorization of the MSFCMA provides fishery managers with good working reference points or bench marks by which the health of fish stocks can be judged, and establishes limits or thresholds, which if exceeded require action by the Council and/or NMFS. NS1 does not need to be fundamentally revised, rather, its operational characteristics need to be modified to provide fishery managers with more flexible options, in the event that a stock is being overfished, or a recovery plan is implemented.

1. **Provide a clearer guidance on actions when overfishing occurs in large highly migratory species fisheries**

Clearer guidance needs to be given on what kind of responses are required from US fisheries that comprise part of a larger basin-scale pelagic fisheries for highly migratory species, such as tunas and billfish. For example the Hawaii longline fishery comprises only 1.4% of the total Pacific-wide catch of bigeye tuna, thus any response by the Hawaii fishery should be weighted by its contribution to the total fishing mortality on the stock, or some relevant factor.

Clearly the solution to overfishing of an highly migratory species (HMS) trans-boundary high-seas pelagic stock is going to be conducted through international management arrangements. But how would a recovery plan be developed for the longline fishery or any of the pelagic fisheries managed by the Council where any action, no matter how conservative, will have little or no effect on stock recovery? NMFS needs to develop policies and guidelines for recovery plans in

the event of overfishing of this kind of stock which reflect the US contribution to total fishing mortality rather than exacting punitive measures on fisheries which have negligible effects on stocks. These might be assessed based on relative fishing mortality, or other constructive measures such as appropriate area closures reductions in harvests of juveniles.

We do not want to create a situation comparable to current fishery management actions stemming from protected species interactions under the Endangered Species Act, where draconian responses are the only management options, regardless of the scale of impact of a fishery on populations.

2. Consider flexible rebuilding time periods

We understand that the 10 year rebuilding schedule specified in the guidelines is predicated on specifying sufficient time for the recovery of an overfished stock. Is this linked to the definition of the Minimum Stock Size Threshold (MSST) as the biomass at which it would take a stock 10 years to increase to biomass at MSY, if fished constantly at the fishing mortality at MSY? If so, this linkage needs to be made more explicit in the guidelines.

In any case, a 10 year rebuilding schedule is a reasonable initial benchmark for many of the stocks managed by this Council. However, fishery managers have to deal with the capricious nature of fish populations and their response to changes in fishing mortality, and to proximate environmental conditions, which may depress or boost fish populations regardless of fishery exploitation. Some stocks with fast growth, high natural mortality rates, and early sexual maturation can undergo orders of magnitude changes in biomass over a very short period of time. Extreme examples are the tropical small pelagic resources around Hawaii such as the big-eye scad, *Selar crumenophthalmus*, whose biomass may decline by as much as 90% , from year to year, and just as quickly rebuild to the same or even higher levels, largely as a response to environmental factors such as rainfall which drive recruitment. Similarly, the biomass of Central-West Pacific skipjack increased by 75% between 1998 and 1999. There must be consideration within the guidelines for situations where biomass levels rebuild at a quicker rate than forecast.

Reduction of the rebuilding schedule could be pegged at some percent increase in biomass in a given time period, if it is clear that a stock is rebuilding faster than anticipated. Clearly, there will need to be safeguards, since biomass increase is only one aspect of recovery. Other factors such as the stock age structure and reproductive potential will need to be factored into reducing a rebuilding schedule. But, the current guidelines seem more concerned with fishery managers setting recovery times longer than 10 years, possibly to buffer economic impacts to fishing communities. Rapid rebuilding of stocks could be just as problematic for Councils since there will be pressure to minimize constraints on the fishery. The guidelines therefore need to consider how to give fishery managers more flexible options when stocks do rebuild more quickly than forecast.

3. Clarify in NS1 that MSY, MSST and MFMT that these are limits not targets

Guidance for National Standard 1needs language which explicitly states that the values calculated for Maximum Sustainable Yield (MSY), Maximum Fishing Mortality Threshold (MFMT) and Minimum Stock Size Threshold (MSST) are not targets, rather they are the upper limits of a range of "safe" fishing. Further, the target biomass and fishing mortality may fluctuate from year to year. Consequently, sufficient buffering capacity should exist within the fishery to maintain fishing mortality and biomass within the "safe" zone, above Bmsy and below Fmsy.

Thank you for the opportunity to comment on proposed revisions to the guidance for National Standard 1.

Sincerely

Kitty Simonds
Executive Director

cc: Regional Fishery Management Councils

BSAI and GOA Plan Team Recommendations for Changes *(in italics)* for the 2002 Research Priorities

A. Critical Assessment Problems

1. Some of our stocks are disproportionately harvested across large areas of the GOA and BSAI due to area closures, other management actions, or fishery behavior. Additional analysis should be undertaken to examine potential effects of disproportional harvesting.

2. More information is needed on "other species." Observer data should be collected and analyzed for individual species. Better estimates of abundance are needed. Lastly, life history data is limited for many species in this complex. *Stock assessments at the assemblage level (sharks, skates, squid, sculpins, and octopus) are planned in the near future.*

3. Rockfish: There is a general need for better assessment data, particularly investigation of stock structure and biological variables.

   a) Supplement triennial trawl survey biomass estimates with estimates of biomass or indices of biomass obtained from alternative survey designs.
   b) Obtain age and length samples from the commercial fishery, especially for Pacific ocean perch, northern rockfish, and dusky rockfish.
   c) Increase capacity for production ageing of rockfish so that age information from surveys and the fishery can be included in stock assessments in a timely manner.

4. Pacific cod: Recent research into aging Pacific cod is being completed and looks promising. The next step would be to evaluate its application to production-aging for Pacific cod.

5. Walleye pollock: There is a continuing need for research on stock structure as it relates to assessment*s*. There is a critical need for ~~a tagging study to focus on~~ stock interaction*s* *studies and pollock recruitment patterns*. We continue to emphasize the need for age-structured assessments of recognized stock units. ~~As the Bering Sea pollock population has declined, the forecasts of future pollock recruitment have undergone greater scrutiny. Research on alternative forecasting methods is needed~~

   The SSC believes that the magnitude of the catch, size and age structure of the EBS stock harvested in the Russian zone in the vicinity of the transboundary area is needed. It may be necessary to consider fishing removals from the Russian zone and their impact on EBS pollock mortality in the estimates of ABC and TAC.

   Assessment of the status of the Gulf of Alaska resource is critically dependent upon results of resource surveys. ~~Beginning next year, t~~*T*hese surveys will be conducted every two years. While this is a positive development, various ways of supplementing the biennial survey data should be evaluated.
   More research should also be conducted on the movement of pollock between the GOA and BSAI and across regions within GOA and BSAI, (e.g., Bogoslof, Donut Hole, PWS, Shelikof, and SE inside).

   More research using acoustic data should be conducted.

6. Crab research: Research should be expanded on handling mortality, stock structure and life history parameters.

7. Age- and length-structured assessments: These assessments integrate several data sources using some weighting scheme. Little research has gone into evaluation of different weighting schemes,

although the weight can have a large effect on the assessment results. Research is needed on which weighting schemes are robust to uncertainties among the different data sources. Age structured assessments depend upon age determination techniques and ongoing age validation is needed.

Correct model specification is critical to stock assessment. Further research is needed on model performance in terms of bias and variability. In particular, computer simulations, sensitivity studies, and retrospective analyses are needed. As models become more complex in terms of parameters, error structure, and data sources, there is a greater need to understand how well they perform.

8. Life history information, e.g., growth and maturity data, is incomplete for a number of stocks. This information is essential for determination of ABC, OFL and preferred fishing mortality rates. Maturity data are lacking for: Pacific cod, Dover sole, other flatfish, sablefish, and many species of rockfish. *An opportunity exists for collecting Pacific cod ovaries and determining maturity during winter surveys scheduled for 2001.* Life history and distributional patterns of Greenland turbot are lacking. To better understand sablefish recruitment variability, additional information on the geographical distributional and movement of juvenile sablefish is needed. *More research should be done on sources of age-specific fish mortality.*

9. Identification of the origin of chum and chinook salmon stocks captured incidentally in the groundfish fisheries is needed. The chum salmon stocks in particular are recognized as a mixture of Asian and North American origin. Resolution of stock origin is important in the consideration of bycatch management.

10. There is need for information about stock structure and movement of walleye pollock, Atka mackerel, Pacific cod, POP, and other rockfish. *Specifically, we need information on temporal and spatial distributions of spawning aggregations of fish (especially Pacific cod).*

11. Further research is needed about management strategies that provide for conservation of aquatic resources. Topics that need attention include: which measure of biomass should be used in biomass-based adjustment of ABC and OFL; what measure of average recruitment to use in $B_{40\%}$; the effect of seasonality in spawning, recruitment, and harvest on optimal harvest rate; adaptive management schemes which are designed to provide understanding of multispecies interactions and spatial population dynamics. One objective is to develop multispecies analysis of stocks.

12. Presentation of uncertainty in stock assessments is often lacking or incomplete. Further research is needed into which methods are most appropriate for capturing uncertainty in the status of populations. The use of Markov Chain-Monte Carlo (MCMC) methods appears to be a promising line of research and its use with AD Model Builder should be further explored.

13. Management measures such as time-area closures and other restrictions are frequently imposed, but rarely rescinded. Studies are needed to evaluate the effectiveness of management measures on conserving populations, achieving management goals and assessing other ecosystem effects.

14. *The Groundfish Teams expressed concern regarding the lack of coverage by trawl survey in both the eastern GOA and in all deepwater strata during 2001 and strongly recommended continued coverage of deeper stations in future surveys.*

B. Stock survey concerns

1. Conservation of aquatic resources in the North Pacific is critically dependent on a consistent time series of trawl, hydroacoustic, and longline surveys. The continuity of these series must remain one of the highest priorities of NMFS and the Council. Data analysis should be expanded to include non-target, non-FMP species.

2. Explore ways for inaugurating or improving surveys to assess rockfish (including nearshore pelagics), pollock, squid and Atka mackerel.

3. Expand bottom trawl surveys in the Gulf of Alaska and Bering Sea to include slope areas that encompass the population range of Greenland turbot, rockfish, thornyheads, and sablefish.

4. Conduct surveys of the Aleutian Islands management area to assist in the assessment of groundfish stocks found in this region.

5. Improve surveys for Bering Sea crab complementary to the existing Bering Sea crab/groundfish survey (e.g. Norton Sound, Pribilof Islands, St. Matthew Island, and Bristol Bay).

6. Direct observation (e.g. submersible and dive surveys) offers unique opportunities to directly examine gear performance, fish behavior in the proximity of gear, gear related habitat impacts, and differences of fish density between trawlable and nontrawlable habitat.

7. There is a continuing need to perform gear calibration and fish observation studies to validate indices of abundance (e.g. fishing longline and trawl gear side-by-side, and fishing different baits on longline gear over the same stations).

8. Little scientific sampling has occurred of seamounts within the EEZ for groundfish, halibut, and crab abundance. Surveys that sample these seamounts may improve estimates of total abundance in the EEZ, particularly for sablefish and rockfish stocks.

9. Data from annual ADF&G crab surveys should be examined and their usefulness for assessing groundfish abundance in near-shore areas should be evaluated. Dialogue between ADF&G and NMFS assessment scientists regarding ways of gaining more useful groundfish data from this survey should be encouraged.

C. Expanded Ecosystem Studies

1. Considerable research is being conducted on the effects of climate on the biology and dynamics of marine populations. Research effort is required to develop methods to incorporate climate variability and its influence on processes such as recruitment and growth into our models of population dynamics.

2. There have been considerable recent advances in using naturally occurring stable isotopes in diverse types of studies. Examples include identifying residence times and areas at various life stages; computing trophic levels and food web dynamics; examining ontogenetic changes and patterns of migration. Studies using these natural markers should be encouraged.

3. ~~Because of the importance of marine mammal and seabird considerations in fisheries management, further studies are needed on interactions among fisheries, marine mammals, and seabird populations. In particular relationships among oceanographic conditions and animal condition and health should be explored. Research should be done on sources of age-specific fish mortality.~~

3. *Explore the utility of placing trained marine mammal/seabird observers onboard vessels conducting fishery surveys. Such observations may contribute to abundance estimates, or to provide indices of abundance and associations with oceanography and prey distributions. In particular, relationships among oceanographic conditions and animal condition and health should be explored.*
   a) *More research should be collected by placing trained marine mammal/seabird biologists on line transect surveys to begin an index of abundance for birds.*
   b) *Encourage data exchanges between USFWS and NMFS RACE and NMML.*

4. Effort is needed on status of stocks and distribution of forage fishes, such as capelin, eulachon, and sand lance. Forage fish are an important part of the ecosystem , yet little is known about these stocks. The Lowell-Wakefield Symposium (October 1996) presented current research on forage fishes.

5. Studies of the effects of harvesting and processing activities on the ecosystem and habitat should be instituted. One example would be a study contrasting species diversity and abundance in the red king crab savings area with that in adjacent regions.

6. Trophic dynamics research should be undertaken on the relationships among critical species, e.g., Pacific cod and its prey (including shrimp and crabs). The feasibility of constructing multispecies models using ongoing collection of gut contents data should be investigated.

7. Groups of species in the rockfish and flatfish families are now managed as "species complexes." Research should be expanded on the question of biological linkages among the components of "species complexes" that justify this management approach. Further, are there other, unidentified groups of species that are ecologically related and could be managed as a unit?

8. Studies are needed to identify essential habitat for groundfish and forage fish species in the Gulf of Alaska and Bering Sea. This identification is required by the MSFCMA and would benefit from field studies conducted across a matrix of spatial, temporal, and life history stages. Mapping of nearshore and shelf habitat should be continued for FMP species.

9. Expand studies of distribution, abundance, and productivity of seabird populations and ensure that data are collected in ways that provide for rigorous analyses of seabird/marine mammal/oceanographic/fisheries interactions. ~~The majority of~~ Historic data on seabirds in Alaska was collected during the 1970s (through OCSEAP); but the quantity of data collected afterwards has been insufficient to adequately examine trends in these interactions.

10. *Historic (i.e., OCSEAP) data existing in the USFWS Pelagic Database needs be reformated to update and make the data accessible, to enable analysis on seabird/fishery interactions.*

11. *More recent (1990's - present) data needs be consolidated and added to the pelagic database.*

12. *Seabird diet needs to be described for more areas and species, including winter diet needs of seabirds. Existing and historic diet data needs to be consolidated and put into a format accessible and appropriate for examination of long-term trends. Very little is known about winter diets of birds.*

13. Multivariate statistical analysis of the time series of annual survey data may identify which species regularly occur in assemblages. Mapping these assemblages through space and time may reveal changes in the distribution and abundance of the species of the Eastern Bering Sea. These mappings and trajectories may be applicable to adaptive management approaches suggested for exploring ecosystem concerns. Although related analyses were started by NMFS in the late

1970's, they have not been conducted in recent years. Recent advances in spatial statistics may prove fruitful tools for re-examining these existing data.

14. Uncertainty about the relationship between the Steller sea lion population and groundfish fisheries has taken an elevated significance. With this uncertainty as to the extent of factors affecting Steller sea lions, it is critically important to investigate the effects of mitigation measures on the sea lions, the fisheries, and the ecosystem. The monitoring must be based on an experimental design that provides information about the interaction of fisheries and Steller sea lions. Five questions are central to future work:

15. *What is the distribution of fish in relation to areas used for fishing, and what are the seasonal changes?*
    a) *What is the distribution of fish in fishing areas before and after fishing?*
    b) *How do Steller sea lions use pollock in relations to pollock distributions?*
    c) *How does the Steller sea lion's pollock feeding habits influence sea lion population dynamics?*
    (d) *Does the fishery effect Steller sea lions in other ways (e.g., behavioral disturbance)?*
    (e) *How much is needed per SSL compared to what is there seasonally and geographically – demand vs. availability, to address localized depletion?*

16. *More research should be conducted to estimate jellyfish abundance trends because it may be an ecosystem indicator ~~and acts~~ (it is a habitat for pollock).*

17. *There is an apparent increase of a parasite occurrence in some flatfish stocks (flathead sole and Greenland turbot) in the Bering Sea. This may signal changes in the ecosystem and has important consequences for the fishery. Research on this should be pursued.*

18. *Killer whale depredation of sablefish catches has been a problem in the Bering Sea since the beginning of the survey. Additional information on the impacts of killer whale depredation on sablefish in the ecosystem and in the sablefish survey should be assessed.*

D. Social and economic research

There is a critical need for the development and continued maintenance of basic social and economic information databases on the fisheries and fisheries dependent communities of GOA and BS/AI. This information is required for establishing a baseline to be used in the evaluation of the impacts of alternative management measures.

1. There is a need to develop a cross section-time series of data on:
    a) Ex-vessel and wholesale prices (information is needed on actual transactions and sources of variability).
    b) Inventories and exports (greater detail on product form, volume, and transactions prices).
    c) Cost of variable inputs to fishing
    d) Patterns of ownership in fishing and processing operations (concentration, vertical integration, foreign participation).
    e) Employment and earnings for crew and skippers
    f) Patterns of employment/unemployment, earnings, transfer payments in fishery dependent communities, and
    g) The location where goods and services are purchased.

2. There is a need for economic analyses of:

    a) The demand for fisheries products (exvessel, wholesale, international, and retail markets)
    b) Production functions for catch and processing

c) Regional models of economic activity in fishery dependent communities,
d) An assessment of the cumulative efficiency and equity consequences of management actions that apply time/area closures
e) An assessment of the consequences of the halibut/sablefish IFQ program (changes in product markets, characteristics of quota share markets, changes in distribution of ownership, changes in crew compensation, etc.)
f) Estimates of the net economic benefits of recreation and subsistence harvests, and,
g) Improved representation of fleet behavioral response to alternative fishing opportunities to provide better prediction of how fishing effort will shift in response to time/area closures.

3. Research pertinent to assessment of the social impacts of actions contemplated by the Council include:

a) Fishery/Community Linkages: Field research aimed at capturing the full array of linkages between fisheries and social and economic life in fishery dependent communities.
b) Social Assessments: Selected community and industry assessments should be conducted to establish baseline conditions underlying social problems identified by the Council and the Advisory Panel. As appropriate, these projects can be extended to generate time series information.
c) Social Impacts: Social impact and policy research should be conducted regarding the identification and potential effects of alternative management actions.
d) Develop better methods for determining the social costs and benefits of management actions (e.g. through the use of non-market valuation techniques).

E. Bycatch problems

1. Research on gear modification and other methods for reducing bycatch should be expanded.

2. A better quantification of discard mortality rates is needed, especially for ~~halibut and~~ crab.

3. Data on size/age and sex of crabs taken as bycatch are needed to assess impacts.

4. Comprehensive evaluations are needed of single and multiple time/area closures and other bycatch management measures.

5. Develop better methods for assessing the social costs of bycatch.

6. Identify sources of variability in actual and estimated bycatch rates.

7. Collect bycatch information in the directed halibut fisheries using observer coverage. Current logbook information is inadequate to quantify this bycatch. *Research efforts should also include development of video monitoring options.*

F. Fishery Monitoring

1. Inseason management and stock assessment are critically dependent on catch estimates. There is a need to conduct ongoing analyses of the accuracy and precision of catch estimates in all fisheries. An analysis of the utility of fishery logbook information should be conducted. In particular, determine if it is possible to gain insight into fleet performance from such information. Examine feasibility for developing a representative CPUE index and determine if it is proportional to stock size

2. Evaluate sampling procedures used by observers and various catch estimation procedures. Recent analyses have been conducted on efficient methods of collecting representative biological data

from target species. Similar studies should be conducted on the collection of prohibited species biological data.

3. Development of catch and bycatch sampling procedures for individual vessel accountability programs.

AGENDA D-1(f)
APRIL 2003
Supplemental

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

The Commons at Rivergate
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(813) 228-2815 • FAX (813) 225-7015
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March 27, 2003

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Mr. John H. Dunnigan
Director
Office of Sustainable Fisheries
Room 13362
1315 East-West Highway
Silver Spring, Maryland 20910

Dear Mr. Jack Dunnigan:

We are responding to the Federal Register notice published on February 14, 2003, requesting comments on revisions of the guidelines for the Magnuson-Stevens Act (MSA) National Standard 1. Our Administrative Policy Committee and Council reviewed the guidelines and offer the following comments.

First, the Council supports NMFS consideration of revisions to the guidelines for National Standard 1 as long as the revisions do not weaken the conservation goals of the Sustainable Fisheries Act. Our experience in the Gulf region leads us to consider revisions of:

1. Definition and use of MSST;
2. Allowing Councils to combine assessments and status determination criteria for assemblages of minor, data-poor stocks; and
3. Providing guidance to Councils for situations where new stock assessments require adjustments to established rebuilding plans.

In addition, the Council has concerns regarding the exceptions to overfishing allowed in the guidelines under 50 CFR 600.310 (d) (6).

Definition of Use of MSST

In the Southeast, we have had significant problems in computing B_{MSY} and the MSST in terms of biomass. In our SFA Generic Amendment we were unable to provide reliable biomass estimates for almost all of our finfish stocks. Because of that, we provided in the amendment that the overfished threshold or MSST would be incorporated into the FMPs as they were developed for each stock by NMFS. We, jointly with NMFS have made relatively good progress developing reliable biomass-based estimates of MSST for most major stocks. However, that exercise has demonstrated that we are unlikely to develop reliable MSST estimates for the minor stocks in the near future. The current language of the guidelines for MSST provide that a reasonable proxy would be acceptable for use as MSST. However, the guidelines fall far short of defining or providing advice on what would be a reasonable proxy. These sections on proxies need to be expanded based on current scientific information. The last sentence of the Guidelines for MSST is as follows: "Should the actual size of the stock or stock complex in a given year fall below this threshold, the stock or stock complex is considered overfished. However, the guidelines for MSST do not even address how MSST for a

stock complex would be determined. While the Council supports having a biomass-based threshold for overfishing we have problems computing reliable estimates, or any estimates at all for some stocks. This section needs to be revised to provide a broader range of alternatives for specifying an overfished threshold.

Allowing Councils to Combine Assessments and Status Determination Criteria for Assemblages of Minor, Data-Poor Stocks

The need for this type of flexibility is set forth in part above, i.e., the available data do not allow computation of a reliable estimate of MSST. However, for many minor stocks, this same difficulty applies to estimates of the MFMT, MSY, OY and other parameters. Therefore, as pointed out above, guidance is needed for addressing those parameters for stock complexes, as well as for assemblages of minor, data-poor stocks. This becomes especially important as we move toward ecosystem management which of course involves managing stock complexes as a whole. It also requires recognition that the stocks within a complex will usually vary in abundance year-by-year but should result in an overall biomass that is fairly stable, so long as the predator/prey structure remains stable.

Providing Guidance to Councils for Situations Where New Stock Assessments Require an Adjustment of Rebuilding Plans

In a large sense, the guidelines provide the administration's interpretation of the definitions and procedures necessary for action to arrest overfishing and recovery of overfished stocks as set forth in MSA Section 304 (e) for rebuilding overfished fisheries. The only reference to this issue is that paragraph (7) provides that the Secretary will monitor programs for rebuilding stocks every two years and if progress is inadequate, the Council is immediately notified to make revisions to achieve adequate progress. The guidelines do not provide discussion of the action needed to adjust the rebuilding plan under these circumstances. Since the analysts that complete or provide peer-review of stock assessments are continually identifying data needed to improve the reliability of the assessment, it is not unusual for the assessment of the status of the stocks to change as better data become available. An example of a very significant change in status is the two most recent stock assessments for red grouper. The first showed the stock to be overfished and subject to overfishing requiring a 45% reduction in landings; whereas the second showed the stock was not overfished, but was subject to overfishing which required a reduction of landings by about 9-10%. Therefore, we conclude that additional guidance is needed for adjusting the rebuilding plans as expeditiously as possible.

Finally, the Council did express some concern over the provision of the guidelines under 50 CFR 610 (d) (6) which provides that harvesting one species of a mixed-stock complex at its optimum yield may result in overfishing another stock component in the complex. The Councils may permit this under certain criteria. The Council recognizes that when we begin ecosystem management, the abundance

levels (or biomass) of the stocks may vary considerably from year to year, but does not believe that no action should be taken to arrest overfishing or begin rebuilding an overfished stock.

For stocks that anecdotal or other information indicated that they are overfished, we have prohibited harvest or possession of those stocks. Goliath grouper is a prime example, we prohibited harvest and possession in 1990 and currently the stock shows good evidence that it is being rebuilt.

We thank you for the opportunity to comment on these important issues.

Best personal regards.

Sincerely,

Jim Fensom
Chairman

JF:WES:plk

c: Gulf Council
Regional Council Executive Directors
Staff

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Brent C. Paine
Executive Director

Steve E. Hughes
Technical Director

John F. Gruver
Intercoop Manager

UNITED CATCHER BOATS
UCB
Washington · Oregon · California · Alaska

AGENDA D-1(d)
APRIL 2003

Dr. James Balsiger
Regional Administrator
NMFS- F/AKR
P.O. Box 21668
Juneau, AK 99802
March 14, 2003

RE: EFP application to test a salmon excluder device for the BS/AI pollock fishery

Dear Jim:

We have prepared for your consideration an application for an exempted fishing permit (EFP) to test a salmon excluder device for pollock trawls. The proposed EFP work will be accomplished in direct collaboration with Dr. Craig Rose in NMFS' RACE Division and much of technical aspects of the EFP work have been developed under his direction and assistance. It is my understanding that the AFSC is currently satisfied with the scientific merits of the proposed work subject to modifications addressing the issues brought out in their internal scientific review. We anticipate being able to address all of their review comments over the next few days so that the Council and its advisory bodies will have the opportunity to review the project at their upcoming April meeting.

The proposed field work for the EFP will be done in two stages, one in September of this year focusing on chum salmon and the second next spring to test the performance of an adapted version of the device for Chinook salmon exclusion. The reason we have decided to combine the chum and Chinook salmon portions of the field test into a single EFP application and RFP process for vessel selection was that they are, in reality, sequential stages of a single project. We also think this approach will facilitate the review process and reduce duplication for all parties. Under this plan, final approval and issuance of the exempted fishing permit would have to be accomplished in time for early September of 2003. This would allow the first stage of field testing to occur in mid-September as set out in the scheduling of the EFP work (see supporting document).

We are seeking NPFMC review of the permit application at the April NPFMC meeting because leaving that step until June would compress the overall time for NMFS' review and permit approval process. Council consideration of the application in April would avoid the potential complication in our work schedule that would be created by a June Council review because we anticipate being fully engaged in physical construction of excluder devices for a beta test of

design concepts under two NMFS research charters in June. The project also utilizes a "request for proposals" process, whereby applications from interested vessel owners will be solicited and reviewed in order to select a single vessel to perform both field trials. As with past EFP projects, once Council approval is obtained, we can prepare and distribute draft RFP materials for the consideration of interested vessel owners subject to NMFS' final approval and issuance of the exempted permit.

The attached support document explains the need for a new approach to salmon bycatch reduction and avoidance, the role an EFP plays in the overall development of that new approach, and provides a thorough explanation of the experimental design and assignment of responsibilities for the different stages of EFP work. As you will see, the supporting documentation was developed for a general audience, one obviously less familiar with the salmon bycatch issue for the groundfish fishery off Alaska. Those familiar with evolution of fishery management of salmon bycatch and the industry efforts to control salmon under the prohibited species caps can simply skip to the sections on addressing the purpose and need, assignment of EFP responsibilities, experimental design, and calculation of sample size and limits for the EFP.

We believe the EFP application merits approval because it is a crucial step in the development of a better and more effective means of reducing salmon bycatch and because the EFP experimental design has a high probability of determining the actual effectiveness of such a bycatch reduction device. Through this work, industry is expected to gain a great deal of information on the performance and design considerations of a salmon excluder device that would be practical for the pollock fishery. Over the last six months, the pollock industry has experienced a great deal of difficulty maintaining the fishery below the salmon bycatch caps. With this work to develop an effective excluder, it is hoped that some much needed relief from the impacts of current bycatch cap constraints on chum and Chinook salmon will be achieved.

In accordance with regulations governing EFP applications, we provide below the baseline information about our EFP application in the categories listed in the regulations. For more detailed information on the purpose and objectives of the EFP, the experimental design, derivation of the catch amounts needed for experiment, and details on the milestones and assignment of responsibilities of parties, please refer to the attached support document. Thanks in advance for considering our application.

Sincerely,

John R. Gauvin
Principal Investigator

Brent Paine
Executive Director

An Exempted Fishing Permit Application To Test A Salmon Excluder Device For Pollock Trawls
March 2003

Date of Application: March 13, 2003
Name, mailing address, and phone number of applicant:

Principal Investigator:
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Co-Investigators and Pollock Industry Coordinators:
Brent Paine and John Gruver
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4005 20th Avenue West, Suite 116
Seattle, WA 98199

Purpose and Goals of the EFP: The purpose of this EFP is to test the effectiveness of a salmon excluder device for pollock trawls. The goal is to develop a device for pollock trawls that reduces salmon bycatch without significantly lowering catch rates of pollock. The EFP will produce a report for public dissemination describing the devices tested in each phase of the work (chum and Chinook salmon) and the performance of the devices in the tests. Because salmon bycatch currently constrains the pollock fishery and because the fishery is managed under a system that imparts individual accountability and bycatch management incentives, widespread voluntary adoption of the device can be expected if the device is successful.

Justification for the EFP: Mandates to reduce bycatch and bycatch mortality are set out in the Magnuson-Stevens Act. Current tools to avoid salmon bycatch are costly and at times less than effective. Salmon bycatch caps are currently very restrictive and in the case of the cap for Chinook salmon, further cap reductions are scheduled to take effect in the near future. The industry is very interested in the development of an effective salmon excluder and has committed significant resources to this project and associated development steps that have led up to this EFP test.

Names of participating vessels, copies of vessel Coast Guard documents, names of vessel masters: The principal investigator will notify the AKR Regional Administrator in writing of the name of the selected vessel including its associated document once the RFP process is completed. The principal investigator will also arrange to notify all relevant enforcement agencies of the vessel documentation and dates and area of operations for the EFP work. This will include ADF&G, NMFS, and the US Coast Guard.

Target and incidental species harvested: As the Council and NMFS have approved for past EFP experiments dedicated to bycatch reduction, groundfish and prohibited species taken during the experiment should not be counted against the annual total allowable catch and prohibited species bycatch caps. The taking of salmon during the experiment is crucial for determination of the effectiveness of the excluder device. The additional

amount of pollock taken in the EFP is not expected to cause the Bering Sea pollock fishery to exceed its acceptable biological catch. Pollock taken during the testing will be sold to help offset the costs to the vessel operations during the experimental work.

Groundfish: The estimated total harvest of allocated groundfish species including both the chum salmon stage of the EFP work (970 MT of pollock in fall of 2003) and the Chinook salmon stage (1,300 MT in spring of 2004) is 2,270 MT of groundfish. Approximately 98% of this is expected to be pollock and 2% is expected to be other groundfish species such as Pacific cod and flatfish. Retention standards for the EFP work will be the same as those for the directed fishery for pollock.

Pacific salmon: The experimental design calls for a minimum sample size of 200 chum salmon for the first stage of EFP work and 30 Chinook salmon for the Chinook salmon excluder test next spring. For the chum salmon excluder work, sample size is designed to have sufficient statistical power to have an 80% probability of detecting a 10% difference in proportion of effect (performance of the excluder) from the underlying proportion of 0.5 with 95% statistical confidence (alpha =0.05), (please see supporting document). For the Chinook salmon excluder portion of the EFP work, a sample size of 30 Chinook salmon is expected to provide an 80% probability of detecting a 25% difference from the underlying proportion of 0.50 (with alpha set at 0.05).

The determination of sample size for each species of salmon for each excluder trial is based on a target amount of pollock catch which, under the assumptions of the EFP work, is expected to have a reasonably high probability of generating the desired sample sizes for the two stages of the EFP. To reduce the risk of "under sampling" if salmon abundance turns out to be lower than it was in the data for the period used to develop sample size calculations, salmon bycatch data for sample size calculations were treated in a conservative fashion whereby only below average bycatch rates for the period covered by the data were used for sample size calculations. This "risk averse" treatment was adopted to increase the probability that the EFP achieves its sampling goals if the EFP fishery work happens to encounter "below average" salmon abundance conditions in areas where pollock fishing occurs.

An "upper end" estimate for salmon mortality associated with this project is 2,183 chum salmon and 217 Chinook salmon. This estimate was made based on the unlikely assumption that each stage of the experiment encountered conditions similar to the highest weekly bycatch rate (respectively) for the vessel with the highest respective salmon bycatch rates in the data used to develop the sample size calculations (see supporting document).

This application specifically requests that salmon catch not be a catch limitation for this EFP. The success of the EFP work depends on our ability to target areas with concentrations of these salmon for the benefit of the experimental work. Further, catching additional salmon will increase the ability of the EFP work to determine the effectiveness of the excluder device. Even if the upper bound estimates of salmon catch numbers for the EFP work were attained, these are relatively small numbers of mostly juvenile salmon compared to respective biomasses. We believe that the merits of the research in reducing salmon bycatch outweigh any potential effects such salmon removals associated with the EFP work might have.

Further, we are specifically requesting exemption from salmon bycatch management regulations establishing fishing area closures for the pollock and groundfish fisheries. The regulations we are seeking exemption from are the salmon bycatch management rules that either close areas annually at a certain point in time (seasonally) or those that may close areas upon attainment of a PSC cap (trigger) number of salmon. This exemption is also proposed because the success of the EFP work depends on our ability to conduct the experiment in areas where salmon are concentrated. A restriction on our ability to conduct the experimental fishing in salmon "savings" areas would be expected to reduce the potential success of the EFP test.

Disposition of allocated groundfish species caught in the EFP: The vessel selected for participation in the experiment can legally retain all groundfish catches in accordance to the directed fishing standards for the BS/AI pollock fishery that are applicable to the regular pollock fishery as set out in the American Fisheries Act and other applicable law. Salmon caught in the EFP work will be retained for donation to food banks according to the regulations governing this practice for the regular pollock fishery.

On-board sampling and data collection: Variables of primary interest for sampling during the experiment are the:

1. Number of salmon in recapture net and codend (per tow)
2. Quantity of groundfish in the recapture device and codend (per tow)
3. Length frequency of salmon in recapture device and codend (per tow)
4. Length frequency of approximately 100 pollock from codend and recapture device (each) per tow

To adequately collect data for the variables of interest for the EFP work, two NMFS-certified at-sea observers may be required for the at-sea EFP work. On deck facilities of certain catcher vessels may preclude complete removal of salmon from the catch in the main codend. Such vessels may be considered for the EFP if they have multiple RSW tanks that allow separation of the catches from each haul, which would then be re-screened during offloading of the catch at processing facilities. To allow consideration of alternative sorting and sampling proposals for these vessels, proposals for one at-sea observer and one additional observer stationed at the processing plant may be considered.

Expected impacts on marine mammals and endangered species: None. In the event that any additional sea lion protection area restrictions become effective for the pollock fishery within sea lion designated critical habitat, this application specifically request that NMFS do "everything in its power" to exempt this EFP work from those potential additional area restrictions. The relatively small amount of pollock catch associated with the EFP work could not expected to have any measurable effect on sea lions. Restrictions on conducting the EFP work in sea lion critical habitat, however, could dramatically affect the ability to find concentrations of salmon, which is critical to the success of the project.

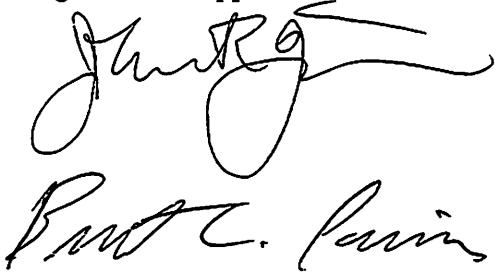
Type and size of vessels and gear: Any vessel capable of meeting the requirements of the EFP work (as described in the RFP materials) can be proposed for the EFP. It is noted, however, that the EFP field work is specifically designed for a vessel platform similar to catcher vessels in the Alaska pollock fishery currently delivering either to a shoreside

processor or mothership. Trawl gear will be normal pollock trawls that comply with regulations governing pelagic trawls required for the BS/AI pollock fishery. These trawls will be modified with salmon excluder devices and recapture devices.

Approximate time and place for exempted fishing under EFP: The chum salmon field test portion of the EFP is expected to last approximately 12-15 consecutive days starting in mid-September of 2003 (see attached document for an explanation of the anticipated timing). The Chinook salmon excluder test is expected to start sometime from January 20th through the end of March in 2004. The expected duration of the EFP test of the Chinook salmon excluder is also 12-15 days. The location for the test will be the common areas for catcher vessels to fish for pollock in the Bering Sea at those times of the year. The single exception is the specific request for exception from regulations establishing salmon savings areas, either those pre-established closure areas or those closed if bycatch caps are attained (see above).

Data analysis and preliminary and final reports: Analysis will primarily focus on the estimation of the proportions of pollock and salmon excluded from the catch through the device. The experiment is designed to estimate these values for the combination of all tows, representing the value of the device in ordinary fishery conditions. Variability of escape rates between tows will be examined for indications of conditions affecting excluder performance. Combined size composition data will be tested for differences between retained and escaping fish. Results and analyses will be compiled into preliminary and final reports and presentations that will be made available to managers, trawlers, scientists and the interested public.

Signature of Applicants:



Support Document for the Application for an Exempted Fishing Permit to Test a Salmon Excluder Device for Pollock Trawls

Introduction

Chinook salmon *Oncorhynchus tshawytscha* and chum salmon *O. keta* are caught incidentally in Alaska groundfish fisheries, primarily in the walleye pollock *Theragra chalcogramma* trawl fishery. From 1990-2002, an average of 37,795 Chinook salmon and 69,680 other salmon species (> 95% are chum salmon) were incidentally caught annually in Bering Sea and Aleutian Islands groundfish trawl fisheries (Table 1). Bycatch is primarily juvenile salmon that are one or two years away from returning to the river of origin as adults.

BYCATCH OF PACIFIC SALMON IN ALASKA GROUNFISH TRAWL FISHERIES

Bering Sea and Aleutian Islands Area

	Numbers of Fish	
Year	Chinook	Chum
1990	14,085	16,202
1991	48,873	29,706
1992	41,955	40,090
1993	45,964	242,895
1994	44,380	95,978
1995	23,079	20,901
1996	63,205	77,771
1997	50,218	67,349
1998	58,966	69,237
1999	14,586	47,204
2000	8,219	59,306
2001	40,303	60,460
2002	37,507	78,739
Average	37,795	69,680

Source: NMFS Alaska Region website

Pacific salmon support large commercial, recreational, and subsistence fisheries throughout Alaska. Over the last four years, Chinook and chum salmon runs in western Alaska have been at relatively low levels compared to runs observed over the last 20 years. Although these reduced salmon runs appear to be attributable to changes in ocean conditions (Hare and Francis 1995; Kruse 1998), considerable public concern has been raised as to the effect of low salmon returns on fishery dependent communities in western Alaska. Responding to the crisis in the salmon industry, the Governor of Alaska has declared a state emergency on several occasions over the last four years. In response to the Governor's concerns, the North Pacific Fishery Management Council (NPFMC) has reviewed on several occasions the bycatch management measures in place to reduce

salmon bycatch to the extent practicable, as required by the Sustainable Fisheries Act of 1996.

In 2002, the North Pacific Fishery Management Council reviewed a retrospective analysis of salmon bycatch trends and estimated effects of Alaska groundfish trawl fisheries on salmon returns in Alaska (Witherell et al 2002). This evaluation of the possible bycatch effects concluded that bycatch in groundfish fisheries reduced western Alaska Chinook salmon runs by less than 2.7%. Estimated effects were derived by evaluating numbers of bycaught salmon at age and factoring effects of natural mortality (that would have been expected to occur). Salmon taken incidentally in these fisheries are known to originate from Alaska and Pacific northwest runs, as well as Asia and Russia. While this is clearly a small percentage effect on fish bound for Alaskan river systems, the effect is nonetheless considered to be slightly greater than the estimated effect of Alaskan groundfish fisheries on other prohibited species in federal waters fisheries off Alaska, such species as Pacific halibut and several species of king and tanner crabs (Witherell et al. 2002)

Existing Fishery Management Bycatch Reduction Measures

Salmon are listed as a prohibited species in the groundfish fishery management plans, meaning that they cannot be retained and sold. Regulations implemented in 1994 prohibited the discard of salmon taken as bycatch in BSAI groundfish trawl fisheries until the number of salmon has been determined by a NMFS certified observer. Subsequent regulations allowed for voluntary retention and processing of salmon for donation to foodbanks.

Bycatch of Chinook salmon in Alaska groundfish fisheries is generally higher in the winter and chum salmon bycatch is higher in the summer although this trend is not without exceptions. Based on this seasonal pattern, the North Pacific Fishery Management Council has adopted extensive seasonal cap and closure measures to control bycatch of salmon in trawl fisheries (Witherell and Pautzke 1997). Regulations establish closures for several areas with historically high bycatch of salmon if the seasonal cap (number) of salmon is taken as bycatch. Beginning in 1994, the Chum Salmon Savings Area has been closed to all trawling from August 1 through August 31. Additionally, the area re-closes after August 31 if a bycatch threshold limit of 42,000 chum salmon is caught incidentally in the southeastern part of the Bering Sea between August 15 to October 14.

From 1996 through 1999, regulations were in place to prohibit trawling in the Chinook Salmon Savings Areas through April 15 if and when a bycatch limit of 48,000 Chinook salmon was attained in the BSAI trawl fisheries. More than 48,000 Chinook salmon were taken as bycatch annually from 1996 through 1998, but closures were not triggered because bycatch limits were not exceeded before April 15.

In 2000, new regulations to reduce Chinook salmon bycatch in BSAI trawl fisheries were implemented (NPFMC 1999). The regulations incrementally reduced the bycatch limit for the pollock fishery from 48,000 to 29,000 Chinook salmon over a 4-year period and

implemented year-round accounting of Chinook salmon bycatch in the pollock fishery. Additionally, the boundaries of the Chinook Salmon Savings Areas were modified. Under these modifications, in the event the limit is triggered before April 15, the Chinook Salmon Savings Area closes immediately. The closure would be removed on April 16, but would be reinitiated September 1 and continue through the end of the year. If the limit were reached after April 15, but before September 1, then the areas would close on September 1. If the limit were reached after September 1, the areas would close immediately through the end of the year. The bycatch limit for the 2002 BSAI walleye pollock fisheries was 33,000 Chinook salmon.

In February 2002, the North Pacific Council initiated a process to consider salmon bycatch control measures for GOA groundfish trawl fisheries. These measures may include bycatch limits that when attained, would trigger closures in areas with the historically highest bycatch rates.

Fishing Industry Initiatives To Control And Reduce Salmon Bycatch In Groundfish Fisheries

Over the last ten years, the pollock industry has developed voluntary controls on bycatch of salmon and initiatives to collect and analyze samples for genetic analysis to improve information on country of origin. Efforts have also been undertaken to evaluate temperature and other environmental data collected routinely by industry for information on how these variables are associated with salmon bycatch.

Starting in the early 1990s, several programs employing location-specific bycatch avoidance data exchanges between fishermen were implemented by the pollock industry. These programs utilize fishery observer data on a fast-turn-around basis so fishermen can more effectively avoid bycatch "hotspot" locations. These early efforts were formally adopted into agreements between pollock fishing cooperatives that were established through the American Fisheries Act of 1998. The individual incentives and accountability through internal private contracts within pollock fishing cooperatives established under the American Fisheries Act have increased the effectiveness of industry bycatch management systems.

Industry efforts to control and reduce salmon bycatch have resulted in tangible improvements in fishery performance. The nature of the bycatch problem with salmon, however, is exceedingly complex and inherently difficult due to the unpredictable nature of salmon locations and movements. From a practical perspective, the pollock industry believes that one of the biggest problems with salmon avoidance is that hotspots are often transitory. By the time such concentrations are identified, a relatively large number of salmon may have already been taken and salmon may have already moved to other locations. Overall, hotspot avoidance and other approaches have provided some success but these efforts can only achieve success to the degree that salmon movements (and hence bycatch) follow some sort of predictable pattern.

The challenges of salmon bycatch avoidance itself, particularly in the context of the restrictive bycatch management measures in place in the Bering Sea/ Aleutian Islands

groundfish management plan create a significant problem for the pollock industry. This situation will undoubtedly be even more acute if salmon populations increase or environmental conditions change in the future to increase the overlap of Chinook and chum salmon feeding and migration routes with fishing grounds used for pollock fishing. The potential effects of existing management controls on salmon bycatch can be seen in the fact that the analysis prepared in support of the decision to reduce the Chinook bycatch cap determined that had the cap of 36,000 salmon (an amount far in excess of what the cap will be once the phased-in reduction to 29,000 is complete) been in place during the 1994-1997 period, such a cap would have been triggered three of the four years for which data were available. This would have been expected to reduce the pollock catch in those years by 7-28% (NPFMC 1999).

One further complication is that salmon avoidance is not the only constraint facing the pollock industry. The decision of where to fish is affected by other constraints. An important constraint on where pollock vessels might fish in order to avoid salmon are regulations governing pollock removals and fishing locations so as to minimize potential competition with Steller sea lions. To avoid harvesting more than the allowable amount of pollock in sea lion critical habitat, fishermen often must select fishing areas than are outside of sea lion critical habitat even when salmon bycatch was relatively low in those sea lion protection zones. In some cases, this tradeoff can mean higher incidental catch rates of salmon.

The Need For An Alternative Approach To Salmon Bycatch Reduction

Over the years since seasonal bycatch caps have been in place, pollock fishermen have incurred substantial costs to control salmon bycatch. The industry believes that the cost of these salmon avoidance measures is high under the current set of seasonal bycatch caps. Costs could increase further as the phased-in reduction of Chinook salmon bycatch are implemented or as a result of potential additional measures to protect sea lions.

Costs associated with salmon avoidance go beyond the simple time and fuel costs incurred by moving vessels to alternative fishing areas. At times, pollock catch rate and/or the abundance of fish in optimal size ranges is highest in areas where salmon are concentrated. The costs of not being able to conduct fishing in those areas often exceed the costs of moving to alternative fishing areas according to industry sources.

This discussion of costs of existing methods to control salmon bycatch illustrates the potential value of a bycatch reduction device (BRD) to the pollock fishing industry. If a BRD is successful at reducing salmon bycatch with relatively low escapement of pollock, such a device would allow pollock fishermen to avoid or reduce the costs of moving and searching for an alternate fishing location or sacrificing good fishing conditions. An effective BRD might not only reduce such costs but could actually increase product quality and per unit revenues in conditions where the most valuable pollock are located in areas where salmon are relatively concentrated. If the performance of the device proved to be exceptional, then the effects of the salmon bycatch control measures, both the fishery management controls and the industry controls, might be avoided entirely.

Benefits to consumers and the country overall from the pollock fishery could also increase under the expectation that the benefits of efficiency gains and increased product quality would accrue to consumers and the nation. Additionally, although the estimated environmental effect of salmon bycatch on salmon runs in Alaska are thought to be minimal, the reduction in these effects would create some expected benefits for commercial and recreational fishermen, Alaskan natives and tribal values associated with salmon, and salmon management and conservation goals. In years where salmon returns are relatively low, the reduction in bycatch effects on salmon runs, however minimal those effects might be, would be avoided to the timely benefit of those runs.

These environmental benefits are based on the assumption of minimal injury to salmon utilizing the escapement device. Any evaluation of the performance of salmon bycatch reduction device and its costs and benefits would clearly need to explicitly evaluate the question of long term survival in order to assess actual benefit/cost tradeoffs. The expectation of benefits from a BRD also assumes that changes in fishing behavior as a result of widespread the use of the device would not increase some other potential environmental costs associated with the fishery.

Purpose And Need For An Experimental Fishing Permit To Develop A Salmon BRD Device And Evaluate Its Performance

Trawl skippers have informally developed and tested excluder devices for bottom trawls for many years. To the best of our knowledge, however, little or no informal effort has been focused on designing a salmon excluder device for pelagic trawls used in the BS/AI pollock fishery. One explanation for this is that up until recently, the industry did not have access to the technical expertise and equipment to capture video images *in situ* where low-light conditions make this difficult.

Design of BRDs necessitates information on fish behavior in response to different stimuli such as the change in water pressure and direction associated with a bycatch reduction device. Development of a salmon BRD for pollock nets would require observation of how salmon behave in a pelagic pollock net relative to pollock, and lacking this, development of concepts for excluders would likely not be productive. Observation of differences in location, swimming ability, or response to stimuli have been critical to the development of effective BRDs (Glass and Wardle 1995).

In the context of the costs of salmon avoidance with available tools, there appears to be large potential benefit from an effective salmon BRD for the BS/AI pollock fishery. Given the information obtained from some preliminary video footage of chum salmon behavior in a pelagic pollock trawl, we believe there are promising behavioral difference between the target species and salmon that will allow for the development of an effective BRD (Dr. Craig Rose, Alaska Fisheries Science Center, personal communication). The question now is how to proceed most efficaciously with development of such a device.

Experience with development of BRDs for the Alaska trawl fisheries has shown that exempted fishing permits are an effective way to develop bycatch reduction gear. That

experience has underscored the value of systematic testing under a rigorous experimental design. In the experience of the fishing industry, informal efforts to test net modifications in an *ad hoc* manner are not often productive because a fishermen working independently typically does not subject his modification ideas to systematic testing. While fishermen often possess a strong grasp of technical aspects of fishing gear in combination with outstanding ingenuity for adaptation, the coordinated and systematic approach of testing gear modifications through an EFP collaboration of science and industry is a more productive way to develop BRDs.

Exempted Fishing Permits (EFPs) offer advantages given the relatively high cost of research charters on the scale of vessels primarily used in the BS/AI pollock fishery. Because harvest limits are typically set below the allowable biological limits (referred to as ABC) in the federal fisheries off Alaska, additional fishing opportunities can be used to help fund research and development costs of conservation engineering without biological effects on stocks. In addition, there are benefits to evaluating gear modifications under the most realistic fishing scale and conditions. In our experience, research charters can be a difficult and potentially very expensive and possibly less effective way to recreate actual fishing conditions compared to an EFP test. For these reasons, an EFP is the best model for developing a salmon excluder.

Evolution Of The Concept Of A Salmon Excluder Device For The Pollock Fishery
The first step in the development of prototype salmon bycatch reduction devices has been to tap into the fishing industry's ideas on how such an excluder might function. A meeting that attempted to accomplish this goal was held by the United Catcher Boat Association (UCB) in the spring of 2002. The product of the meeting, however, was strong support for the development of an excluder device but none of the participants had any existing designs for such an excluder.

Following that meeting, Dr. Rose of the AFSC carried out a research charter on a pollock vessel in the summer of 2002 to deploy low light camera equipment and a new technology called "acoustic video" to obtain images of how salmon and pollock behave in the portion of a trawl net called the tapered intermediate. Dr. Rose was also able to perform some basic net modifications (cutting an escapement portal) to get some idea of how salmon react to such an escapement opportunity. This preliminary work suggests that, as would be expected, salmon are stronger swimmers compared to pollock. In addition, it appears that salmon may prefer to swim in the upper (furthest from the seafloor) portion of the trawl intermediate.

Dr. Rose's video and digital footage from his charter last summer are currently under review by trawl skippers and gear manufacturers. While still preliminary, some concrete ideas for excluder designs have emerged (John Gruver, Catcher Vessel Inter-cooperative Manager, personal communication). A depiction of a potential prototype devices is seen in Figure 1 below. The device depicted in the drawing is based upon a funnel of smaller mesh webbing placed within the mid-section portion of the trawl. The funnel would attempt to create an eddy in the water flow at the aft section of the device where

escapement portals would be used to provide salmon an egress opportunity (here shown with a recapture device attached).

INSERT DRAWING as Figure 1 (sent by fax)

This application is for an EFP seeks an allowance of pollock and bycatch species to test the most promising prototype salmon excluder that is developed through a set of steps outlined in this EFP application. An iterative development process with research charters leading into a formal EFP test has been followed previously in 2000-2001 for the successful development of a halibut excluder for Pacific cod trawls (Rose 2001). In that earlier process, industry had some conceptual expectations for what a halibut excluder for cod trawls would require in order to allow halibut to escape without compromising cod catch rates but no one had a clear design idea at the outset. In the case of this EFP application, the video footage may provide a better starting point by providing information about the behavioral differences between target and bycatch species than was available for the cod excluder EFP project in 2000-2001.

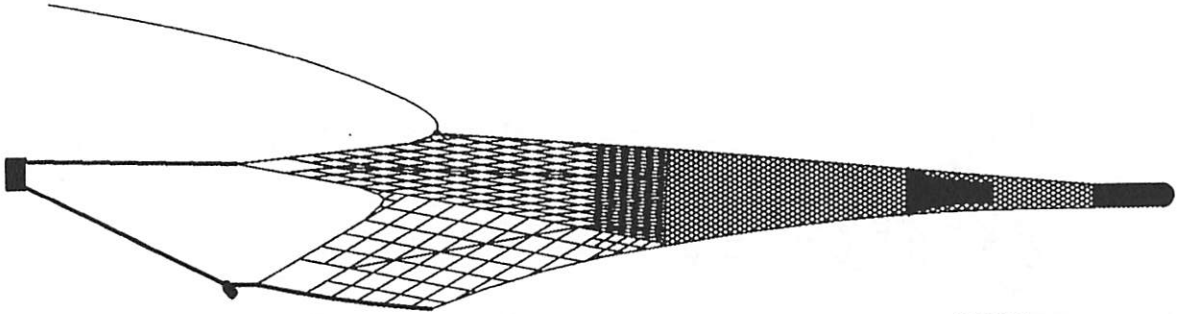
Application For An Exempted Fishing Permit: Statement Of Purpose
The objective of the project is to develop a salmon excluder for the BS/AI pollock fishery that allows escapement of a significant proportion of salmon that are herded into the net without significant reduction in catch rate of pollock. The use of "significant" in this statement is to illustrate the inherent tradeoff: for practicability reasons, the rate of reduction in salmon catch has to be balanced against the any reduction in the rate of pollock catch. Likewise, the overall ability to determine the benefits of the device requires information on the survival of salmon. Therefore, an explicit objective of this work is to evaluate the expected mortality rate of salmon utilizing the device. The specific purpose of the EFP portion of this overall project is to perform a scientifically sound evaluation under actual commercial fishing conditions of the proto-type BRD developed for the test.

<u>Attributes of a successful salmon excluder are:</u>

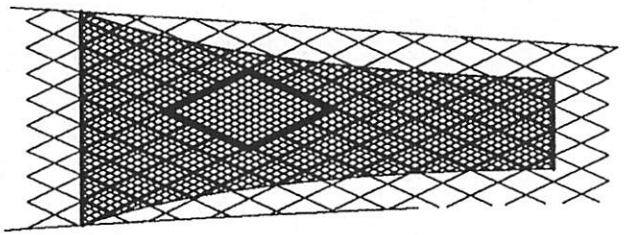
1) Effective performance in terms of reduction in salmon bycatch and minimization of the loss of pollock
2) Avoidance of injury to salmon escaping the trawl
2) Resistance to failures, break downs, and clogging
3) Ease of removal and re-installation in cases where salmon bycatch in not problematic and attendant loss of target catch would not justify continued use of the device
4) Durability and ease of storage on deck
5) Construction from affordable materials that are readily available.

These criteria collectively describe the desired end product of the process of development of a salmon BRD. As is described below, the EFP plays an important role in the

1. Side view of a pelagic trawl with excluder device installed.



Close-up of excluder device:



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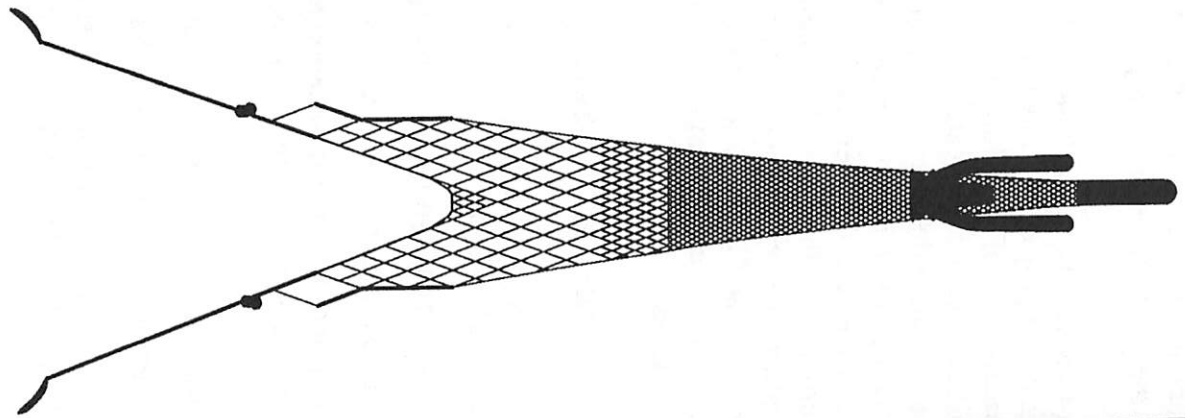
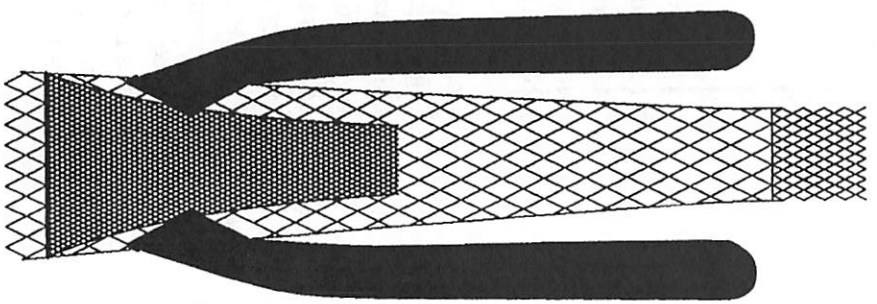
2. Overhead view of a pelagic trawl with excluder device with recapture bags.





Close-up of device with recapture bags:

determination of the effectiveness of the device to exclude salmon with minimal mortality, retain pollock catches, and function reasonably and practically.

Description Of Work:
A meeting with trawl skippers and gear manufacturers was conducted in the spring of 2002 to discuss the possibility of developing a salmon excluder and get fishermen's ideas on how such a device might operate. Additional industry meetings will be held in March and April of 2003 to get additional information and design ideas from skippers based on their review of Dr. Rose's video work. The designs generated from the input above will be used to develop several prototype models of excluders.

During the same period, the EFP applicant, in conjunction with the NMFS RACE division, will develop materials for and eventually conduct an RFP process to seek applications for a vessel to conduct the EFP work. The RFP process (described in detail below) will be used to set out the responsibilities of the applicant vessel owners to build the excluder prototype devices as per the designs and conduct the testing under the prescribed experimental design. Applicants for the field work must make a commitment to carry out both stages of the field tests, one this fall on chum salmon and one next spring targeting escapement of Chinook salmon

Application materials developed for the RFP process will describe such things as the amount of target catch available to the successful applicant for each stage of the field work, the responsibilities of the applicant to provide facilities and materials for the EFP work, and the terms under which the test will be cancelled or postponed if unanticipated and unmanageable circumstances arise, the physical and staffing requirements of the vessel used for the test, and other information critical to the EFP test.

For the summer of 2003, Dr. Rose has scheduled another research charter to pre-test the designs for a chum salmon excluder (that are developed from the second set of meetings with pollock fishermen) just prior to the chum salmon portion of the EFP work. That charter work will be used to determine which proto-type device appears to produce the highest reduction in salmon and retention of pollock catch. Approximate measurement of deployment and performance of the prototype devices in the NMFS research charter this summer will be through video observation only.

The first stage of EFP field test work on chum salmon is planned for the early fall of 2003. The vessel selected for the work will pick up the materials and project personnel (EFP applicant, Dr. Rose, NMFS-certified fishery observers) in Dutch Harbor and conduct the field work.

The measurement of the effect of the device on salmon and pollock catch will be done through a recapture cod end where salmon numbers in the regular cod end and the recapture cod end can be compared and pollock catch by weight in recapture and regular cod end can be evaluated for each EFP tow (see Experimental Design below).

Following the completion of the tasks outlined above, including the completion of the field work on chum salmon and analysis of the performance of the chum salmon excluder, skippers and gear designers will once again be invited to submit designs and ideas for adapting the excluder to work for Chinook salmon escapement for a second field test that will occur during the winter/spring pollock season. Chinook bycatch has traditionally been problematic in the winter/spring fishery, where fishing and environmental conditions are somewhat different. Differences in swimming ability or response to the excluder between chum and Chinook salmon may also require modification of the excluder to maximize its performance for Chinook escapement adaptation. This second interface with industry to get ideas for adaptation of the BRD device will occur during the late fall and early winter of 2003.

Following this developmental work, the vessel used for the chum salmon work will once again be used for EFP field work, but this later test will evaluate ability of the modified device to release Chinook salmon while retaining target catches of pollock. This Chinook salmon escapement test may be preceded by a second research charter if modifications to the excluder design to allow Chinook escapement are sufficiently large to merit a pre-test. There is currently no confirmed funding for this second NMFS charter to pre-test design modifications next spring, but such funding is currently being sought by Dr. Rose and the pollock industry.

Itemized Tasks And Schedule:

1) Meetings with skippers, gear manufacturers, Dr. Rose to develop concepts for excluder devices (January- April, 2003)
2) NMFS review of EFP application (February-April, 2003)
3) Preparation of materials for RFP process for chum salmon test
4) Meetings with skippers returning from 2003 A season and review ideas and designs for excluders
5) Administration and coordination of RFP process to select a vessel for the EFP field work (following EFP approval starting in May or June of 2003)
6) Assist Dr. Rose's preparation for pre-test charters this summer (starting in April or May, 2003)
7) Field work for pre-test of device under NMFS research charter in Puget Sound (June, 2003)
8) Field work for NMFS research charter in Bering Sea to pre-test designs for chum salmon excluder prior to EFP test
9) Field work for EFP test in Bering Sea (September, 2003)
10) Data entry and analysis for EFP test (September-October, 2003)
11) Preparation of report on performance of chum salmon excluder (November 2003)
12) Meetings with industry on design modifications for Chinook excluder device (starting November 2003)
13) Preparation of EFP field work for Chinook salmon excluder (November-December 2003)
14) Pre-test of Chinook excluder under NMFS research charter (tentative, January 2004)

15) Field work for EFP test of Chinook excluder (January or February, 2004)
16) Data entry and analysis for Chinook excluder portion of work (February-March 2004)
17) Presentation of results of Chum and Chinook excluder EFP results and submission of final (April 2004 or as requested by NPFMC).

Responsibilities Of Parties For The EFP Project

Critical to the success of the development of a BRD and the use of an EFP to test its performance are clear assignments of duties, expectations, and contingency planning steps for all parties involved in the work. While not all of the possible outcomes can be anticipated, experience has shown that some aspects of the work are more likely to experience unavoidable roadblocks and thus benefit most from planning for contingencies. Clearly defined roles in project management are key elements of project success.

Responsibilities of EFP applicant:

1) Drafting of EFP and modifications based on NMFS and other review
2) Project coordination and troubleshooting of unanticipated events and circumstances
3) Holding informal meetings to collect information on a voluntary basis from fishermen and gear manufacturers
4) Preparation of materials for RFP process to select vessel for field work (in conjunction with NMFS RACE Division).
5) Coordination of RFP process under direction of NMFS RACE Division
6) Preparation for, staffing of, and project management for at-sea work. Note: as has occurred in the past, EFP applicant serves an intermediary role for monitoring progress of field work, making sure project stays within prescribed catch and bycatch limits, and assisting negotiations with vessel owner if unanticipated circumstances affecting conditions of the permit arise.
7) Under circumstances where EFP field work will clearly be unable to accomplish the desired objectives of the test (e.g. salmon are not able to be located at all, device does not appear to be functioning in the intended manner at all (release of salmon unharmed and retention of target catch), EFP applicant, in consultation with NMFS RACE Division and NMFS Regional Office will attempt to re-schedule, postpone, or modify project. Should this situation arise, the goal would be to make best use of resources expended for the project and minimizing economic losses of industry to the extent practicable.
8) Technical and material assistance in data set preparation and analysis of EFP data
9) Preparation of reports to the interested public on BRD performance and presentations of results as per NPFMC direction

Expectation of work and assistance from NMFS Race Division and NMFS Regional Office

1) Review of EFP application, development of EA or other supporting analysis for EFP application, approval and implementation via federal approval process (AFSC and AK Region)

2) Oversight and assistance of project coordination and troubleshooting of unanticipated events and circumstances (AFSC)
3) Attending (as necessary) informal meetings to collect information on a voluntary basis from fishermen and gear manufacturers (AFSC)
4) Review of materials drafted by EFP applicant for RFP process to select vessel for field work (AFSC)
5) Review of EFP field work applications and selection of preferred vessel application (AFSC)
10) Project management for at-sea work and assistance with handling contingencies that may arise (AFSC, possibly AK Region)
11) Technical assistance in data set preparation and analysis of EFP data
12) Assistance with preparation of reports on BRD performance and presentations of results as per NPFMC direction, as requested (AFSC)

Responsibilities of vessel owner or his agents for vessel selected to do EFP field work

1) Timely submission of a completed application for the EFP field work
2) Signed commitment to carry out the field work (unless released by NMFS or EFP applicant) under the negotiated timing for the chum salmon BRD test work (fall 2003), and Chinook salmon BRD test (winter/spring 2004)
3) Furnishing materials for and providing for the construction of the BRD devices (up to three devices) under the direction of Dr. Craig Rose prior to each stage of the EFP field work
4) Conducting the field work as specified in the application materials and EFP permit including taking specified number of scientists, project managers, and fishery observers for field work and provision of and payment for the specified number of NMFS-certified fishery observers
5) Signed agreement to waive any confidentiality claims to data generated by EFP testing or pre-testing

Experimental Design

Recapture device in lieu of comparisons of modified and non-modified trawl net comparisons The fundamental element that drives the design of this EFP test is the use of a secondary trawl webbing device to capture and account for fish that exit the trawl through the excluder device. This approach is taken in lieu of a design which sets out to compare the performance of a modified trawl (with the excluder) to an unmodified trawl. While both approaches have merit, measurement of the performance of the salmon excluder device in this test is more practical with a recapture device.

The need to structure this test around the use of a recapture device became evident when salmon bycatch data from salmon hotspots were evaluated. The data demonstrate that even if areas with relatively high bycatch rates are targeted for the experimental work, salmon bycatch would not be expected to occur consistently on each trawl tow. This was not the case in previous work to test BRDs for halibut, where it was a reasonable expectation that most trawl hauls in the Gulf of Alaska or Bering Sea will have at least some halibut bycatch and conditions affecting the probability of catching halibut on a given tow were not highly variable. In the case of this salmon excluder test, if a

comparison of modified versus unmodified nets were untaken, the desired number of pairs of reasonably similar tows (pairs of tows under similar conditions) would require a prohibitive amount of experimental fishing because the relative inconsistency and rarity of salmon bycatch. For this reason, a recapture device is preferred.

Experience with experimental tests on trawl modifications raises the issue that the "recapture" device may affect the performance of the device to some degree. The manner in which this could occur is by changing the direction or magnitude of water passing through the trawl webbing (such as would not occur with the excluder alone) thus affecting the shape and function of the trawl meshes in that portion of the trawl and hence possibly affecting the probability of escapement of the bycatch or target species. The potential ramification is that the device under the test conditions with a recapture device would not function as it would be expected to perform in actual commercial fishing with the excluder but without the recapture device. Under certain conditions, performance differences with the recapture device might be in the positive or negative direction depending on the actual effect of the recapture device on the excluder portion of the trawl modification.

While it is recognized that a recapture approach to the test can pose problems for determination of the performance of the BRD, this project includes a component to evaluate the effects of the recapture device on the function of the excluder. This will be accomplished through camera devices placed in specific locations during the pre-test charter work. This will allow for adjustments in the size or placement of the recapture device to correct for recognized problems. For instance, if trawl mesh tension appears to be affected by the recapture device or if fish appear to mill around the egress point of the excluder, adjustments can be made to rectify this situation. While this approach cannot guarantee that the effects of the recapture device will be removed completely, at least by the time of the EFP experiment, steps will have been made to reduce its effect to the extent possible.

Statistical Power To Detect An Effect

A pelagic pollock trawl is equipped with very large meshes (30 meters or greater) in the in the mouth and wings of the net which gradually taper to as little as four inch meshes in the codend. This reduction in mesh size occurs over a distance of approximately 400 meters (stretched mesh basis). Salmon and pollock can escape through the large meshes in mouth and wing sections of a pelagic net, but once they have been successfully herded back into the smaller meshes of the net, there is little chance of escapement from an unmodified trawl due to the relatively small openings.

An important consideration regarding experimental design is that once the pollock and salmon are in the small mesh sections of the trawl intermediate, there are only two possible outcomes for a net rigged with an excluder device. Specifically an individual fish (pollock or salmon) can drop back into the trawl codend or it can "escape" through the excluder, which means in this case it is retained and accounted for in the recapture device used for our experiment.

This "either/or" set of discrete outcomes is suited to statistical treatments that evaluate the probability of detecting the proportion of effect. In this case, the proportion of interest is the percentage of individual salmon escaping (desired effect of the device), thus the proportion of the total number of salmon accounted for in the recapture device relative to total number of salmon caught in the recapture device and trawl codend.

The conventional approach to determination of sample size for proportions is to generate a statistical power relationship (based on the binomial probability distribution) between sample size and statistical power to detect a given effect at a desired statistical confidence level. This relationship is normally depicted as a curve with sample size on the horizontal axis and the power of detecting a difference of a given magnitude.

Of importance is that the magnitude of the effect that is built into this sample size calculation should be designed to be useful to the research question itself. For instance, designing the sample size for the EFP test around the question of whether the excluder has any effect at all on salmon escapement is not really useful to the fishing industry that must later consider the potential tradeoffs associated with using the excluder. Because the pollock industry is faced with the very real possibility of reducing target catch rates in exchange for lowering the bycatch rate of salmon, the sample size for the experiment needs to be designed to allow detection of a performance difference of a fairly small magnitude in terms of reduction of salmon bycatch from the expected level of performance.

Sample Size Calculation

The specific goal that was selected for sample size determination to test escapement of chum salmon from the BRD is based on the number of chum salmon needed to have an 80% chance of detecting an effect that is ten percent different from the underlying or expected effect, at a 95% degree of statistical confidence. The number of salmon needed for the test essentially drives sample size because pollock are obviously far more abundant relative to salmon. Effectively, this means that our confidence that we have correctly detected the effect of the device on pollock retention will occur long before we are confident on the question of how the BRD affects salmon escapement.

Although we have some preliminary information from Dr. Rose's video work suggesting that salmon will egress through an aperture in the top panel of a pollock net, we have no *a priori* or empirical notion of the underlying proportion of salmon that will successfully make use of the excluder developed for the test. Lacking an expectation for this underlying proportion, the risk averse approach to sample size determination (so as to avoid under-sampling) is to assume a proportion of 50%, (probability of 0.50). This, in effect, maximizes sample size for a given set of desired statistical power and desired degree of statistical confidence.

For the chum salmon escapement portion of the experiment, we assumed an underlying proportion of effect (salmon utilizing the escapement device) of 50% ($\bar{p} = 0.5$). Our goal is thus to have sufficient statistical power to have an 80% percent probability of detecting a 10% difference in proportion of effect from the underlying proportion of 0.5

with 95% statistical confidence (alpha =0.05). A statistical power curve for those criteria is reproduced in Figure 2 below.

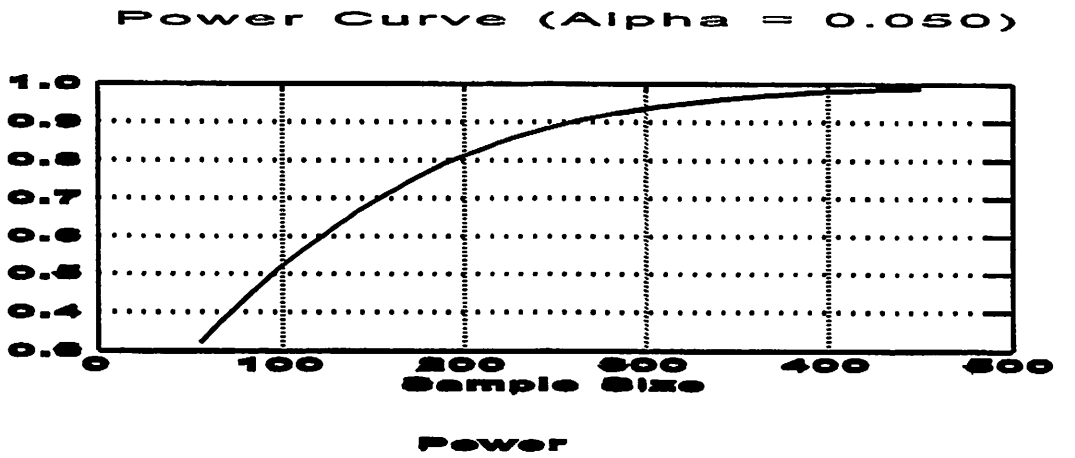


Figure 2: Probability of detecting difference from proportion of 0.6, when the underlying proportion is 0.5

Figure 2 above shows that the desired statistical power for the EFP test requires a sample size of 200 salmon. Recall that the driving factor for sample size is the number of salmon encountering the excluder. This means that for the first part of the EFP work on chum salmon, the goal would be undertake fishing that has an expectation of encountering at least 200 chum salmon.

Calculation of Pollock Catch That Would Be Expected To Generate A Sample Of Approximately 200 Chum Salmon

Because salmon are essentially a byproduct of pollock target fishing, the desired sample size of 200 chum salmon cannot be explicitly and directly generated in an EFP test for the pollock fishery. A practical means of obtaining a sample of 200 chum salmon is to estimate the quantity of pollock fishing that is likely to generate that number of chum salmon. We have done this below based on past conditions associated with chum salmon bycatch in the pollock fishery. We believe that the most reliable representation of what the fishery will encounter when the test is performed next fall is the chum salmon bycatch rates from fall of 2002. This is because strong runs of salmon tend to persist serially based on trends in ocean conditions and year class strength. Thus the most reliable approximation of the availability of chum salmon to the pollock fishery is last fall's bycatch rates. Based on that approach, the target amount of pollock catch that would be likely to achieve a sample of the desired size is derived below.

To evaluate sample size, pollock and salmon catch location-specific data were obtained on a daily basis from Sea State Inc. for the fall pollock fishery in 2002. Daily bycatch rate information on an area-specific basis was used to evaluate variation in daily chum bycatch rates in a specific area identified by Sea State Inc. as a "hotspot" for chum salmon bycatch. This approach was taken because this EFP work will utilize information on chum bycatch rates from the regular pollock fishery to target a specific area with relatively high chum salmon bycatch rates for conducting the experiment. Experience

has shown that chum salmon tend to aggregate and that areas of relatively high concentrations can be identified at certain times. While certainly not static and not the only areas where chums are taken as bycatch, these areas are identifiable from the fishery bycatch reporting and management system that is now formalized into the pollock cooperative management system, which industry has agreed to make available to this project.

The goal is to focus the EFP test fishing where salmon are abundant and to plan to do enough fishing so that if bycatch rates are somewhat lower next fall or location of a relative concentration is not as effective as in past years, sufficient fishing will still take place to create a reasonably high probability of obtaining the desired sample size of chum salmon. Assuming that our success at finding an area of relatively high salmon concentration is within the range of what has occurred in the past, this approach in conjunction with somewhat modest expectations of expected bycatch rates will serve to generate the desired sample size.

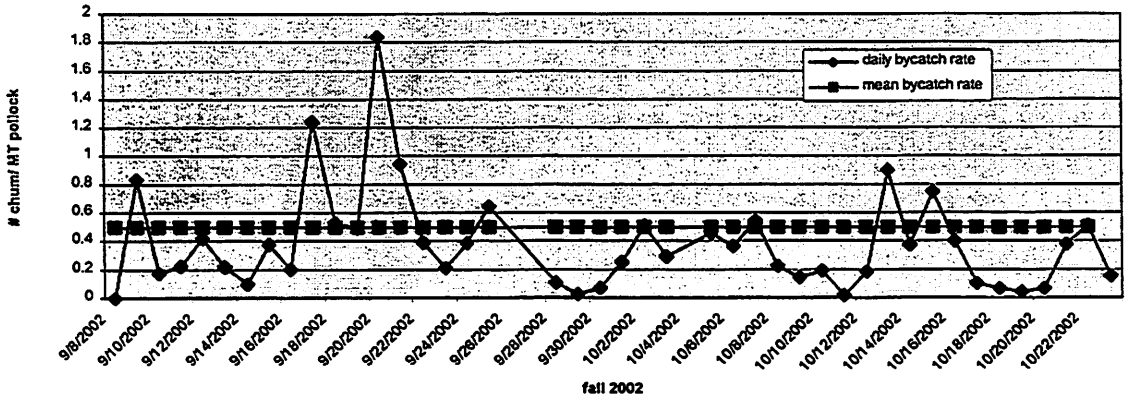
Use Of Fishery Data To Estimate Bycatch Rates For The Chum Salmon EFP Test
In evaluating potential chum salmon bycatch rates, the most useful data for projecting the quantity of pollock catch that would be likely to achieve the target sample size was determined to be data from catcher vessels delivering to motherships during the fall of 2002. This data source was selected for the following reasons. Portions of the Bering Sea shelf area are restricted to catcher vessel operations (Catcher Vessel Operations Area) and this area has consistently experienced relatively high chum salmon bycatch rates (Witherell and Pautzke 1997). For this reason, catcher vessel data was the most applicable for determination of expected chum salmon bycatch rate associated with a concentrated bycatch area.

In addition, for the subset of catcher vessels delivering to motherships, salmon bycatch rate data are available on a haul by haul basis. This allows for assignment of the location and a daily rate of salmon bycatch. Data from catcher vessels delivering to shoreside plants cannot be used consistently to calculate salmon bycatch rates on a haul by haul or daily basis. This is because salmon are not systematically accounted for, in most cases, until observer sampling that occurs at the time of shoreside delivery. For shoreside delivery vessels, quantity of pollock and salmon taken over the course of the fishing trip is the most detailed level of data available. That effectively means bycatch rates for shoreside delivery vessels can only be determined over a three to four day period. During that time, a vessel may fish several different areas, with fish from all areas mixed in the vessel's holding tanks. For this reason, daily chum salmon bycatch rates from catcher vessels delivering to motherships was preferred.

Figure 3 below illustrates daily bycatch rates of chum salmon for an area identified by Sea State to have generally high chum salmon bycatch rates during the fall of 2002. Note that there are several daily periods with relatively high bycatch rates compared to the arithmetic mean rate for the total number of salmon taken by the vessels in the data set divided by the total pollock tons by these vessels. Because the EFP test must be scheduled in advance, and because it is probably unwise to assume that the EFP test will

encounter peak bycatch rates, the expectation for daily salmon bycatch rate used for this calculation of pollock tons needed for the experiment was based on only the days with rates that were less than the mean daily rate during the period of data provided by Sea State (9/8/02 – 10/23/02). This removed 11 of the 42 days for which daily rates were available for catcher vessels delivering to motherships in the zone of relatively high bycatch rates from our data set.

Figure 3: Daily Chum Bycatch Rates



The above treatment of the chum salmon bycatch data attempts to balance the ability to target a chum salmon bycatch hotspots with the practical reality that timing for the EFP is not completely flexible and bycatch rates may not be as high as those peak rates encountered in the hotspots within the CVOA last fall. From the above data and the procedure used to remove all the daily rates above the mean bycatch rate, the baseline bycatch rate of 0.23 salmon per ton of pollock was used to calculate the probably amount of pollock needed to generate the desired sample size. Calculation of that expected quantity of pollock was done in the following manner: 200 (number of salmon for desired sample) divided by 0.23, or approximately 870 MT.

Based on the assumptions made above, this should be a sufficient quantity of pollock to derive a sample of 200 chum salmon for the EFP under conditions that occurred in the recent past. Another 100 MT of pollock catch is needed for the chum salmon portion of the EFP work to allow for two pre-test trawl tows with a closed codend and recapture device to ensure that the device is deploying sufficiently on trawl gear of the vessel selected for the EFP work. This brings the overall pollock catch for the chum salmon portion of the EFP to 970 MT.

Establishment Of Limits On The Amount Of Pollock Available For The EFP
The approach to derivation of sample size for the development of the chum salmon excluder portion of the EFP (and later the Chinook EFP work) was based on determination of a sufficient quantity of pollock that was expected to achieve the desired sample size. In reality, given that chum salmon catch rates vary considerably on a tow by tow basis, it is possible that a large fraction of the expected sample size could come from a few hauls during the EFP. This presents a practical consideration for the EFP test. Given that the opportunity to catch pollock outside of the total allowable catch is being used to help fund the EFP research, the EFP work must be structured around a predictable outcome for the vessel owner who is interested in applying to do the EFP work. Specifically, the applicant needs to know how many tons of pollock are available for the EFP work in order to calculate his costs and expected revenues associated with participation in the field work.

This approach of basing the EFP catch limits on the amount of target catch instead of catch of the desired number of salmon for the sampling design was done specifically to make the EFP work feasible for industry applicants. An alternative approach of conducting fishing until the target number of salmon are caught might mean that the EFP test fishing could be accomplished in a few tows or a very large number of tows with a large amount of pollock catch relative to the specified 970 MT of catch for the chum salmon excluder test. We believe the "fish until you obtain the sample" approach is simply not practical for the applicant who, in the end, has to assume the risk of undertaking all the costs of the experimental fishing associated with the EFP. Likewise, fishery managers are not likely to approve an open-ended amount of pollock for this EFP.

Our approach attempts to strike a balance between the goals of the research, the funding model for a portion of the EFP work, fishery management's need for concrete limits for consideration of an EFP application. The actual ability of the EFP to achieve its goals for chum and Chinook salmon sample generation depends heavily on the reliability of the approaches taken to estimate sample size and associated amounts of pollock catch. We have examined other approaches to generating the desired sample size and concluded that the approach described here is reasonable (based on past experiences with EFPs) and preferable given the needs of all parties.

Sample Size For The Chinook Salmon Field Test Portion Of The EFP Work
As is explained above, differences in behavior and depth preference characteristics as well as factors relating to environmental conditions at different times of year (spring versus summer/fall) make a separate test of the salmon excluder necessary if we are to know how the excluder functions for reducing bycatch of Chinook salmon.

Following the first test of the excluder, a process involving input from fishermen will be undertaken to review potential modifications to the device based on how well it performed on chum salmon and what differences would be expected in terms of its expected performance for Chinook salmon. This process may lead to a decision to change the placement or design of the existing excluder device, or it may simply result in a decision to test the device exactly as it was deployed for the chum salmon test. In

either case, the question of performance of the device should be treated as a separate question, that of "what proportion of the Chinook salmon does the (modified?) device have the desired effect upon relative to the total number of salmon that encounter the device"?

Sample Size Calculation For The Chinook Excluder Test

Unfortunately, given the relatively low expected bycatch rate for Chinook salmon even under peak bycatch timing and conditions, our ability to build statistical power into this portion of the EFP test is lower than it was for the chum salmon test. In the test for chum salmon escapement, the experiment is based upon the ability to discern as small as a 10% difference from the underlying proportion (again $\bar{p}$ is set at 0.50). After evaluating expected bycatch rates for Chinook salmon, it was obvious that this degree of statistical power is not practical for the Chinook EFP test. This is because such statistical power would mean that the EFP would have to catch as much as 8,000 MT of pollock to obtain a sample of 200 Chinook salmon.

For this pragmatic reason, a lower standard of statistical power was adopted for the Chinook salmon BRD test. Our goal for this portion of the test is to have an 80% power to detect a 25% difference from the underlying proportion of 0.50 with 95 % statistical confidence. Sample size under that set of criteria for statistical power is derived below:

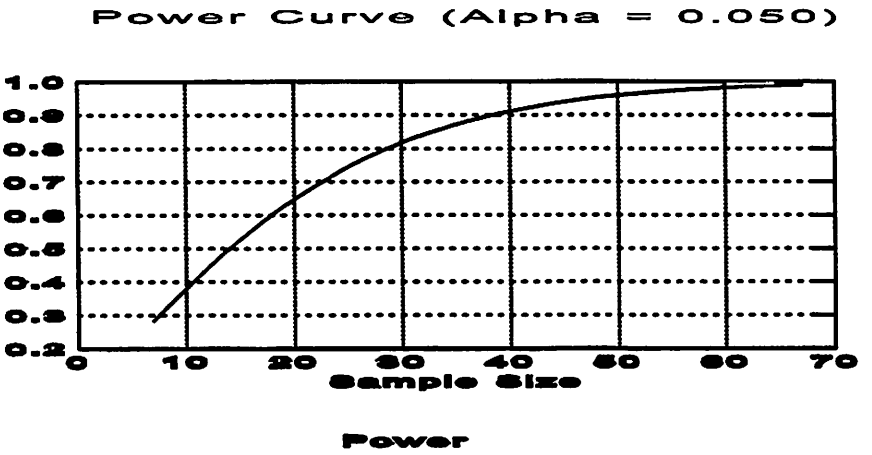


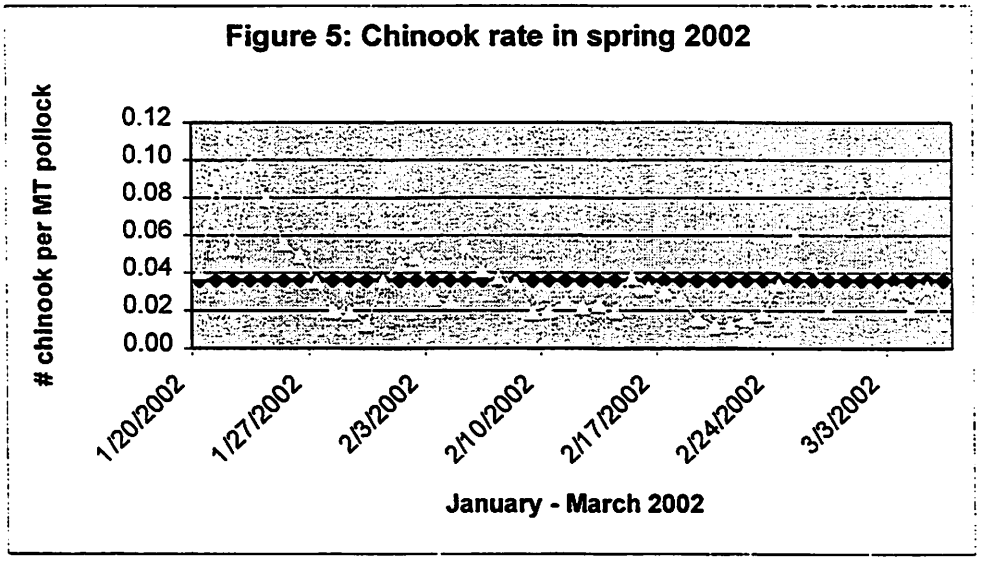
Figure 4: Probability of detecting difference from proportion of 0.75, when the underlying proportion is 0.5

Under this somewhat lower but still meaningful level of resolution to measure the effect of the excluder for releasing Chinook salmon, a sample size of 30 Chinook salmon is expected to provide an 80% probability of detecting a 25% difference from the underlying proportion of 0.50 with alpha set at 0.05 once again (see power curve above). As will be seen below, this sample size is practicable given expected bycatch rates for Chinook salmon. These bycatch rates were once again based on hotspots during the 2002 pollock fishery, this time during the spring pollock fishery.

Use Of Fishery Data To Estimate Bycatch Rates For The EFP Test

Data used to generate an expected rate of salmon bycatch for this portion of the EFP test were once again supplied by Sea State, Inc. This time, however, observed bycatch rates from a Chinook salmon hotspot were from pollock catcher processors during the spring of 2002. In the case of the spring fishery, there are no special regulatory restrictions that affect the areas where catcher processors can fish as was the case for chum salmon bycatch data. The high observer coverage on at-sea vessels fishing in the spring of 2002 makes their data highly suitable for assessing daily bycatch rates.

The same data treatments were performed on this Chinook salmon bycatch rate data as were performed above for the chum salmon data. To remove the effects of the high bycatch rates days from the data, we once again removed all the daily rates above the average (average based on the total number of salmon divided by the total tons of pollock for the period January 20, 2002 through March 6, 2002). That average rate was 0.04 Chinook per MT of pollock. This procedure to drop above-average bycatch rates removed 15 days with relatively high Chinook salmon bycatch rates from the overall number of 45 days in the data set supplied by Sea State (Figure 2 below).



From this procedure, we arrived at a "conservative" daily expected rate of 0.025 Chinook per metric ton of pollock. Once again, the purpose of this manipulation was to develop an expectation of the bycatch rate in an area with a relatively high rate but account for the possibility that the somewhat inflexible timing of the spring 2004 EFP work on Chinook salmon may not allow us to conduct the test during peak periods. If the field work for the test is able to hit a peak period, then sample size will be higher than expected and this will serve to augment the ability of the test to determine the precise effects of the excluder.

Amount Of Pollock Catch That Would Be Expected To Generate The Desired Sample Size of 30 Chinook Salmon For The Chinook Salmon Excluder

Based on the data and data manipulations described above, we calculate that 1,200 MT of pollock needs to be caught to generate a sample of 30 Chinook based on an expected bycatch rate of 0.025 Chinook per ton of pollock (30 Chinook / 0.025 Chinook per MT). Once again, the EFP work will need two pre-test hauls with the cod end and recapture device in place and to make sure the excluder is deploying reasonably for the test work. This brings the overall amount of pollock for this portion of the EFP work to 1,300 MT.

Target and incidental species harvested in the EFP work:

Groundfish: The estimated total harvest of allocated groundfish species including both the chum salmon stage of the EFP work (970 MT of pollock in fall of 2003) and the Chinook salmon stage (1,300 MT in spring of 2004) is 2,270 MT of groundfish. Approximately 98% of which is expected to be pollock and 2% is expected to be other groundfish species such as Pacific cod and flatfish. Retention standards for the EFP work will be the same as those for the directed fishery for pollock.

Pacific salmon: The determination of sample size for each species of salmon for each excluder trial is based on a target amount of pollock catch which, under the assumptions of the EFP work, is expected to have a reasonably high probability of generating the desired sample sizes for the two stages of the EFP. To reduce the risk of "under sampling" if salmon abundance turns out to be lower than it was in the data for the period used to develop sample size calculations, only below average bycatch rates for the period covered by the fishery data used for sample size estimation were used for sample size calculations. This procedure was adopted to increase the probability that the EFP achieves its sampling goals should the EFP fishery work encounter only "below average" salmon abundance conditions in areas where pollock fishing occurs.

An "upper end" estimate for salmon mortality associated with this project is 2,183 chum salmon and 217 Chinook salmon. This estimate was made based an assessment of the highest individual vessel salmon bycatch data used for calculating sample size above. Vessel-specific chum or Chinook salmon bycatch rates (respectively) were evaluated on a weekly average basis to determine what the highest weekly rate for an individual vessel was in our data. These rates (2.25 chum salmon per ton of pollock and 0.17 Chinook per ton of pollock) were then applied to the overall quantity of pollock (including the two test tows) to produce the upper bound estimate of salmon bycatch by species discussed above.

As the Council and NMFS have approved for other EFP experiments dedicated to bycatch reduction, groundfish and prohibited species taken during the experiment should not be counted against the annual total allowable catch and prohibited species bycatch caps. The taking of salmon during the experiment is crucial for determination of the effectiveness of the excluder device. Were the salmon bycatch deducted from the respective salmon bycatch caps, the potential exists that the additional salmon bycatch during the EFP period would increase the chance that annual chum or Chinook salmon PSC limits for the pollock fishery are attained. Thus the additional salmon taken in the experiment would create a burden on the pollock trawl industry and may lead to closures of the salmon savings areas that may not otherwise have occurred. The additional

amount of pollock taken in the EFP is not expected to cause the Bering Sea pollock fishery to exceed its acceptable biological catch. Pollock taken during the testing will be sold to help offset the costs to the vessel operations during the experimental work.

This application also specifically requests that a salmon bycatch limit not be set for this EFP experiment. The success of the EFP work depends on our ability to target areas with concentrations of these salmon for the benefit of the experimental work. Further, catching additional salmon will increase the ability of the EFP work to determine the effectiveness of the excluder device. Even if the upper bound estimates of salmon catch numbers for the EFP work were attained, these are relatively small numbers of mostly juvenile salmon compared to respective biomasses. We believe that the merits of the research in reducing salmon bycatch outweigh any potential effects such salmon removals associated with the EFP work might have.

Further, an exemption from salmon bycatch management regulations establishing fishing area closures for the pollock and groundfish fisheries is also requested. The current array of salmon bycatch management rules include two types of area closures. One is for areas that are closed annually on a certain date. The other are closed areas that result from attainment of a PSC cap (trigger) number of salmon. These exemptions are proposed because the success of the EFP work depends on an ability to conduct the experiment in areas where salmon are concentrated.

On-Board Sampling and Data Collection

Expectations for at-sea sampling during the EFP work need to reflect the scientific objectives of the EFP work and the practical realities of what is possible on a Bering Sea pollock catcher vessel, the most appropriate platform for the EFP work. Performance of the excluder on Bering Sea pollock catcher vessel is the initial focus of the EFP work because catcher vessels catch the majority of the pollock harvest in today's pollock fishery. Additionally, catcher vessels also have restricted access in the summer and fall pollock fishery to an area known to be a salmon bycatch hotspot, the Chum Salmon Savings Area. Recognizing the physical limitations of typical Bering Sea pollock catcher vessels, which typically range in length from 90 to 130 feet in length (LOA), the following sampling design will be used for this project, subject to adjustments during the consideration of vessel applications for the EFP work.

<u>Variables of primary interest for deck sampling to measure the effect of salmon excluder device</u>:

1. Number of salmon in recapture net and codend (per tow)
2. Quantity of groundfish in the recapture device and codend (per tow)
3. Length frequency of salmon in recapture device and codend (per tow)
4. Length frequency of approximately 100 pollock from cod end and recapture device (each) per tow (depending on workload issues, this may not be possible on a tow by tow basis)
5. Determination of sex of pollock taken for length frequencies from cod end and recapture device (as workload allows)

EFP vessel log information of interest for EFP work:

1. Towing speed (average speed over ground)
2. Notations on whether vessel turned around during a haul or slowed or stopped for any reason
3. Sequence and duration of hauls (date of haul, start and end time, start and end time at fishing depth and start/end times for nets towed at non-fishing depths, (such as short-hauling))
4. Area where fishing occurred (Lat/Long of tow start and end points)
5. Average depth of bottom in fishing area and average fishing depth
6. Incidental observations of captain on surface light conditions and sea state
7. Incidental observations of captain on handling issues associated with rigging of or setting/retrieving net with excluder installed

To adequately collect data for the variables of interest for the EFP work, two NMFS-certified at-sea observers may be required for the at-sea EFP work. On deck facilities of certain catcher vessels may preclude complete removal of salmon from the catch in the main codend. Such vessels may be considered for the EFP if they have multiple RSW tanks that allow separation of the catches from each haul, which would then be re-screened during offloading of the catch at processing facilities. To allow consideration of alternative sorting and sampling proposals for these vessels, proposals for one at-sea observer and one additional observer stationed at the processing plant may be considered.

Vessels with a functional conveyor belt (or device with similar function) that can be used to transfer catches from the codend and recapture device to the holding tanks may be preferred. This could greatly facilitate removal of salmon from the pollock depending on the actual placement and function of such conveyors. Lastly, a catcher vessel with a NMFS-approved motion compensated flow scale, allowing more accurate estimation of total catch, may be preferred for the EFP work.

Data analysis will primarily focus on the estimation of the proportions of pollock and salmon excluded from the catch through the device. The experiment is designed to estimate these values for the combination of all tows, representing the value of the device in ordinary fishery conditions. Variability of escape rates between tows will be examined for indications of conditions affecting excluder performance. Combined size composition data will be tested for differences between retained and escaping fish. Video footage taken during the experiment will be reviewed to assess the physical condition of salmon that egress through the excluder into the recapture device. Results and analyses will be compiled into reports and presentations that will be made available to managers, trawlers, scientists and the interested public.

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