PUBLIC REVIEW

DRAFT

REGULATORY IMPACT REVIEW/ INITIAL REGULATORY FLEXIBILITY ANALYSIS

for a proposed

Chinook Salmon Bycatch Data Collection Program

North Pacific Fishery Management Council

December 2009

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1.0 INTRODUCTION

The groundfish fisheries in the Exclusive Economic Zone (EEZ) off Alaska are managed by the National Marine Fisheries Service (NMFS) under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Under the authority of the MSA, the North Pacific Fishery Management Council (NPFMC) developed Fishery Management Plans for the groundfish fisheries of the Gulf of Alaska management area (GOA) and Bering Sea and Aleutian Islands management area (BSAI).

This Regulatory Impact Review (RIR) evaluates the costs and benefits of the proposed Federal regulatory amendment that would implement a data collection program to evaluate the effectiveness of the BSAI Amendment 91 Chinook salmon PSC reduction measures. Specifically, the data collection program is to verify the conclusions drawn by industry in the Incentive Plan Agreement (IPA) annual reports. In addition, the data collection program would be used to (1) evaluate the effectiveness of the measures adopted under Amendment 91, including the incentives arising under any IPA, and the effects on Chinook avoidance of the structure of created by the hard cap, IPAs, and the performance standard established under Amendment 91, and (2) evaluate how the Council's action affects where, when, and how pollock fishing and Chinook PSC avoidance occur.[1]

Presidential Executive Order 12866 and the Regulatory Flexibility Act (RFA) mandate that certain issues be examined before a final decision is made. The RIR is provided in Chapter 2, and Chapter 3 provides an Initial Regulatory Flexibility Analysis as required under the RFA. Chapter 4 includes a description of how the proposed action is consistent with the Magnuson-Stevens Act. References and lists of preparers and persons consulted are provided in Chapters 5, 6, and 7.

At its June 2009 meeting, the Council received a report from the Comprehensive Data Collection committee, which met in May 2009 to discuss a potential data collection program that would assess whether the newly adopted Chinook salmon bycatch program is achieving its intended effects. Based on the committee's recommendations, the Council advanced for analysis four potential data collection programs to supplement existing data sources. The alternatives would collect some or all of the following elements: price and quantity of salmon and pollock quota transactions, surveys of skippers indicating the rationale for inseason choices of pollock fishing grounds, surveys of the cost of inseason movements, surveys of roe production and sales, and surveys of daily vessel operating costs (such as labor and observer costs). During the summer, a public stakeholder workshop was held to develop survey instruments and to discuss the timing of surveys and the information to be collected. The Council reviewed a draft analysis of those alternatives at its October 2009 meeting. Based on that review, the Council adopted a purpose and need statement and revised the alternatives to exclude the collection of roe production and sales and certain daily operating costs. The Council also directed staff to revise the analysis in response to these changes and release that analysis for public review and action at its December 2009 meeting.

1.1 Purpose and Need for the Action

At its October 2009 meeting, the Council adopted the following purpose and need statement for this action:

[1] The environmental impacts of the pollock fishery, particularly those impacts relative to Chinook PSC are fully described in the Environmental Impact Statement for Amendment 91 to the BSAI groundfish fishery FMP. This action defines a data collection program for assessing the effects of the management measures adopted under Amendment 91. This action therefore has no effect individually or cumulatively on the human environment (as defined in NAO 216-6). As such, it is categorically excluded from the need to prepare an Environmental Assessment.

In April 2009 the Council approved Amendment 91 to the BSAI groundfish fishery FMP to reduce Chinook salmon bycatch in the Bering Sea pollock fleet. Under Amendment 91, the pollock fishery has the option of participating in a NMFS-approved Incentive Plan Agreement (IPA) to access a higher hard cap than is available in the absence of an IPA. The IPAs provide a new and innovative method of bycatch management. A data collection program is needed in conjunction with Amendment 91 to understand the effects and impact of the IPAs. The data collection program will focus on: (1) evaluating the effectiveness of the IPA incentives in times of high and low levels of salmon bycatch abundance, the hard cap, and the performance standard in terms of reducing salmon bycatch, and (2) evaluating how the Council's action affects where, when, and how pollock fishing and salmon bycatch occur. The data collection program will also provide data for the agency to study and verify conclusions drawn by industry in the IPA annual reports. To ensure that a full assessment of the program is possible, the data collection program should be implemented at the time Amendment 91 is implemented or as soon as practicable.

To ensure that a full assessment of the program is possible from the start of the program, the data collection program should be separated into two phases, with a suite of data collection measures implemented at the time Amendment 91 goes into effect and sent to the Comprehensive Economic Data Collection Committee after IPAs have been fully developed and submitted to NMFS.

1.2 Alternatives

The Council has adopted the following alternatives for analysis and consideration:

Alternative 1
Status quo (existing data sources)

Alternative 2A
In addition to the status quo data sources:

(1) Transaction data for salmon – quantity and price of transfers (survey will be used to determine whether these are arm's length transactions). As defined by:

Option 1 – Transfer Ledger: All entities holding Chinook bycatch credits will track all transfers from the beginning of each year in an official ledger that would be submitted to NMFS at the end of the year.

Option 2 – Compensated Transfer Form: Require that IPAs and AFA Cooperatives summarize initial holdings of Chinook by vessels or other entities, and that they summarize all transfers regardless of whether the transfers were "compensated" transfers. For all "compensated" transfers, each party (transferor and recipient) must complete and submit to NMFS a Compensated Transfer Form. A transfer is "compensated" if there is an exchange of dollars (or any currency) for bycatch credits from one party to another.[2]

(2) Information regarding change in fishing grounds:
Defined by the collection of estimated gallons of fuel burned in moving to the next fishing location when moving to avoid salmon bycatch
[To be used with existing information allowing examination of:

[2] It should be noted that "Chinook bycatch credits" and "holdings of Chinook" both refer to Chinook PSC allowances.

a. For both the original and new fishing grounds, the date, time, bycatch rate, location, and CPUE of tow.
b. Pollock quota remaining for harvest and salmon allowance remaining at time of event.
c. Time, distance, and use of fuel in searching for cleaner fishing grounds.]

Alternative 2B
In addition to the status quo data sources:

(1) Transaction data for salmon and pollock– quantity and price of transfers (survey will be used to determine whether these are arm's length transactions).

By expanding Options 1 and 2 from Alternative 2A to include pollock quota.

(2) Information regarding change in fishing grounds (as defined under Alternative 2B)

Alternative 3
In addition to the status quo data sources:

(1) Transaction data for salmon and pollock– quantity and price of transfers (survey will be used to determine whether these are arm's length transactions). (as defined under Alternative 2)
(2) Average annual hourly fuel burned fishing and transiting and annual fuel purchases in cost and gallons to be used to:
estimate costs of moving vessels to avoid salmon bycatch (vessel fuel use, transit time, and lost fishing time).
(3) Post-season surveys of skippers to determine rationale for decision making during the pollock season (fishing location choices and salmon bycatch reduction measures).

1.2.1 Alternatives considered but not advanced for analysis

The Council also considered alternatives that would collect more detailed revenue and cost data (including roe production and revenue data and daily operating cost data). Collection of these data would be intended to facilitate improved study of the effectiveness of salmon bycatch measures (including IPAs) across various segments of the fleets and an improved understanding of the effects of those measures on participants in the fisheries. Specifically, these data could be used to examine revenue and cost tradeoffs of vessels in avoiding Chinook PSC.

While acknowledging that these additional data could improve the information concerning the fishery and Chinook PSC avoidance, the Council elected to remove alternatives collecting these data from consideration at this time. The removed alternatives were believed by the Council to contain too many aspects that would require additional time to fully develop and implement, which could result in a delay in analysis and implementation of this action. In its purpose and need statement, the Council expressed its intent to have collection of these additional data considered by its comprehensive data collection committee after IPAs have been developed by industry. This later consideration could allow this data collection to be limited in focus, which might allow for earlier implementation of this action. In addition, by incorporating the more expansive data collection into a later action, the Council hopes to allow for additional development of a more considered broad data collection program.

1.3 Development of data collection regulations

In developing data collection initiatives, the Council should consider how much detail about the data collection it wishes to incorporate into its action, and how much detail it recommends including in regulations implementing the data collection program. The Council has two options:

1. **More general regulations** that list the categories or types of data that would be collected, but do not include details about the data elements. The detailed data elements would be included on a

form associated with the data collection. In addition, the form with its detailed data elements would be included in the analysis prepared by Alaska Region staff for the request to the President's Office of Management and Budget (OMB) for approval of the information collection under the Paperwork Reduction Act (PRA). This PRA analysis and OMB approval process is described below.

2. **Detailed regulations** that list each data element that must be submitted and that specifically list any information required to be submitted on a form. The PRA analysis would include the same level of detail as the regulations.

Mandatory data collections require two elements for NMFS to implement: (1) regulations requiring submission of the data, and (2) approval from OMB for the information collection under the PRA. Proposed regulations are submitted to the Department of Commerce for review and ultimately published in the *Federal Register*. Requests for approval of information collections and the associated "PRA analyses" are submitted for approval through NOAA to OMB.

The regulations may be structured in one of two ways. First, the regulations could list the general categories of data that must be submitted and provide the list of detailed elements of the data collection in associated forms and instructions. Alternatively, the regulations could list each data element that must be submitted. If forms are used, each piece of information requested on the form must be specifically listed in regulation. Regardless of which approach is used, the request to OMB for approval of the information must describe the regulations, include a copy of the forms and instructions, and provide information required in the "PRA analyses". If data are submitted voluntarily, regulations are not required, but OMB approval is required for the collection of that data.

OMB requires an explanation in the PRA analysis of what data are requested, why the data are needed, what the data will be used for, and an estimate of the cost, in terms of time and money, of the data collection to the industry and the Federal government. OMB approval for a data collection is indicated by an OMB "control number" and expiration date. When forms are involved in a collection, the OMB control number and expiration date must be displayed on the form.

Requests for OMB approval pertaining to information collections under the PRA may take one of five forms:

1. new collection-of-information (usually associated with a proposed/final rule);
2. renewal of an existing collection every three years (with or without revisions to the requirements through a proposed/final rule),
3. revision of an existing collection (usually associated with a proposed/final rule),
4. change request of an existing collection, or
5. removal of an existing collection.

The first three formats are formal and require submittal of a PRA analyses and public comment on the proposed information collection. A change request is less formal and is used for what NMFS determines are minor changes to an existing collection, with or without a proposed/final rule. Removal of a collection-of-information consists of submitting a specific form to OMB.

NMFS Alaska Region submits a PRA analysis through NOAA and DOC for OMB review and approval when the draft proposed rule is submitted to NMFS Headquarters for review. NMFS may not require the submission of the information until OMB approval is obtained. Public comments are sought by OMB for

each information collection. When the information collection is associated with a proposed/final rule, comments are solicited through the proposed rule published in the *Federal Register*. When the information collection is not associated with a proposed rule, a notice is published in the *Federal Register* soliciting comments on the proposed information collection. Public comments are not solicited on change requests for revisions NMFS determines are minor or non-substantive and are not associated with a proposed rule.

Generally, revisions to NMFS regulations governing the fisheries off Alaska are approved by the Council. Council review occurs either because a regulatory amendment was developed and approved by the Council or because NMFS requested review of the proposed regulatory amendment by the Council. In recent years, and by agreement of the Council, most revisions to recordkeeping and reporting (R&R) regulations have been done by NMFS without review and approval by the Council. NMFS reports to the Council about the status of the proposed R&R regulatory amendment in its management report, but the Council does not agenda these proposed regulatory amendments for review, public comment, or Council action. This procedure is followed primarily to save the Council the time of reviewing routine or non-controversial revisions to regulations. The PRA analyses associated with requests for OMB approval of information collections have never been reviewed and approved by the Council. However, this procedure could be changed for information collections that are not associated with a proposed rule developed by the Council or for specific information collections of concern to the Council.

More general regulations for a data collection program could allow a more flexible, adaptable program because revisions to the elements of the data collection that are not specified in regulation would require only OMB approval, which could be less time consuming than a rulemaking process. However, the Council could sacrifice its involvement in substantive program changes if the Council was not aware of proposed revisions to the data collection being initiated by NMFS or if NMFS determined that a revision to a data collection was non-substantive, when the Council or the industry would consider the revision substantive. These circumstances have occurred with the crab EDR data collection, and this has caused considerable concern by the crab industry.

With the Chinook salmon bycatch data collection, the Council could take action to collect operating costs from Bering Sea pollock vessels, by approving regulations that require submission of a few categories of operating costs, such as crew costs, fuel costs, and other costs aggregated. If the Council did not specify any further recommendations about the detailed data elements that should be collected, NMFS would have discretion to determine the specific data elements needed to collect information consistent with the Council's intent. For example, NMFS may include in the forms developed to implement the data collection the requirement to submit insurance costs, gear costs, or other expenses. Council review of the general regulations would occur when NMFS submitted the draft proposed rule to the Council chair and Executive Director for review and approval prior to the proposed rule being submitted to NMFS Headquarters for review. However, if only general categories of data elements were in the regulations, the forms that would include the detailed data elements also would need to be reviewed by the Council when it reviewed the proposed rule. The forms and PRA analysis have not, to date, been submitted to the Council for review prior to publishing a proposed rule. In addition, if only general categories are included in the regulations and, if NMFS determined after implementation of the final rule that revisions to the detailed data elements were necessary, NMFS could submit a request to OMB for approval of a revision to the form without further input or review from the Council until the public comment period on the proposed information collection.

The Council could avoid this circumstance with the Chinook salmon bycatch data collection in two ways:

1. Require the inclusion of each data element in the regulations; develop the forms and instructions that list the specific data elements that the Council wants collected prior to Council final action;

and request that NMFS not amend these regulations without review and approval by the Council; or

2. Allow the inclusion of general categories of data in the regulations; develop the forms and instructions that list the specific data elements that the Council wants collected prior to Council final action; and request that NMFS not revise the forms or data elements without Council review and approval of the PRA analyses prepared for OMB approval.

Under either of these scenarios, the Council would be provided an opportunity for review and approval before any changes were made to the data collection program, even if these changes were minor. In some cases, modifications to reporting requirements could result in a substantial change in the nature of the information collected and the burden of that reporting. For example, a regulation could state that annual fuel costs should be reported. It is possible the requirement could be interpreted in a few different ways. For example, a vessel owner could be required to report all fuel purchases in a year, by simply consolidating fuel invoices from the year. Alternatively, an owner could be required to report the cost of all fuel used in a year, requiring the vessel owner to monitor fuel consumption, particularly at year end. Modification of the reporting requirement between these two questions would change both the burden associated with reporting and the nature and uses of the data reported.

Substantial changes to the data collection can be costly to industry and, if undertaken in a piecemeal fashion over time could confuse both those submitting data reports and data users. In addition, the Council analysis of the data collection program is likely predicated on the data reporting taking on a certain form and level of detail. Modification to reporting requirements that substantially change the reporting requirements may substantially change the effects of the data collection described in a Council analysis. Whether a particular modification to data reporting requirements is within the scope intended by the Council could be debated under such circumstances.

Detailed regulations or Council review of PRA analyses also could ensure that the Council is the arbiter of disputes over the scope of data collection that might otherwise be decided through a public comment process employed by NOAA Fisheries and the Office of Management and Budget. Council involvement may not only ensure Council intent is followed, but might also provide a forum that achieves greater stakeholder acceptance. To date, the process of modifying data collection has been contentious, with industry and NOAA Fisheries both expressing concern that the other has overreacted to issues and proposed changes to forms. To some extent, review and approval by the Council under either of the two options above would provide a more deliberative forum that minimizes unnecessary contention. With this active authority comes considerable more responsibility, time, staff involvement and cost.

In summary, review of proposed revisions to detailed regulations or review of the PRA analysis would provide the Council with assurances that no changes would be made to the data collection without Council and industry review. However, both of these approaches would take longer than implementing regulations with general categories of required data and allowing NMFS to make revisions to the detailed data elements through approval by OMB of the revised information collection.

2.0 REGULATORY IMPACT REVIEW

An RIR is required under Presidential Executive Order (E.O.) 12866 (58 FR 51735; October 4, 1993). The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement from the order:

> *"In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be*

usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider. Further, in choosing among alternative regulatory approaches agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach."

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant." A "significant regulatory action" is one that is likely to:

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, local or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

2.1 Background

The section contains a brief history of the BSAI pollock fishery and Chinook PSC management. The following subsections are included:

- Regulatory History of Chinook PSC Management
- Amendment 91 to the Bering Sea Aleutian Islands Groundfish Fishery Management Plan
- Proposed IPAs from April 2009
- Overview of the BSAI Pollock Fishery
- Chinook PSC History in the BSAI Pollock Fishery

2.2 Regulatory History of Chinook PSC Management

Historically, the purpose of Chinook salmon PSC management in the Bering Sea pollock fishery has been to minimize Chinook salmon PSC removals to the extent practicable, while achieving optimum yield from the pollock fishery. Minimizing Chinook salmon PSC while achieving optimum yield is necessary to maintain a healthy marine ecosystem, ensure long-term conservation and abundance of Chinook salmon, provide maximum benefit to fishermen and communities that depend on Chinook salmon and pollock resources, and comply with the Magnuson-Stevens Act and other applicable federal law. National Standard 9 of the Magnuson-Stevens Act requires that conservation and management measures shall, to the extent practicable, minimize bycatch. National Standard 1 of the Magnuson-Stevens Act requires that conservation and management measures prevent overfishing, while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

Several management measures have been used to reduce Chinook salmon PSC in the Bering Sea pollock fishery. Chinook salmon taken incidentally in groundfish fisheries are classified as prohibited species and, as such, must be either discarded or donated through the Pacific Salmon Donation Program. In the mid-1990s, NMFS implemented regulations recommended by the Council to control the bycatch of Chinook salmon taken in the Bering Sea pollock fishery. These regulations established the Chinook Salmon Savings Areas and mandated year-round accounting of Chinook salmon bycatch in the pollock fishery.

Once Chinook salmon bycatch levels reached a maximum limit in a Chinook Salmon Savings Area, the area would be closed to any further pollock fishing. These areas were adopted based on historic observed salmon bycatch rates and were designed to avoid high spatial and temporal concentration of salmon bycatch.

The Council started considering revisions to salmon bycatch management in 2004 when information from the fishing fleet indicated that it was experiencing increases in salmon bycatch following the regulatory closure of the Chinook Salmon Savings Area. Vessels that were not fishing for pollock associated with the Western Alaska Community Development Quota Program (CDQ) could no longer fish inside the Chinook Salmon Savings Area. Vessels fishing on behalf of the CDQ groups were still able to fish inside the area because the CDQ groups had not yet reached their Chinook salmon prohibited species catch limit. Much higher salmon bycatch rates were reportedly encountered outside of the closure areas by the non-CDQ fleet than experienced by the CDQ vessels fishing inside. Further, the closure areas increased costs to the pollock fleet and processors.

To address this problem, the Council examined other means that were more flexible and adaptive to minimize salmon bycatch. Since 2006, the pollock fleet has used an Inter-Cooperative Agreement (ICA)[3] to establish a Voluntary Rolling Hot Spot System (VRHS). The VRHS is intended to increase the ability of pollock fishery participants to minimize salmon bycatch by giving them more flexibility to move fishing operations to avoid areas where they experience high rates of salmon bycatch. The VRHS was first implemented voluntarily in 2002 and through an exempted fishing permit in 2006, and subsequently, in 2007, through Amendment 84 to the BSAI FMP.

While the ICA reports on Chinook salmon bycatch suggest that the VRHS has reduced Chinook salmon bycatch rates compared with what they would have been without the measures, concerns remain because of escalating Chinook salmon bycatch through 2007. From 1990 through 2001, the Bering Sea Chinook salmon bycatch average was 37,819 salmon annually. Since 2002, Chinook salmon bycatch numbers have increased substantially. The average from 2002 to 2007 was 82,311 Chinook salmon, with a bycatch peak of 122,000 Chinook salmon in 2007.

In light of the high Chinook salmon loss in recent years, the Council and NMFS, during deliberations on Amendment 91 in 2008 and early 2009, considered several alternative measures to more effectively reduce Chinook bycatch to the extent practicable, while achieving optimum yield from the pollock fishery. The Council and NMFS decided to limit the scope of Amendment 91 to Chinook salmon, leaving in place the existing non-Chinook salmon bycatch reduction measures, because of the need for immediate action to reduce Chinook salmon bycatch. Chinook salmon is separated from non-Chinook salmon because Chinook salmon is a highly valued species and a species of concern that warrants specific protection measures. Additionally, the Council will address non-Chinook salmon bycatch in the Bering Sea pollock trawl fishery with a subsequent action.

2.2.1 Amendment 91 to the Bering Sea Aleutian Islands Groundfish Fishery Management Plan

The Council's April 2009 motion on Chinook salmon bycatch is summarized below. A full version of the motion as passed by the Council is reproduced Appendix A. Amendment 91 will establish a Chinook salmon bycatch cap for each pollock fishery season which, when reached, would require all directed pollock fishing to cease for that season.

[3] Readers should note that NMFS-Alaska Region uses the ICA acronym for incidental catch allowances, which is subtracted from the Total Allowable Catch (TAC) to yield the amount of a species that can be harvested in directed fishing. In this document the term ICA is defined exclusively as an inter-cooperative agreement.

The Chinook salmon bycatch cap (Cap) is 47,591 salmon. The cap will be allocated 70/30 between the A and B seasons to the CDQ groups collectively and to the three AFA sectors, with provision for rolling over unused portions of the A Season Cap to the B Season. The allowances each sector by season are shown below:

A Season: CDQ 9.3%; inshore CV fleet 49.8%; mothership fleet 8.0%; offshore CP fleet 32.9%
B Season: CDQ 5.5%; inshore CV fleet 69.3%; mothership fleet 7.3%; offshore CP fleet 17.9%

If a NMFS-approved Incentive Plan Agreement (IPA) is in place that provides explicit incentives for each participant to avoid Chinook salmon bycatch in all years, even in years of low abundance, then each sector may take up to, but not more than its proportional share of a High Abundance Cap of 60,000 salmon in any two of seven years. However, each sector will be annually evaluated against a Performance Standard. If a sector's annual Chinook bycatch exceeds the sector's portion of the 47,591 Cap in any 3 years within a consecutive 7-year period, then all vessels within that sector will be limited to that sector's portion of the Cap in all subsequent years.

For those vessels or CDQ groups that opt out of an IPA, a maximum backstop cap of 28,496 will be established. Vessels and CDQ groups opting out of the IPAs will be limited by the same proportion of the backstop cap they would have been allowed under an IPA. Any vessel or CDQ group that fishes under the backstop cap will not be evaluated or included in annual calculations of a sector's performance standard.

IPAs must be approved by NMFS on an annual basis. In order to be approved they must meet the following requirements:

- The IPA must represent not less than 9% of the pollock quota and at least two non-affiliated companies.
- An IPA must describe incentive(s) for each vessel to avoid Chinook salmon bycatch under any condition of pollock and Chinook salmon abundance in all years.
- Incentive measures must describe rewards for Chinook salmon bycatch avoidance, penalties for failure to avoid Chinook salmon bycatch at the vessel level, or both.
- The IPA must specify how those incentives are expected to promote reductions in actual individual vessel bycatch rates relative to what would have occurred in absence of the incentive program. Incentive measures must promote Chinook salmon savings in any condition of pollock and Chinook salmon abundance, such that they are expected to influence operational decisions to avoid Chinook salmon bycatch.
- The IPA must describe how it will ensure that each vessel will manage its bycatch to keep total bycatch below the sector level regulatory Performance Standard.

All operators of an approved IPA must submit an annual report for Council and public review by April 1 the following year. The annual report must include:

1. A comprehensive explanation of incentive measures in effect in the previous year;
2. How incentive measures affected individual vessels; and
3. An evaluation of whether the incentive measures were effective in achieving salmon savings beyond levels that would have been achieved in absence of the measures.

Transfers of bycatch allocations (including post-delivery transfers) are allowed within and among CDQ groups, sectors, and cooperatives. Any recipient of a post delivery transfer during a season may not fish for the remainder of that season.

Observer coverage of AFA catcher vessels will increase to 100 percent regardless of vessel length. This increase in observer coverage does not apply to catcher vessels delivering unsorted codends (the detachable end of the trawl net where catch accumulates) to the 3 AFA motherships. NMFS may develop modifications to regulations for catch monitoring at shoreside processors to ensure accurate accounting for Chinook salmon. NMFS will adjust, as appropriate, any other regulations governing Chinook salmon bycatch management in the Bering Sea so they are compatible with the Amendment.[4]

2.2.2 Summary of Proposed IPAs from April 2009

This section contains an overview of the draft Incentive Plan Agreements (IPA) submitted in March 2009 by AFA pollock harvesters to the Council prior to its Amendment 91 decision. Two plans were submitted: 1) the Financial Incentive Plan (FIP), submitted by the At-sea Processors Association, and 2) the Salmon Savings Incentive Plan (SSIP), submitted by United Catcher Boats. These draft IPAs provided context to the Council during its action in April on Amendment 91, and in June 2009 when the Council directed its staff to initiate this data collection analysis.

The primary purpose of this analysis is to examine how existing data sources, or data that are proposed for collection, can be used to measure the effectiveness of the IPAs in reducing salmon bycatch above and beyond a program that does not include IPAs. In other words, the data collection alternatives should work toward differentiating between a program that does not include the High Abundance Cap or the Performance Standard and a program that does include these elements.

Because this analysis is being completed before any actual IPA proposals are submitted to NMFS, components of IPAs reviewed as part of the Amendment 91 analysis will serve as a framework. It is not presumed that the IPAs described below will be identical to the IPA proposals that may be submitted to NMFS, but they are likely to be similar in some respects.

2.2.2.1 Overview of the Financial Incentive Plan

The FIP was developed by the At-sea Processors Association, which represents 19 of the 20 AFA qualified CPs.[5] The FIP was developed in March 2009 prior to the Council's action on Amendment 91, and therefore the description uses somewhat different terms and definitions than Amendment 91. The description is provided here as a frame of reference for how IPAs may be developed in the future under Amendment 91. The FIP as proposed consists of three basic components:

1) Rolling Hot Spot Closure Program (RHS);
2) Tradable Bycatch Allowances;
3) Bycatch Avoidance Competition (BAC)

A modified version of the tradeable Chinook PSC allowances component is found in the SSIP. The BAC is unique to the FIP.

Rolling Hot Spot Closure Program

The RHS included in the FIP is, in theory, very similar to the program proposed in the SSIP and is modeled after the VHRS ICA used by both CPs and CVs in 2008. The two rolling hot spot programs will be administered separately with two exclusive sets of data, and with closed areas and excluded boats based on bycatch rates within each particular program.

[4] Although the regulatory establishment of the VRHS ICA is removed by Amendment 91, participants in the fisheries can develop Rolling Hot Spot Closures (RHS), as a part of an IPA.

[5] The Ocean Peace—a CP that is technically qualified to target pollock in the BS is not a member of the At-Sea Processors association and it is not clear how they would interact with this program.

It is assumed the independent monitor of the RHS[6] would track Chinook PSC rates on a real time basis in discrete geographic areas and would report Chinook PSC rates in each area to all FIP participants. The RHS would also define closed areas in locations where Chinook PSC rates have been particularly high. Vessels with Chinook PSC rates exceeding an "exclusion rate" will be prohibited from participating in the closed area. In the FIP, the exclusion rate is equal to the median Chinook PSC rate of vessels participating in the FIP.

Tradable Bycatch Allowance Program

The second component of the FIP was a Tradable Bycatch Allowance Program, in which participants in the FIP will be allocated a share of the overall Chinook PSC cap. In the FIP, the Chinook PSC allowances would have been allocated at the company level (as opposed to the vessel level). The Chinook PSC allowances for a given participating company (TBA_C) would be equal to:

$TBA_C = (P_C \div P_{BS}) \times S$; where

- P_C is the total AFA pollock allocated to the company and the total CDQ pollock for which the company is contracted to harvest;
- P_{BS} is the BS pollock TAC exclusive of the 4% of the TAC set aside for incidental catch in other BS target fisheries.
- S is the total salmon cap allowed. The FIP assumed the S was equal to 68,392 salmon, since this higher amount was the *raison d'être* for the FIP. (*Note: If the FIP were implemented under the Amendment 91, S would be equal to 60,000.)*

Specific allocations to vessels within each company will be determined by the companies themselves. It was presumed that companies and vessels would use the Chinook PSC allowances to generate a market for Chinook PSC allowances among companies and vessels in the program. Companies that had higher Chinook PSC would need to acquire additional allowances from companies and vessels that had lower Chinook PSC. The individual incentive for keeping Chinook PSC low, particularly in high abundance years, is the cost of acquiring additional allowances. However, if abundance of Chinook on the grounds is low, the market cost of Chinook PSC allowances will likely be low and the financial incentive to avoid additional Chinook PSC may be low. For this reason the FIP included an additional competition to avoid Chinook PSC.

Bycatch Avoidance Competition

The BAC is unique to the FIP, and is designed as a means of providing additional incentives to keep Chinook PSC low, if there are relatively low numbers of salmon on the fishing grounds. The BAC program assesses a fee of $0.01 for every pound of pollock harvested by FIP participants, which is aggregated into a BAC pool. The BAC pool is then redistributed to FIP participants at the end of the year based on each individual vessel's Chinook PSC performance (number of Chinook PSC per metric ton (mt) of pollock) relative to a reference point. The Bycatch Reference Rate (BRR) is established by the FIP at 2.5 times the median Chinook PSC performance of FIP vessels during the year. Vessels that catch Chinook PSC at a rate lower than the BRR will receive payment back from the BAC pool in proportion to their undercatch—a proxy for avoided Chinook PSC. Vessels with a higher rate than the BRR pay additional penalty fees to the BAC pool in proportion to their overcatch—a proxy for Chinook PSC that should have been avoided but were not.

As an additional incentive, the BAC included a Sector Performance Standard that applies company-wide Chinook PSC rates, and is designed to keep Chinook PSC below the 47,591 cap level. Companies whose

[6] Similar programs have been monitored in the past by Sea State, Inc. of Seattle WA. It is presumed that Sea State, Inc. will also be involved as the monitoring organization for the FIP RHS.

fleet-wide three-year rolling average of Chinook PSC exceeds levels that would have been allowed if the cap were set at 47,591 (rather than at 68,392), will be penalized by paying an additional ½ of 1 cent per pound of pollock into the BAC for each year. If the company's three-year average of Chinook PSC exceeds the lower cap level two years in a row, they pay $0.02 per pound of pollock into the BAC in the following year—$0.01 in penalties and $0.01 as the standard fee.

2.2.2.2 Overview of the Salmon Savings Incentive Plan

The SSIP was proposed by United Catcher Boats, an organization that represents the majority of the AFA qualified catcher vessels. The SSIP was developed in March 2009, prior to the Council's action on Amendment 91, and therefore the description uses somewhat different terms and definitions than Amendment 91. The description is provided here as a frame of reference for how IPAs may be developed in the future under Amendment 91. The SSIP as proposed consists of two basic components:

1) Rolling Hot Spot Closure Program (RHS);
2) Salmon Savings Incentives Plan

Rolling Hot Spot Closure

The RHS included in the SSIP is similar to the program proposed in the FIP and is modeled after the program used by both CPs and CVs in 2008. The independent monitor of the RHS[7] would track Chinook PSC rates on a real-time basis in discrete geographic areas and report Chinook PSC rates in each area to all SSIP participants in the RHS. The RHS would also define closed areas in locations where Chinook PSC rates have been particularly high. Vessels with Chinook PSC rates exceeding an "exclusion rate" will be prohibited from participating in the closed area. In the SSIP, vessels are excluded from closed areas if their individual Chinook PSC rates exceed 75 percent of the rolling three-week average of Chinook PSC of SSIP participants.

Salmon Savings Incentive Plan

The SSIP combines elements of a tradable Chinook PSC allowance program with a multi-year salmon savings account. At the beginning of each year, each participant is given an individual base cap (IBC) of Chinook PSC allowances that is proportional to the amount of pollock they are allocated. The total amount of Chinook PSC allocated to SSIP participants is that portion of the performance standard (47,951 salmon) equal to the portion of the BS pollock TAC[8] allocated to SSIP participants.

Participants in the SSIP can trade the Chinook PSC allowances in their individual base caps similarly to the way the Chinook PSC allowances are traded in the FIP. However, a key element of the SSIP is that participants who catch less than their individual base cap can save the unused portions of their individual base cap from one year and use it in later year for up to three years. However, the unused portions are discounted for use in future years by multiplying the unused allowances by 43.71 percent.[9] Allowances that are "saved" cannot be transferred to another vessel, but are available in any of the next three years, to the originating vessel, if the vessel exceeds its individual base cap in catching its own pollock allocation. These "saved" allowances cannot be transferred to another vessel, but can be used to harvest another

[7] Sea State Inc. has been the monitor of the VRHS ICA program utilized in 2008. If the SSIP based VRHS ICA and the FIP based RHS are indeed separate but similar programs, it is possible that the same independent monitor could be used. It is not clear whether the two programs would be sharing data, or if there would be conflicts of interest if a single monitor was used for both programs.

[8] After setting aside 4% of the pollock TAC for incidental catches of pollock in other groundfish fisheries.

[9] This is the difference between the Performance Standard (47,591) and the Hard Cap (68,392) as a% of the Performance Standard, i.e. (47,591 – 68,392) ÷ 47,591 = 43.71% *(Note that the "Hard Cap" under Amendment 91 would be set to 60,000.)*

vessel's pollock in future years. A vessel's saved allowances cannot be used by that vessel, if the vessel owner has transferred any of its individual base cap for that year.

There are a number of other technical rules and restrictions regarding transfers that are beyond the scope of this analysis. However, if a vessel owner wishes to make use of the unused individual base cap in the current year it can:

- Acquire additional pollock from another owner .
- Transfer its unused Chinook PSC allowances to another owner in the SSIP. If the new owner does not use all of this acquired individual base cap, the original owner is credited with the savings.
- Transfer both pollock and an amount of individual base cap that is less than or equal to the proportion of individual base cap to pollock in that year.
- Transfer its individual base cap to a participant in the FIP. Transfers of individual base cap into the FIP could be used in exactly the same manner as any number of Chinook PSC allowances.

2.2.3 Overview of the BSAI Pollock Fishery

The BSAI pollock fishery was rationalized by the American Fisheries Act (AFA), which was approved by the US Congress in October of 1998. Fishing under the AFA began in 1999 with full participation by all sectors beginning in 2000. In general, rationalization of the pollock fishery was accomplished by three sets of provisions:

1) AFA allocated the BSAI Pollock TAC available for directed fishing to four sectors as follows:
    - CDQs: 10%
    - Inshore: 45%
    - Catcher/Processors: 35%
    - Motherships: 9%

2) AFA created an exclusive set of vessels that are allowed to target BSAI pollock, including 111 catcher vessels and 20 catcher processors.

3) AFA established a process by which harvesting vessels within specific sectors may form cooperatives.

2.2.3.1 History of the BSAI Pollock Fishery Prior to AFA

From 1954 to 1963, pollock were harvested at low levels in the Eastern Bering Sea and directed foreign fisheries began in 1964. Catches increased rapidly during the late 1960s and reached a peak in 1970 to 1975, when they ranged from 1.3 million to 1.9 million tons annually. Following a peak catch of 1.9 million tons in 1972, catches were reduced through bilateral agreements with Japan and the USSR. Figure 1 shows total BSAI harvests from 1964 through 2007.

Since 1977, when the U.S. EEZ was established, the average annual Eastern Bering Sea pollock catch has been 1.2 million tons, and has ranged from 0.9 million tons in 1987 to nearly 1.5 million tons in recent years. Stock biomass has ranged from a low of 4 million to 5 million tons to highs of 10 million to 12 million tons (Figure 1). United States vessels began fishing for pollock in 1980, and by 1987 harvested 99% of the quota. Since 1988, only U.S. vessels have been operating in this fishery. By 1991, the current NMFS observer program for North Pacific groundfish fisheries was in place.

Foreign vessels began fishing in the mid-1980s in the international zone of the Bering Sea (commonly referred to as the "Donut Hole"). The Donut Hole is entirely contained in the deep water of the Aleutian

Basin and is distinct from the customary areas of pollock fisheries, namely the continental shelves and slopes. Japanese scientists began reporting the presence of large quantities of pollock in the Aleutian Basin in the mid-to-late 1970s, but large-scale fisheries did not occur until the mid-1980s. In 1984, the Donut Hole catch was only 181 thousand tons. The catch grew rapidly and by 1987, the high seas pollock catch exceeded the catch within the U.S. Bering Sea EEZ. The extra-EEZ catch peaked in 1989 at 1.45 million tons and has declined sharply since then. By 1991 the Donut Hole catch was 80% less than the peak catch, and data for 1992 and 1993 indicate very low catches. A fishing moratorium was enacted in 1993 and only trace amounts of pollock have been harvested from the Aleutian Basin by resource assessment fisheries.

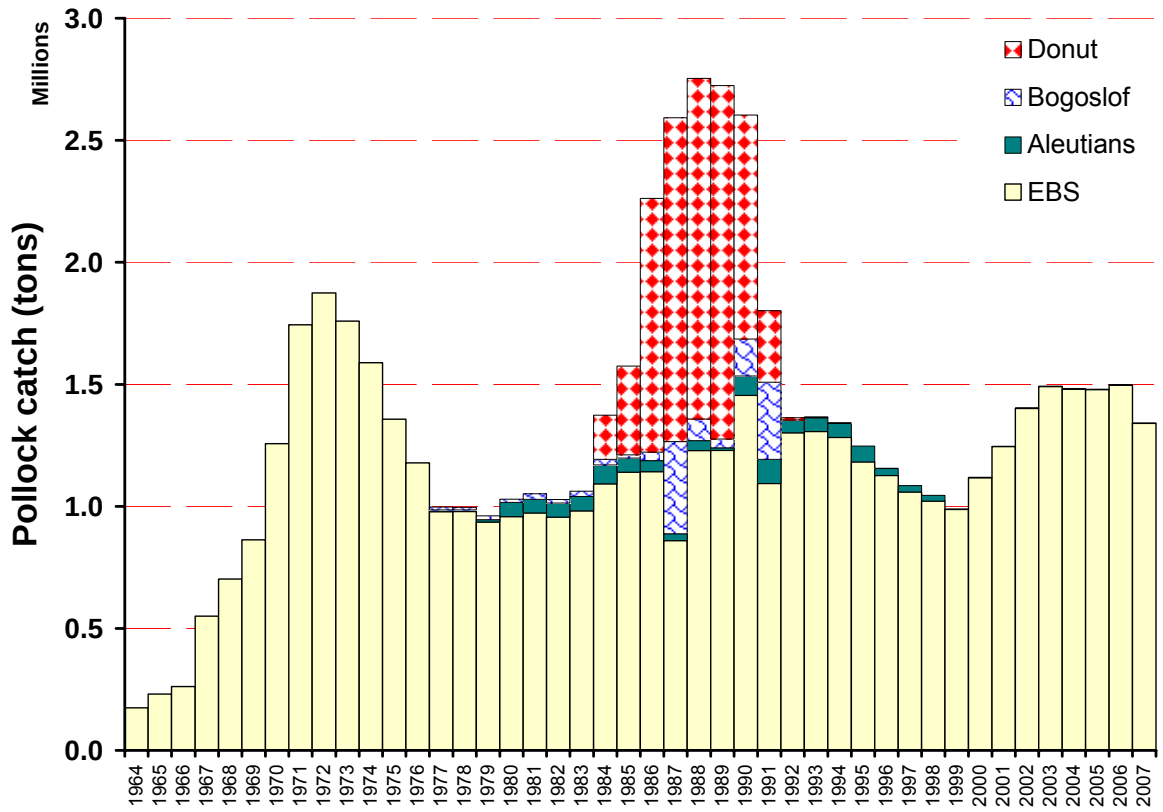

Figure 1. Alaska pollock catch estimates from the Eastern Bering Sea, Aleutian Islands, Bogoslof Island, and Donut Hole regions, 1964-2007

2.2.3.2 The Pollock Fishery Since AFA

This section provides an overview of the pollock fishery from 2003 forward. The majority of the information is taken from tables and figures provided in the Council Draft of the Regulatory Impact Review (RIR) for Amendment 91 (Council, 2009). In addition, some of the figures are taken from the "Alaska Groundfish Market Profiles" (Northern Economics 2008) which is included in the "Economic Status of the Groundfish Fishery off Alaska, 2007" (Hiatt, 2008). The overview is divided into three sub-sections that describe: (1) participation, harvests, and value; (2) pollock products and production amounts; and (3) seasonality in the pollock fishery.

Participation, Harvests, and Value in the BS Pollock Fishery

Table 1 summarizes participation and harvests in the Bering Sea (BS) pollock fishery from 2003 to 2007. The number of harvesting vessels (CVs or CPs) participating in the fishery has declined since implementation of AFA from 131 vessels to 109 vessels in 2007—four authorized CPs and seventeen

authorized CVs are no longer participating in directed pollock fisheries in the BS. Over the five years shown, harvests have averaged over 1.4 million mt, In 2008 and 2009, both allocations and harvests were lower—the total directed fishing allocation of BS pollock for 2008 fell to 968,500 mt, and in 2009 it fell again to 785,700 mt. Ex-vessel value is the amount of revenues that CVs receive from processors (shore plants or motherships). From 2003 through 2007, total ex-vessel value averaged $197 million. Wholesale value is the amount that processors receive for processed products. Estimates shown for CVs represent the wholesale product value for shore plants that processed BSAI pollock. The average of total annual wholesale value from 2003 to 2007 was $1.21 billion. Industry sources indicate that in 2008 both ex-vessel and wholesale prices were significantly higher than they had been in 2007. In 2009 ex-vessel and wholesale price have declined from 2008 levels.

Table 1. Summary of Bering Sea Pollock Harvesting Vessels, Allocations, Harvests and Value 2003 - 2007

Year	Sector	Vessels No.	Pollock Allocation 1,000 MT	Pollock Catch 1,000 MT	Ex-Vessel Value $ Millions	Wholesale Value $ Millions
2003	CV (86)	86	653	652	152	403
	CP (16)	16	522	522	NA	378
	M (10)	10	131	131	31	69
	CDQ	*	149	149	NA	108
	Total	**112**	**1,455**	**1,454**	**183**	**957**
2004	CV (86)	86	650	638	148	430
	CP (17)	17	520	520	NA	420
	M (10)	10	130	129	30	76
	CDQ	*	149	149	NA	121
	Total	**113**	**1,448**	**1,436**	**177**	**1,046**
2005	CV (84)	84	654	648	177	523
	CP (16)	16	523	518	NA	493
	M (9)	9	131	131	36	57
	CDQ	*	150	150	NA	142
	Total	**109**	**1,457**	**1,446**	**212**	**1,215**
2006	CV (81)	81	660	646	180	510
	CP (16)	16	528	527	NA	478
	M (9)	9	132	131	37	92
	CDQ	*	150	150	NA	136
	Total	**106**	**1,471**	**1,455**	**217**	**1,217**
2007	CV (82)	82	611	573	161	449
	CP (16)	16	489	489	NA	487
	M (11)	11	122	122	34	93
	CDQ	*	139	139	NA	139
	Total	**109**	**1,361**	**1,322**	**195**	**1,168**

Sources: Vessel counts, allocations and harvests from Table 10-3 in Council, 2009, ex-vessel and wholesale value estimated from Hiatt, 2008.

Notes:

(1) The table does not include information from the AI pollock fishery.

(2) There are 19 CVs that are members of the Mothership Fishing Cooperative (MFC), many of which fish in other shorebased coops. The tables list only MFC CVs that were not already counted among the shorebased CVs.

(3) Ex-vessel values are not estimated for pollock harvest CPs of CDQs because CPs process their own fish and no ex-vessel transaction occurs. Similarly CDQ harvests of pollock are nearly always made by CPs and therefore of ex-vessel value from the CDQ fishery are not calculated.

Figure 2 shows the relative stability of pollock harvests by sector from 2003 to 2007 and the slight decline seen in 2007. The 2007 season was a harbinger for further declines that took place in 2008 and 2009. Figure 3 shows increasing total wholesale values, which were driven by significantly higher prices per ton.

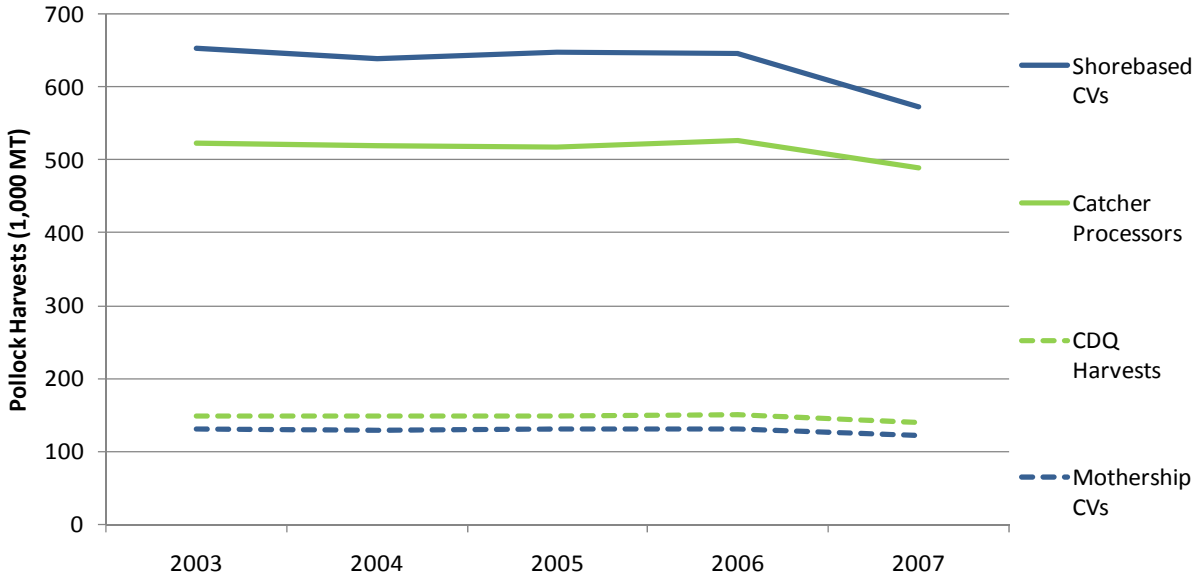

Figure 2. Pollock Harvests by Sector in the Bering Sea, 2003 – 2007
Source: Developed by Northern Economics from data in Table 10-3 of NFPMC 2009.

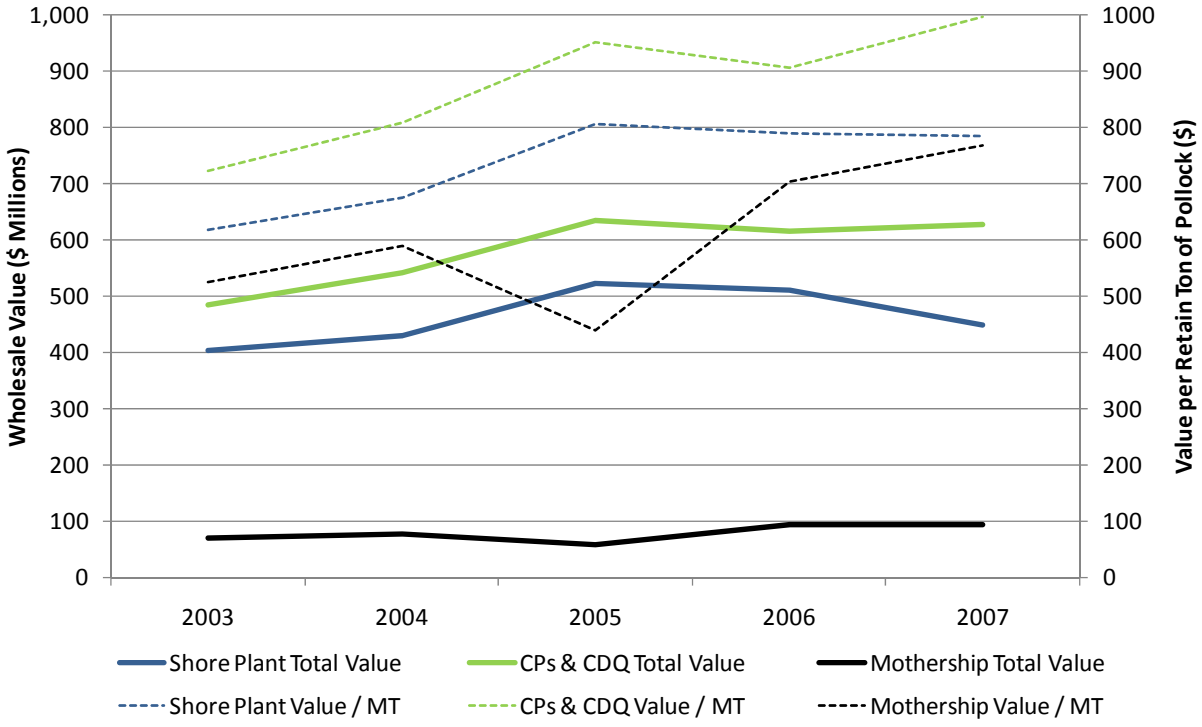

Figure 3. Total Wholesale Value of Pollock and Wholesale Value per Ton by Sector, 2003 – 2007
Source: Developed by Northern Economics from data in Table 10-3 of NFPMC 2009 and Hiatt, 2008.

Pollock Products and Production Amounts

The pollock fishery in waters off Alaska is the largest U.S. fishery by volume, and the economic character of that fishery is based on a varied range of products produced from pollock. In the U.S., Alaska pollock catches are processed mainly for roe, surimi, and several varieties of fillet products. Fillet production has increased particularly rapidly due to more efficient harvest rates, increased recovery rates, and the shift by processors from surimi to fillet production, all made possible, at least in part, by the AFA. The information in this section summarizes the more extensive information presented in "Alaska Groundfish Market Profiles" (Northern Economics, 2008) which is included in the "Economic Status of the Groundfish Fishery off Alaska, 2007" (Hiatt, 2008). Both of these reports are incorporated by reference and are referred to the documents for more detailed discussions.

Prior to the implementation of the AFA, U.S. pollock catches were processed mainly into surimi. The Bering Sea pollock fishery was then managed as an "open-access" fishery in which vessels sought to harvest as large a share of the TAC as possible before the TAC or established bycatch limits were reached and the fishery closed. Because surimi production allows more raw material to be processed in a shorter period of time than fillet and fillet block production, committing catches for surimi production was to a vessel's operational advantage. With the operational and economic efficiencies gained through rationalization of the fishery under the AFA, the industry was able to abandon practices compelled by the economics of open access and began developing more deliberate production strategies according to market demands.

This shift in production practices led, as noted, primarily to a particularly rapid increase in fillet production during the early 2000s to meet greater world demand for whitefish products created by several factors, including declining harvests in the Russian pollock fishery and a sharp decrease in the supply of fillets from Atlantic cod. The result has been increased fillet production and growth in wholesale gross revenues from U.S. pollock fillet production.

Figure 4 shows the Alaskan production of pollock by product from 1996 to 2007. Figure 5 shows the estimated wholesale value of these products over the same period. These figures show the dramatic increase in production and wholesale value of fillets from 2000 to the present, as well as the importance of roe particularly given roe product value compared to roe production.

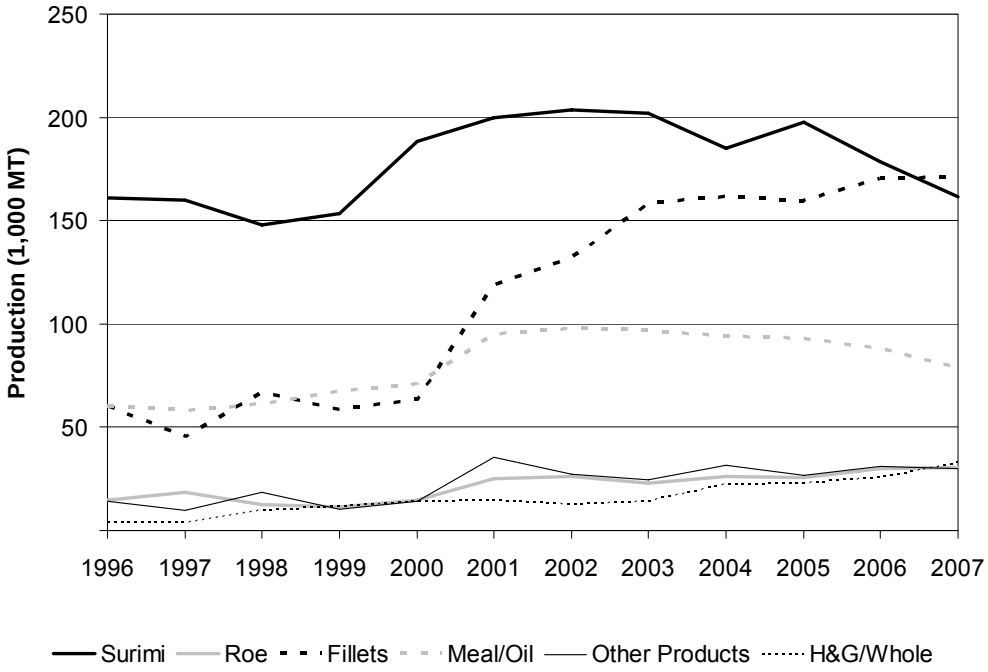

Figure 4. Alaska Primary Production of Pollock by Product Type, 1996-2005
Source: Northern Economics, 2008
Note: Product types may include several more specific products.

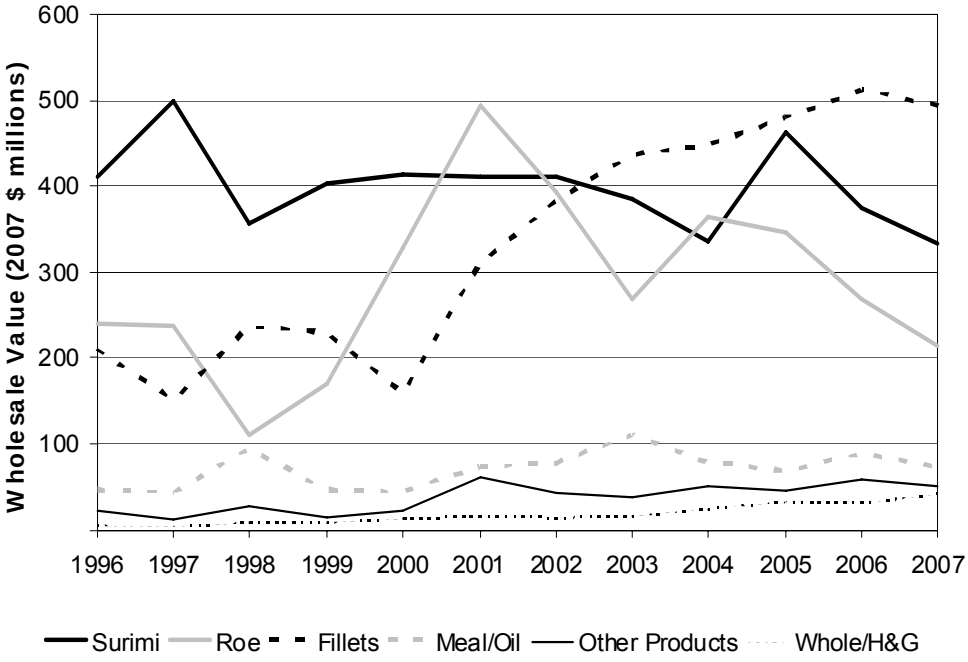

Figure 5. Wholesale Value of Alaska Primary Alaska Pollock Production by Product Type, 1996 – 2007
Source: Northern Economics 2008
Note: Product types may include several more specific products.

Seasonality in the BS Pollock Fishery

The BS pollock fishery is divided into two seasons: 40% of the total directed fishing allowance (DFA) is apportioned to the A Season, which is open from January 20 through June 10, and 60% of the DFA is apportioned to the B Season, which is open from June 10 – November 1. Typically, fishing in the A Season ends in April, while fishing in the B Season usually begins in July and runs through the end of October. The A Season fishery has historically focused on roe-bearing females, and is concentrated north and west of Unimak Island and along the 100-meter contour between Unimak and the Pribilof Islands. A Season pollock also provide other primary products such as surimi and fillet blocks, but yields on these products are slightly lower than during later periods of the B Season. The B Season fishery generally takes place west of 170°W. During the early months of the B Season (June in particular), flesh quality of pollock may still be compromised because the fish have not fully recovered from spawning.

Table 2. Pollock Harvest by Season, 2000 - 2007

Year	A Season	B Season	Full year
2000	418,285	631,755	1,050,039
2001	538,107	813,022	1,351,130
2002	570,464	866,034	1,436,498
2003	576,868	876,784	1,453,651
2004	579,816	858,799	1,438,615
2005	573,887	878,618	1,452,505
2006	579,112	874,435	1,453,547
2007	544,273	775,261	1,319,534

Source: Table 10 – 5 of Council, 2009

Table 3 illustrates the importance of the A Season and the additional value that pollock roe brings to the fishery. Notwithstanding the fact that A Season harvests are only 2/3^{rds} that of the B Season, total value produced in the A Season has exceeded total value in the B Season for both the catcher processors and motherships. This is not the case for shore plants, where total value in the A Season has been less than total value in the B Season.

Table 3. Wholesale Value of Pollock by Sector and Season, 2004 - 2006

		2003	2004	2005	2006	2003	2004	2005	2006
Sector	Season	$ per MT of Retained Pollock				Total Wholesale Value ($Millions)			
CP	A	971	1141	1246	1170	261.7	312.1	339.7	321.8
	B	567	591	767	748	228.3	234.2	306.5	301.5
	Total	**729**	**816**	**962**	**919**	**490.0**	**546.2**	**646.3**	**623.3**
M	A	708	844	612	980	42.6	50.8	35.3	56.9
	B	414	425	333	546	37.8	38.2	29.6	48.8
	Total	**531**	**593**	**443**	**717**	**80.4**	**89.0**	**64.9**	**105.8**
S	A	797	849	1018	947	206.3	220.9	262.4	249.2
	B	633	596	700	700	249.3	225.4	273.6	268.6
	Total	**698**	**699**	**827**	**526**	**455.6**	**446.3**	**535.9**	**340.5**
All	A	867	983	1084	1053	510.6	583.8	637.4	627.9
	B	581	576	694	706	515.4	497.8	609.7	619.0
	Total	**695**	**742**	**850**	**726**	**1026.0**	**1081.6**	**1247.2**	**1246.9**

Source: Adapted by Northern Economics from Table 10-80 and 10-82 of Council, 2009.

The lower overall wholesale values received by pollock shore plants in the A Season (shown in Table 3) can be largely explained by the differences among processing modes in the value received for roe. Table 4 shows that on average, roe values per product pound of shoreside processors are 28% less than the roe values received by at-sea processors. For the other products listed, the average differentials between shoreside values and at-sea values range from 12% for surimi and fishmeal to 0% for other fillets. According to industry sources, at-sea processors receive higher values for roe in part because they are able to process it much sooner after pollock are harvested, and because they have somewhat greater flexibility in the areas in which they can fish.

Table 4. Wholesale Value per Product Pound for Pollock by Processing Mode, 2003 - 2007

	2003		2004		2005		2006		2007	
	At-sea	Shore-side	At-sea	Shore-side	At-sea	Shore-side	At-sea	Shore-side	At-sea	Shore-side
Product	**$ per Product Pound**									
Roe	6.12	4.31	6.68	4.91	6.77	5.42	5.09	3.62	4.61	3.07
Deep-skin Fillets	1.15	1.11	1.21	1.04	1.25	-	1.35	1.22	1.46	1.25
Other Fillets	0.85	0.94	0.97	0.94	1.12	1.12	1.25	1.22	1.25	1.23
Surimi	0.71	0.70	0.75	0.66	1.03	0.90	1.01	0.84	1.08	0.88
Fish Meal	0.35	0.34	0.37	0.33	0.38	0.32	0.52	0.46	0.53	0.44
Weighted Average	**1.03**	**0.86**	**1.16**	**0.87**	**1.28**	**1.00**	**1.28**	**1.00**	**1.29**	**1.06**

Source: Adapted by Northern Economics from Table 26 in Hiatt, 2008.

2.2.4 Summary of Historical Chinook Bycatch in the BS Pollock Fishery

This section provides a summary of historic levels of Chinook bycatch in the BS pollock fishery. Chinook bycatch has varied across years, seasons, sectors, and areas. The section describes these differences very briefly—additional detail can be found in the DEIS (Council, 2009).

Table 5 provides a summary of Chinook bycatch by season in the BS pollock fishery from 2000 through 2007. In general, bycatch of Chinook has increased during this period. Bycatch rates in the A Season have been higher in most years than in the B Season. However, there have been exceptions—in 2004 and 2005 Chinook bycatch in the B Season exceeded bycatch in the A Season. Bycatch rates as measured by Chinook per mt of pollock have also been lower in the B Season—rates in 2005 are an exception.

Table 5. Pollock Harvests and Chinook Bycatch by Season, 2000 - 2007

	Pollock Harvests			Chinook Bycatch			Chinook Bycatch Rates		
	A Season	B Season	Full year	A Season	B Season	Full year	A Season	B Season	Full year
Year	**(1,000 MT)**			**(1,000 Chinook)**			**(Chinook / Pollock MT)**		
2000	418.3	631.8	1,050.0	3	2	5	0.008	0.003	0.005
2001	538.1	813.0	1,351.1	16	14	30	0.031	0.017	0.022
2002	570.5	866.0	1,436.5	22	13	35	0.039	0.015	0.025
2003	576.9	876.8	1,453.7	31	13	44	0.054	0.015	0.031
2004	579.8	858.8	1,438.6	22	29	51	0.038	0.034	0.036
2005	573.9	878.6	1,452.5	27	41	68	0.046	0.047	0.047
2006	579.1	874.4	1,453.5	58	24	82	0.100	0.027	0.056
2007	544.3	775.3	1,319.5	71	49	120	0.130	0.063	0.091

Source: Adapted by Northern Economics from Haflinger, 2008.

Figure 6 summarizes the data from Table 5. In the figure, pollock harvests (shown with solid lines), are indicated on the left axis, and salmon bycatch levels (shown with dashed lines) are indicated on right axis. Both pollock harvests and Chinook bycatch increased from 2000 to 2002. Pollock harvests were flat from

2002 to 2006, but Chinook bycatch continued to increase. In 2007, Chinook bycatch rose sharply while pollock harvests declined. Figure 6 also shows seasonal differences in Chinook bycatch levels. In all years, B Season bycatch levels were lower than A Season levels, with the exception of 2004 and 2005.

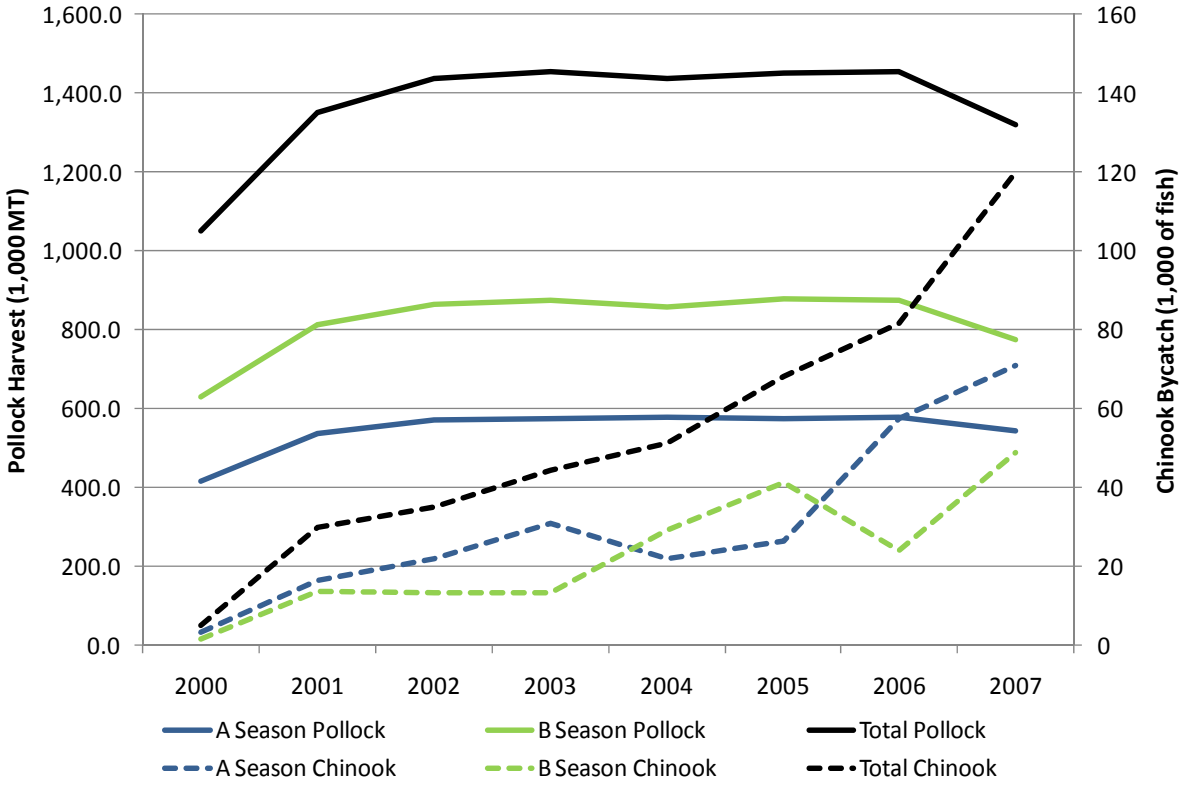

Figure 6. Comparison of Pollock Harvests with Bycatch of Chinook by Season, 2000 – 2007.
Source: Figure developed by Northern Economics from data in Haflinger, 2008.

Explaining the variation in salmon bycatch levels in the BS pollock fishery is complicated, because it depends on the time period that is analyzed. For example, it might appear from Figure 6 that Chinook bycatch increased from very low levels prior to 2001 to the relatively high levels seen in 2007. In fact, as seen in Figure 7, Chinook bycatch numbers were highly variable from 1991 to 1999, ranging from 63,000 in 1996 to 14,000 in 1999. The figures also show Chinook bycatch in 2008 and in 2009 through August 6. In 2008, Chinook bycatch in the BS pollock fishery dropped to 20,000, and through August 6, 2009 Chinook bycatch was 10,000.

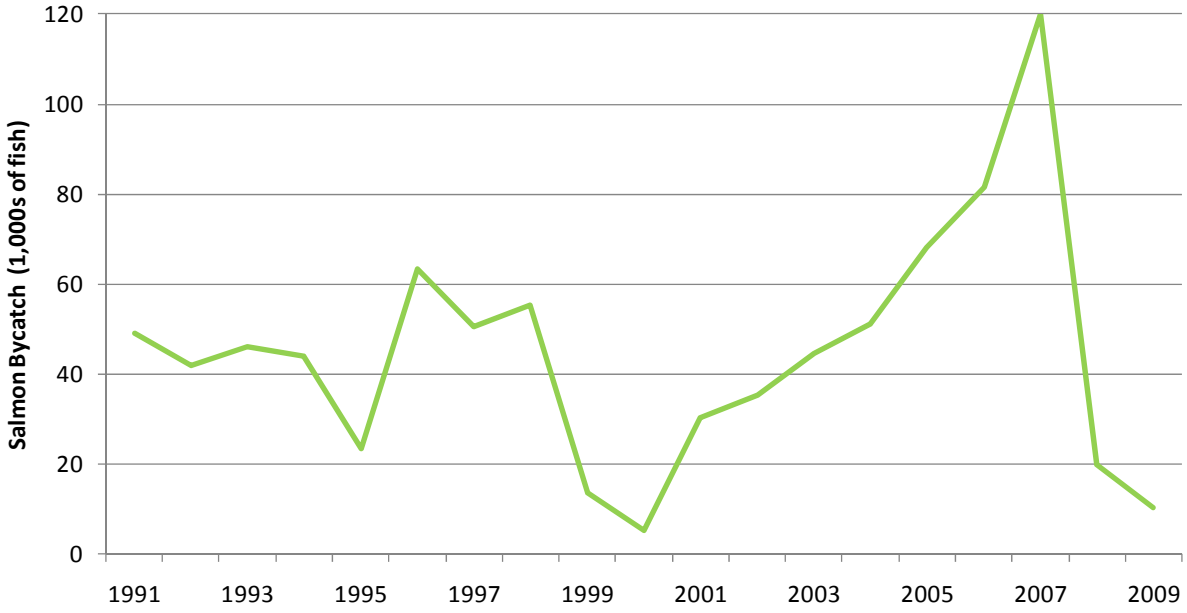

Figure 7. Bycatch of Chinook Salmon in the BS Pollock Fishery, 1991 – 2007.
Source: Developed by Northern Economics from data in Haflinger, 2008, and NMFS-AKR, 2009.
Note: Bycatch for 2009 is incomplete but current through August 6, 2009.

Chinook bycatch in the BS pollock fishery also varies by sector. As shown in Figure 8, Chinook bycatch rates by the offshore sectors (motherships and catcher processors) have been generally lower than Chinook bycatch rates by the inshore sector. This is particularly true in the B season when the offshore fishery tends to fish much farther to north and west than the inshore fleet.

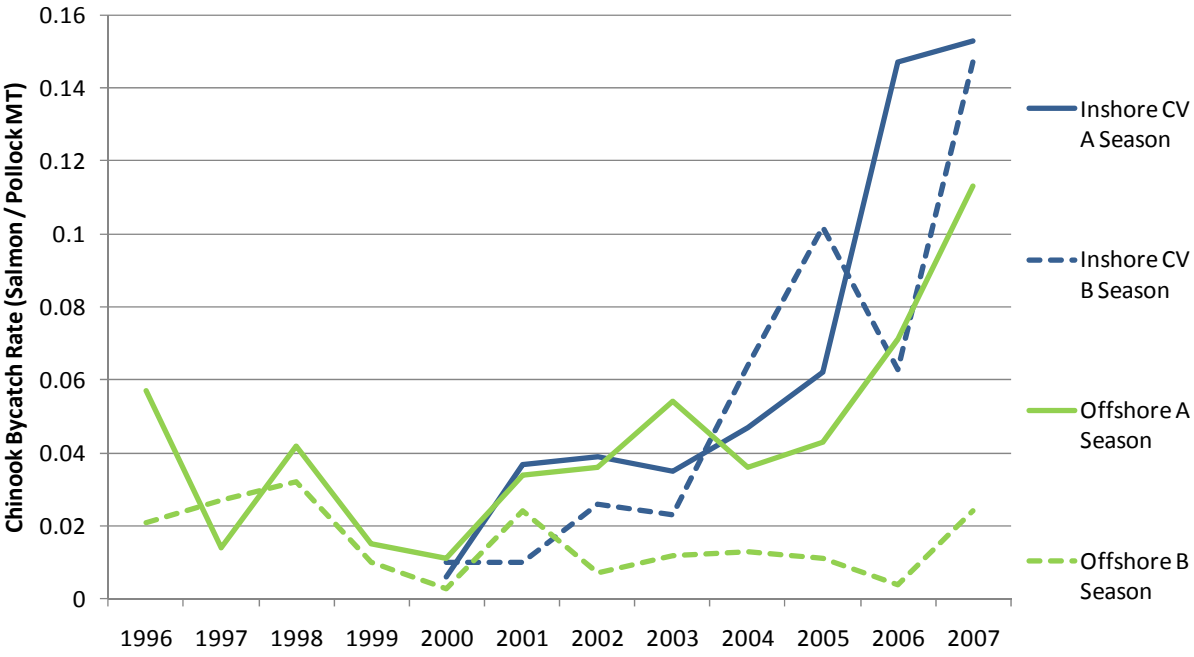

Figure 8. Bycatch Rates of Chinook Salmon in the BS Pollock Fishery by Sector, 1996 – 2007.
Source: Developed by Northern Economics from data in Haflinger, 2008.

Chinook bycatch in the BS pollock fishery has been highly variable by month. As shown in Figure 9 and Figure 10, bycatch has been highest in January, February and October and lowest during June through August. Bycatch rates are much higher in October than in January or February, but total harvest in the pollock fishery during February is twice the total harvest in October.

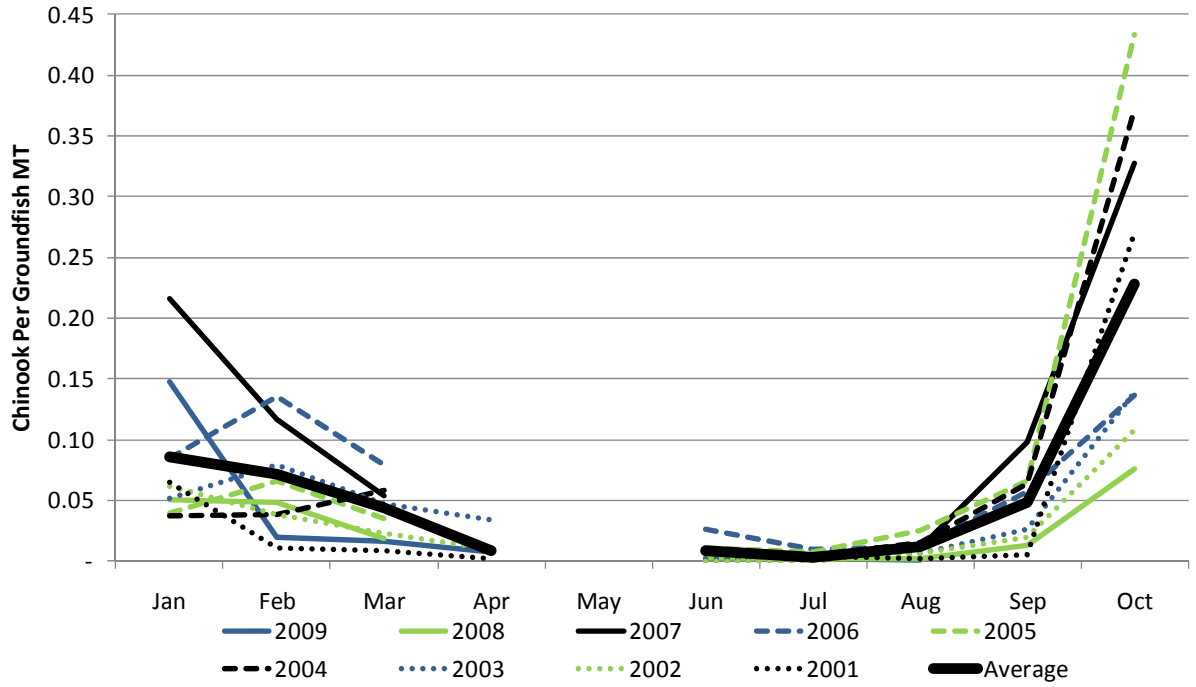

Figure 9. Bycatch Rates of Chinook Salmon in the BS Pollock Fishery by Month, 2001 – 2007
Source: Developed by Northern Economics from NMFS-AKR, 2009.

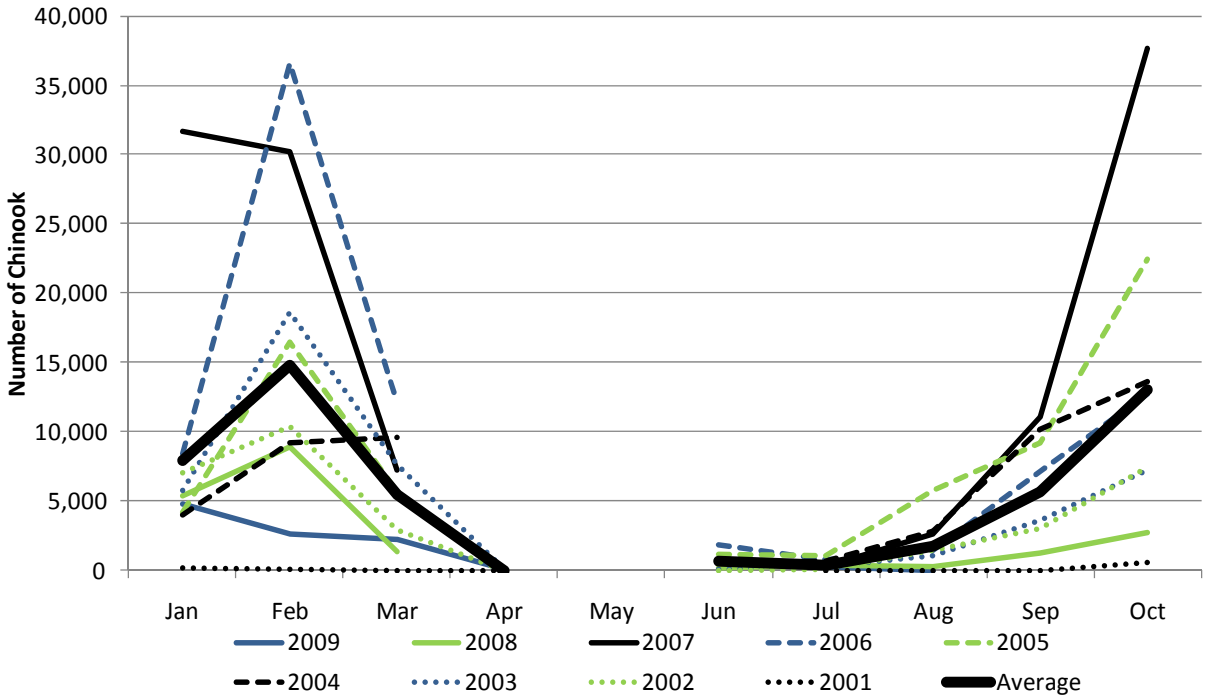

Figure 10. Total Bycatch Chinook Salmon in the BS Pollock Fishery by Month, 2001 – 2009
Source: Developed by Northern Economics from NMFS-AKR, 2009.

Chinook bycatch rates also vary by location of fishing effort. During the A Season, bycatch rates have been highest in areas west of 165˚W and south of 55˚N in a 15 × 45 nm area known in the industry as the "east-west tow of the horseshoe." In Figure 11, the areas with highest average historic bycatch rates (0.4 or more salmon per mt of pollock) are shown in darkly shaded squares (dark blue if viewing in color). Areas farther to the north generally have lower bycatch rates.

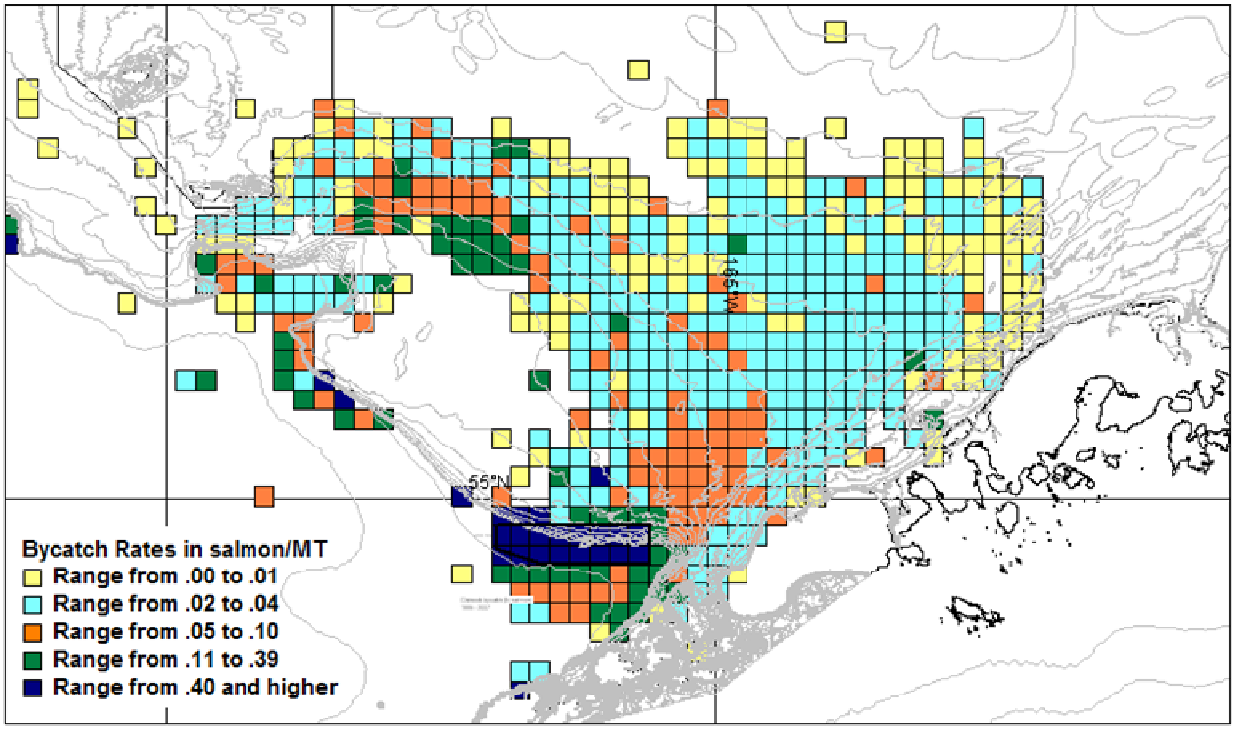

Figure 11. Bycatch Rates of Chinook Salmon in the BS Pollock Fishery A Season by Area, 1995 – 2007.
Source: Figure adapted by Northern Economics from Haflinger, 2008.

As shown in Figure 11, Chinook bycatch rates during the A season from 1995 through 2007 were highly variable across areas. Bycatch rates are also highly variable across hauls. Table 6 shows summary statistics calculated from vessel-specific bycatch rates in the 2008 BSAI pollock fishery, in which nearly 12,000 hauls were sampled. These sampled hauls accounted for 16,151 Chinook. The estimate of total Chinook bycatch in the 2008 BS pollock fishery was 20,499. The distribution of bycatch is highly skewed—a total of 4,732 or 40% of the sampled hauls had zero bycatch. The average over all sampled hauls was 1.35 Chinook per haul, and as further evidence of the skewed nature the distribution, the mean corresponds to the 81st%ile of hauls. The standard deviation is 5.6 Chinook per haul, which is more than four times the observed bycatch rate.

Table 6. Chinook Bycatch Statistics from Observer Sampled Hauls in 2008

Total Chinook Estimated from Sample Hauls	Total No. of Hauls Sampled	Sampled Hauls with Zero Chinook	Mean	Percentile of Mean	Max	95th Percentile	Standard Deviation
			Chinook per Haul				
16,151	11,928	4,732	1.354	81st	232.0	6.333	5.638

Source: Developed by Northern Economics from Vessel Specific Bycatch Rates for 2008 in NMFS-AKR 2009.
Note: Actual data show sampled hauls per week by vessel. Estimates are calculated by weighting the bycatch rate per sampled hauls for the week by the number of sampled hauls in the week.

Figure 12 shows the cumulative distribution of Chinook bycatch in sampled hauls during 2008. The figure shows that 60% of the Chinook bycatch for the year was taken in only 6% of the hauls and 80% of the bycatch is from 15% of the hauls.

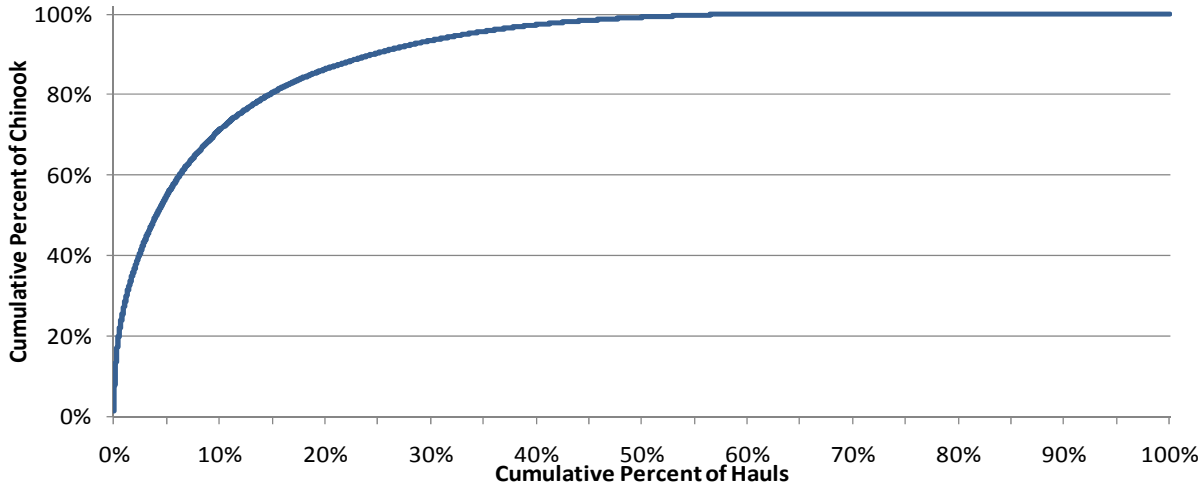

Figure 12. Cumulative Distribution of Chinook Bycatch in the BS Pollock by Haul, 2008
Source: Developed by Northern Economics from NMFS-AKR 2009.

Vessel-specific Chinook bycatch data for the BSAI pollock fishery are reported by NMFS-AKR on the internet (NMFS-AKR, 2009) for 2008 and 2009 only. However, vessel-specific bycatch rates for other PSC species in the BSAI pollock fishery have been reported since 2003. These data are summarized in Figure 13 to show counts of sampled hauls by year and the average groundfish harvest per sampled haul in the BS pollock fishery. The number of sampled hauls was relatively stable from 2003 to 2007, but dropped sharply with the BSAI pollock TAC reduction in 2008. Average groundfish catch per haul has remained between 75 and 85 mt/haul throughout the period.

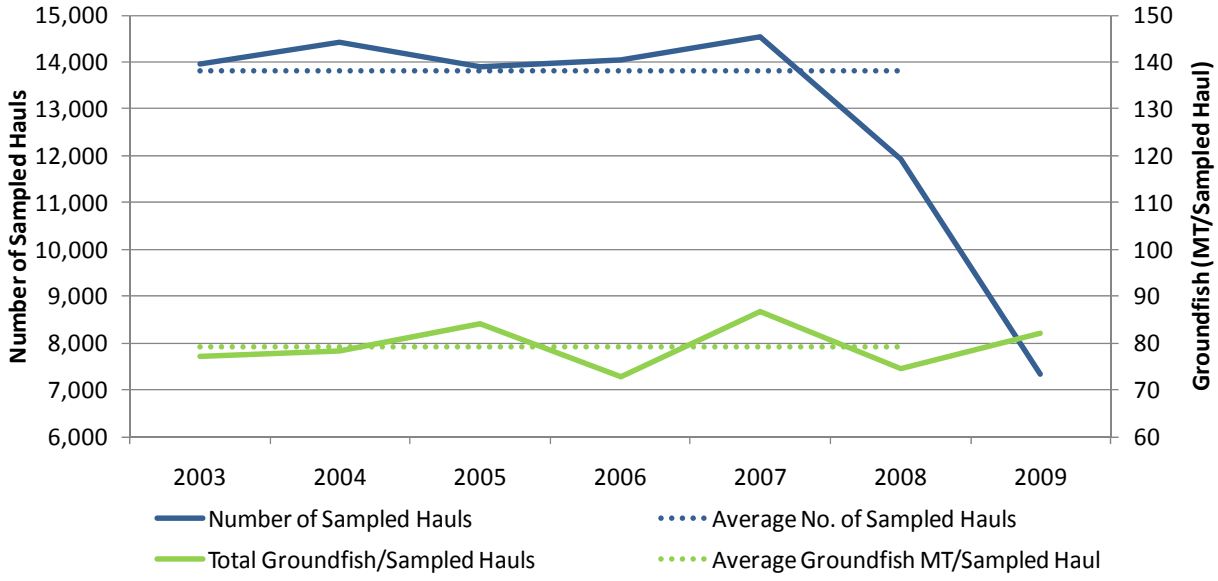

Figure 13. Number of Sampled Hauls and Groundfish per Haul in the BSAI Pollock Fishery, 2003 – 2009
Source: Developed by Northern Economics from NMFS-AKR 2009.
Note: Data for 2009 are current through August 8, 2009.

2.2.5 Potential Changes in Fishing Behavior under Amendment 91

The primary goal of the Chinook Bycatch Data Collection Program as proposed by the Council will be to measure the effectiveness of Amendment 91 at reducing Chinook bycatch, and to assess the effectiveness of the IPAs at reducing bycatch even in years when the abundance of Chinook salmon on the pollock fishing grounds is low.

While measuring the effectiveness of the program may seem straightforward, when one delves deeper into the issue the complexity of the problem becomes apparent. For example, a major issue is the baseline against which the program is compared. If the effectiveness of Amendment 91 is compared to Chinook bycatch levels in 2007—the year with the highest Chinook bycatch on record—it is very likely the program will appear to be effective regardless of what actions are taken by industry. On the other hand, comparing to the program to 2008—the year with the third lowest level of Chinook bycatch since 1991—the program may not appear to be very effective if bycatch increases to 30,000 or 40,000, but still remains below the long-term average.

A comparison of Chinook bycatch under Amendment 91 to Chinook bycatch in any particular year in the past will suffer from intrinsic differences in the exogenous conditions that contributed to Chinook bycatch in that year. These exogenous factors include the abundance of salmon on the pollock grounds and the locations in which pollock are aggregated, among other factors. It is possible to make comparisons against averages over several recent years, but this may also prove to be impractical, particularly in the near term when there is only one year, or just a few years, of experience operating under IPAs.

It has also been suggested that the effectiveness of the program could be determined by comparing bycatch of participants in the IPAs to operations that are not participating in an IPA. This comparison requires that there are a sufficient number of parties in IPAs and a sufficient number that have opted out of IPAs. Given that there is significant bycatch allowance penalty for operations that opt out of IPAs,[10] industry has indicated that it is unlikely that individual operations will choose to opt out of IPAs. Thus, comparisons between IPA participants and non-participants may not be possible.

Measuring the effectiveness of Amendment 91 will not be straightforward. The effectiveness of the program may need to be measured against itself or against a combination of recent years. In the first year of the program, analysts could compile data about fishing behavior and bycatch levels, and industry could document any changes in fishing behavior or performance that have occurred since implementation (or approval[11]) of the program. This information could then form a baseline against which subsequent years are compared. Amendment 91 may result in a number of systematic behavioral changes among participants in the BS pollock fishery. It may be possible to measure and quantify many of these behavioral changes using data that are currently collected or that are proposed for collection under the alternatives in this action.

During the preparation of this analysis, there have been numerous discussions among members of the pollock industry and analysts about the question of how industry might alter its behavior in an effort to reduce salmon bycatch. Similar discussions were also conducted during preparation of the RIR for Amendment 91 (NPFMC, 2009). A list of the potential behavioral changes specifically mentioned or inferred from these discussions is included in Table 7. The changes are categorized by the primary

[10] Amendment 91 penalizes operations that opt out of IPAs by providing them with smaller bycatch allowances. Vessels that opt out get their pollock-based-share backstop cap of 28,496 salmon, rather than their pollock-based-share of 47,591 salmon—a 40% reduction in allowable salmon.

[11] It is possible that as a result of the Council deliberations over the past few years, the industry has already made behavioral changes with respect to bycatch. These behavioral changes could be considered In evaluating the effects of Amendment 91.

impetus for the change. Discussions of each of the behavioral changes are included in the sections that follow the table. The behavioral changes are discussed without regard to whether data to evaluate these changes are actually available. The availability of data will be discussed in the assessment of the alternatives. This same set of behavioral changes is used to frame the analysis of the alternatives.

Table 7. Behavioral changes suggesting salmon bycatch avoidance

Item	Source of Change	Change
1	IPA driven changes	Creation of individual accountability and incentives
2		Changes in rolling hot spot definitions and requirements
3		Increased communication and planning within cooperatives
4		Additional research investigating ways to avoid bycatch
5	Co-op driven changes	Slower starts to fishing season
6		Systematic temporal shifts in effort
7		Relax limits on acceptable age of fish in holds at delivery by shore plants
8	Vessel behavioral changes	Purchase and use of new technologies that reduce Chinook bycatch
9		Increased amount of time searching
10		Shorter and smaller tows
11		Increased monitoring of salmon caught within each tow
12		Increased number of successive tows over the same grounds
13		Increased numbers of movements to avoid Chinook
14		Individual behavioral changes related to hot spot areas
15	Unintended consequences	Reductions in average pounds of pollock landed per trip
16		Changes in the distribution of bycatch rates
17		Increases in unharvested pollock left “on the table” at the end of the year
18		Systematic spatial shifting of effort
19		Higher overall costs of fishing
20		Lower overall levels of product quality and lower overall levels of revenue
21		Additional consolidation of the AFA fleets
23	Desired Results	Transfers of Chinook allowances and pollock allocations
23		Create an incentive to reduce bycatch in years of low encounters
24		Use of additional performance-based penalties or payments
25		Lower salmon bycatch rates and totals

2.2.5.1 IPA Driven Changes

The IPAs could drive behavioral changes through the creation of systems of individual accountability, and additional incentives such as salmon savings plans and performance based penalties and rewards. The IPAs could also establish rules for the RHS programs. In addition, IPAs could facilitate increased levels of communication among cooperatives and across sectors. Finally, IPAs could collaborate to fund research to develop technologies or information that may lead to reduced Chinook bycatch.

Creation of Individual Accountability and Incentives

The hard cap is intended to create an incentive for reducing Chinook bycatch within the sectors by apportioning the bycatch cap to the sectors. Within each sector, the cooperatives could apportion Chinook to individual vessels. Such apportionments would internalize incentives for reducing bycatch of Chinook at the individual vessel level. Vessel operators will be constrained by their individual bycatch allowances. If they use their allowance, they will have to stop fishing or obtain additional bycatch allowances.

The extent and the means by which cooperatives create individual accountability is a critical behavioral change that will be an indicator of the effectiveness of Amendment 91. Individual accountability may also induce other behavioral changes at the vessel, company, and cooperative levels—these other behavioral changes are discussed below.

Changes in Rolling Hot Spot Definitions and Requirements
Given the increased internalization of the costs of Chinook bycatch, it may be that systematic changes are made to the RHS program. For example, the threshold number of salmon used to define a hot spot may be reduced, or the eligibility standards for vessels that are allowed to continue fishing in the closed areas could be tightened. Development of more restrictive rules governing the RHS program would suggest that additional efforts are being made to avoid salmon bycatch.

Increased Communication and Planning Within and Between Cooperatives
Companies and cooperatives may exhibit increased levels of communication with respect to bycatch. Increased levels of communications may include information on:

- where Chinook have been found and where they have not been found;
- the locations of aggregations of pollock;
- the locations of roe-bearing pollock;
- bycatch avoidance (which may include bycatch avoidance guidelines and rules)

The Council's imposition of the Performance Standard at the sector level may also lead to increased communication across cooperatives. Since failure to meet the performance standard results in a decrease of the hard cap, all cooperatives participating in an IPA may be harmed if information regarding bycatch is not shared across cooperatives.

Additional Research Investigating Ways to Avoid Bycatch
Industry may fund and conduct additional research into ways to avoid Chinook bycatch. Industry may find that spending money on research may be cost effective in the long run. Industry sources indicate that there is ongoing research on the development of trawl nets that allow Chinook to escape while maintaining the CPUE of pollock. However, other research may also be funded by industry. Potential examples include:

- Methods to track schools of Chinook once they are encountered
- Improved fish finding equipment that is able to differentiate between Chinook and pollock
- Improvements in ways to count numbers of Chinook in each tow (e.g., video monitoring of fish as they dumped from codends into vessel holds, or deck sorting systems that separate pollock from Chinook) to facilitate better fishing location choices.
- Genetic studies to track natal rivers of Chinook encountered while fishing for pollock

2.2.5.2 Co-op Driven Changes
Individual cooperatives, or in the case of the CP and Mothership cooperatives, individual companies, are also expected to be drivers of change that will lead to reductions in Chinook bycatch. Cooperatives could organize slower starts to the A season, and increase effort in the early part of the B season. Shore-based processors around which cooperatives are organized may become more flexible with regard to how long fish may be stored in the hold prior to processing.

Slower Starts to Fishing Season
Since some of the highest bycatch rates of the year occur at the very beginning of the fishing year, cooperatives may make a concerted effort to reduce bycatch at the start of the A season. This will likely reduce the rate of pollock harvests at the start of the season. A slower start may allow vessels to find schools of pollock where there are few Chinook, and may manifest itself in various ways:

- fewer vessels on the grounds in the initial weeks of the A Season;
- vessels on the grounds conducting searches but not actively fishing;
- broader patterns of small amounts of activity

Systematic Temporal Shifting of Effort
We expect an industry-wide shift in timing of fishing activities from periods that have historically had higher bycatch, to periods that have had lower bycatch. One potential change is likely to be a slower start to the A Season—not until areas of low Chinook bycatch have been found will pollock fishing begin in earnest. A slower start to the A season may result in a decrease in the percentage of the A Season pollock quota that is harvested during the first few weeks of the year. Once pollock fishing begins in earnest, because of the hypothesized increases in searching, shorter tows, and smaller shore-based deliveries, the harvest rate of A Season quota could be lower than in previous years. This may result in a longer A season, with landings continuing into April and possibly May.

The months of June and July have typically been periods of relatively low bycatch, and bycatch in the B Season tends to increase later in the year. While product quality of pollock may be lower early in the B Season, the tradeoff between lower quality and lower bycatch may result in the shift of B Season effort into June and July. Finally, as part of efforts to avoid bycatch at the end of the year, cooperatives may in some years choose to stop fishing for pollock earlier in the year, rather than risk exceeding the cooperative's bycatch allowance, and possibly causing the sector to exceed its share of the bycatch cap.

Greater Flexibility by Shore Plants Regarding Acceptable Age of Fish in Hold
Shore-based cooperatives may find that CV efforts to reduce bycatch may increase the time it take CVs to fill their holds. Rather than requiring CVs to make smaller deliveries, shore-based processors may relax their delivery timing constraints to allow these salmon avoidance efforts.

2.2.5.3 Vessel Behavioral Changes
Vessel owners and operators may make efforts to reduce bycatch. For example, some operators may purchase and be early adopters of new technologies that may lead to reduced Chinook bycatch. Operators may increase the amount of time they search for fish and reduce the length of tows. Operators may alter the way that fish enter the hold to enhance their information on the number of Chinook in each tow. If the number of Chinook is low, then vessels may be more likely to make a second or third pass over the same grounds. If number of Chinook is relatively high in a particular tow, vessels may be more likely to move to new grounds. Finally, fewer "low bycatch vessels" may take the risk of fishing in an RHS area that is closed to "high bycatch vessels."

Purchase and Use of New Technologies that Reduce Chinook Bycatch
The development of new technologies, such as more precise fish finding equipment and specialized nets, may reduce Chinook bycatch in the future. Development and testing of specialized nets is ongoing, according to industry sources. One of the problems with developing nets is the amount of bycatch reduction relative to the reductions in pollock CPUE. A net that reduces Chinook bycatch by 25 percent, but also reduces the pollock CPUE by the same amount is of no benefit. The ratio of Chinook reductions to pollock catch rate reductions must be sufficiently high for the costs of the trawls and potentially higher fuel use incurred by additional towing to offset the perceived benefits of a reduction in Chinook bycatch.

Once acceptable nets are developed, vessel operators may begin to use them, even if these nets result in lower pollock CPUEs. Continued use of specialized nets, even when salmon abundance is low may provide evidence of the effectiveness of the IPAs in reducing salmon bycatch under all conditions.

Increased Amount of Time Searching
The amount of time spent searching for pollock aggregations upon which to fish may increase, as operators search for aggregations with acceptably low Chinook salmon present. For shore-based CVs, the increased time searching will likely occur primarily before first tows of each trip to limit the time from putting fish in the hold until delivery.

Shorter and Smaller Tows
The length (both time and distance) of tows may decrease. Short tows through a single school will allow an operator to determine with greater certainty the species composition of that particular school. For the same reason, operators may reduce the use of very long tows to move through multiple aggregations fish. The size of the average tow may decrease and the number of overall tows may increase. It is also possible that shorter tows may impact CPUEs, but it is not clear whether CPUEs will go up or down.

Increased Monitoring of the Number of Salmon Caught within Each Tow
Vessel operators may increase efforts to determine the catch composition of each tow before they reset on a particular school. If a particular tow has high bycatch numbers, then it will be important not to tow again at the same location. Increased levels of bycatch monitoring are expected to be particularly evident within the catcher vessel fleet, which in many cases in the past—particularly when unobserved—may not have had reliable estimates of amount of salmon captured until after the delivery. These monitoring efforts may result in modifications to the vessel or to vessel operating procedures. Vessel operators may conduct their own sampling to estimate bycatch numbers on each tow.

Increased Number of Successive Tows over the Same Grounds
When vessel operators find an aggregation of pollock that is relatively clean with respect to salmon, they may tow back over the same area in successive tows. With shorter tows and the need to fish in clean areas, the number of successive tows over the same area may increase relative to fishing patterns prior to implementation of Amendment 91.

Increased Numbers of Movements to Avoid Salmon
Vessels that have caught high numbers of Chinook in a particular tow may move rather than re-tow over the same grounds. The fact that observers will be onboard CVs for 100 percent of trips means that onboard observer bycatch sample information will be available to small harvesters for a much larger percentage of tows. All vessels, even those that have previously had 100 percent observer coverage, may increase their own internal monitoring of Chinook bycatch and may use this information to move to avoid additional bycatch. Finally, given that all vessels will be subject to bycatch constraints, we expect more moves to avoid salmon even among vessels that previous had high levels of bycatch monitoring and awareness.

Individual Behavioral Changes Related to Hot Spot Areas
Low bycatch vessels that are eligible to continue fishing in an area that is closed through the RHS program may change their behaviors (i.e., they may be less likely to remain in the closed area than in the past).

2.2.5.4 Unintended Consequences

There are several changes in the fishery that are not necessarily desirable outcomes, but are considered unintended consequences of Amendment 91. These changes could suggest that incentives are effective in

creating an incentive to avoid salmon, particularly, if observed in years of low bycatch. Possible unintended consequences are:

- Reductions in average pounds of pollock landed per trip
- Changes in the Distribution of Bycatch Rates
- Increases in un-harvested pollock left "on the table" at the end of the year
- Systematic spatial shifting of effort
- Higher overall costs of fishing
- Lower overall levels of product quality and lower overall levels of revenue
- Additional consolidation of the AFA fleets

Reductions in Average Pounds of Pollock Landed Per Trip by CVs
Because of previously discussed expectations regarding increased time spent searching for clean fishing grounds, shorter tow lengths, increased numbers of movements to avoid salmon, and use of gear modifications, it may be more difficult for CVs to fill their holds within the time constraints imposed by processors. Unless shore plants relax those time constraints, there may be a reduction in the average CV trip size (measured in pounds of pollock).

Changes in the Distribution of Bycatch Rates
In the absence of sound estimates of Chinook abundance on the fishing grounds, changes in the distribution of salmon bycatch rates across the fishery may be indicative of increased efforts to reduce salmon bycatch. Greater concentration of bycatch rates at the lowest bycatch levels could indicate that vessels are concentrating efforts in areas of known low bycatch reducing the overall amount of bycatch. While some tows will be used to assess bycatch in areas, the number of these exploratory tows and the number of tows taken in areas above the lowest observed bycatch rates could suggest that salmon bycatch measures are effective. This behavioral change could be considered unintended, because efforts to reduce salmon bycatch may not always result in changes in the distribution of bycatch rates across vessels and tows.

Increases in Unharvested Pollock Left At the End of the Year
Although bycatch measures are not intended to reduce pollock catches, it is possible that some portion of the allocated pollock could be left unharvested to avoid salmon bycatch. Because bycatch rates have been highest toward the end of the B Season, it may be risky for vessels in a sector to go after the last pollock. Even if vessels are not participating in IPAs, the hard cap on Chinook bycatch may, in some years, place constraints on pollock harvests.

Systematic Spatial Shifting of Effort
We expect an industry-wide shift into areas that have tended to have lower bycatch levels. As seen in Figure 11 on page 24, the "east-west tow of the horseshoe" has had particularly high bycatch in previous A Seasons. We expect that areas that have had high bycatch will see much less fishing effort by the fleet as a whole. Areas that have had less bycatch with acceptable pollock CPUEs will see increases in effort.

Higher Overall Costs of Fishing
Operating costs may increase due to increased search times, an increased number of moves, shorter tows, an increased number of tows, and smaller landings per trip. Spatial and temporal shifts in effort are also likely to increase the cost of fishing. Higher costs do not by themselves reveal how behaviors have changed, but because operating costs are measured in dollars it is a convenient way to summarize the

effects of behavioral changes. In other words, we may note that the fleet is making shorter tows and moving more often, but we can't add "seven additional moves" to "an average one hour decrease in towing times" and "15 more tows" to yield a meaningful indicator. It may be possible, however, to calculate the cost in terms of dollars of shorter but more frequent tows and the costs of the additional numbers of moves, and sum those estimates to yield a combined estimate of the net change in the cost of fishing under Amendment 91. While operating costs may increase, higher costs alone should not be viewed as an indicator of the effectiveness of Amendment 91 or of the IPAs. It is certainly possible that the fleet could reduce bycatch through innovations or the discovery of new fishing grounds that do not also increase costs.

Lower Product Quality and Revenues
Shifts in fishing effort to different areas and time periods may reduce product quality and overall revenues. Shifts in effort from October to June could result in significantly lower flesh quality, which could result in shifts away from high value fillets to lower quality products. Changes in quality could affect all of the major pollock products, and could result in an increase in the production of mince and meal. Lower quality products will reduce overall levels of revenue. While product quality and revenues per harvested ton of pollock could decline, the absence of reductions in product quality or revenues should not be viewed as a failure of Amendment 91 or of the IPAs.

Additional Consolidation of the AFA Fleets
Higher operating costs under Amendment 91 may result in a reduction in the number of active AFA vessels. Vessels that are most likely to be removed from the fishery are those that continue to have high levels of Chinook bycatch, or those that are only marginally profitable.

2.2.5.5 Desired Results

The primary purpose of Amendment 91 is to reduce Chinook PSC in the BS pollock fishery. Amendment 91 may also result in transfers of bycatch allowances and transfers of pollock allocations from high bycatch vessels to low bycatch vessels. IPAs may create additional incentives to keep bycatch low even when the abundance of Chinook on the grounds is low. For example, IPAs may create programs with incentives to reduce salmon bycatch below a vessel's allowance in a year of low interactions, by awarding that vessel a greater share of the sector's apportionment in the following year.

Transfers of Chinook PSC Allowances and Allocation of Pollock
Chinook PSC allowances may be implemented, by sectors and cooperatives as part of Amendment 91. Transfers of these allowances may provide direct evidence that individuals are responding to incentives to avoid Chinook bycatch. The acquisition of additional PSC allowances will not be free of cost, and may in fact become very expensive. If a vessel with high bycatch finds it does not have enough Chinook allowance to harvest its pollock, the cost of acquiring additional Chinook from vessels with lower bycatch will become part of that vessel's profit and loss calculus. At some point, the cost of acquiring additional bycatch allowances may be greater than the additional net revenue the vessel will receive for its pollock. If that occurs, the vessel is likely to quit fishing for pollock and transfer any unused pollock allocations to vessels with lower bycatch.

Transfers of PSC allowances paired with pollock allocations may also occur. These paired transfers are expected to flow most often from high bycatch vessels to low bycatch vessels. It is also likely that paired transfers will flow from vessels with relatively high operating costs to vessels with relatively low operating costs (i.e., from relatively inefficient vessels to relatively efficient vessels). Vessels that are relatively efficient harvesters of pollock are more likely to remain profitable, even after accounting for the higher costs of fishing due to behavioral changes to reduce bycatch.

The market value of PSC allowances may be a useful indicator of the additional revenue that the purchasing vessel expects to earn if it were able to catch the additional pollock that one additional Chinook would allow. Since the seller was also a willing participant in the transaction, the market price may also be used as an indicator of the net operating revenue for the seller. In this case, the calculus is somewhat more complex because we must presume that the seller would not need the allowances in question unless additional pollock were acquired. Any such computation will also require that the consequences of use of the allowances be considered. In some IPA development discussions, it has been suggested that the use of allowances could reduce a vessel's future allocation of allowances. If this occurs, a vessel's willingness to sell an allowance could decrease notably.

Create an Incentive to Reduce Bycatch in Years of Low Encounters
It is uncertain whether CVs will come forward with a program similar to the SSIP that was proposed in March. However, if an IPA is developed that includes an incentive to reduce salmon bycatch in years of low Chinook encounters to receive a greater portion of the sector's apportionment in future years (when interactions could be higher) participating vessels may avail themselves of those opportunities.

Use of Additional Performance-Based Penalties or Payments
The At-Sea Processors Association proposed the FIP program in March, as a key element of its proposed IPA. If performance measures, such as the bycatch competition suggested in the FIP, are a part of the IPAs proposed under Amendment 91, then we would expect that participating members would work toward minimizing penalties or maximizing payments that could accrue through such additional incentives. Evidence that an IPA is providing effective incentives to reduce bycatch in low bycatch years may be the imposition or distribution of penalties or rewards. A performance-based vessel rating system would likely take into consideration several key measures of bycatch performance with each measure receiving a weighting factor based on its relative importance. If a performance-based rating system is to provide additional incentives, vessels with the best ratings might receive a bonus, and vessels with the lowest ratings might be penalized. The rating system specifications, as well as bonus and penalty terms, would be specified by the IPA.

Lower Chinook PSC Rates and Totals
Effective individual accountability and incentives developed within the IPAs should reduce salmon bycatch and bycatch rates for a given level of abundance of salmon on the grounds. If a reliable independent estimator of Chinook abundance on the pollock fishing grounds is developed, these bycatch rates and bycatch totals at different abundance levels could be compared across the fleet and across years to assess the effectiveness of IPAs.

2.3 Alternative 1 – Status Quo

This section describes the status quo data collection program and examines ways to measure the effectiveness of Amendment 91 and the IPAs if no additional data are collected. The status quo data collection program includes changes to the observer program that will be implemented under Amendment 91. The assessment of Alternative 1 is divided into 3 sections:

- A description of the data collection program under the Status Quo (including all data collected under Amendment 91)
- An assessment of the ability of data available under Alternative 1 to measure expected behavioral changes.
- A summary of findings and conclusions for Alternative 1.

2.3.1 Description of Data Collection under the Status Quo

Several collection initiatives provide data that could support analyses of performance of salmon bycatch measures under the status quo. These include observer data, catch accounting data, vessel monitoring system data, commercial operators annual reports, annual cooperative reports, and annual IPA reports.

2.3.1.1 Observer Data in the BS Pollock Fishery

Monitoring CPs and Motherships

Current methods for estimating Chinook PSC of catcher/processors and catcher vessels delivering to motherships rely on requirements for two observers on each AFA catcher/vessel. Amendment 91 requires that a census of all salmon in each haul be used for determining Chinook PSC amounts. A census of the Chinook PSC would remove the variability associated with expanding the species composition data.

To ensure accurate counts of Chinook PSC, the following requirements apply to the catcher/processors and motherships:

- All Chinook PSC of any species must be retained until it is counted by an observer;
- Vessel crew must transport all Chinook PSC from each haul to an approved storage location adjacent to the observer sampling station so that the observer has free and unobstructed access to the salmon, and the salmon must remain within view of the observer from the observer sampling station at all times;
- The observer must be given the opportunity to count the Chinook and take biological samples, even if this requires the vessel crew to stop sorting or processing catch until the counting and sampling is complete; and
- The vessel owner must install a video system with a monitor in the observer sample station that provides views of all areas where salmon could be sorted from the catch and the secure location where salmon are stored.

Monitoring CVs Delivering to Shoreside Processors

Under Amendment 91, NMFS requires an observer to be onboard during all days that a catcher vessel, regardless of size, delivering to an inshore processor is directed fishing for pollock in the Bering Sea (100% coverage) to ensure that salmon are not discarded at sea. Amendment 91 requires that all salmon of any species are retained onboard the catcher vessel and delivered to a processing plant where it would be counted and potentially included in biological samples. Salmon will continue to be included in at-sea species composition samples for groundfish. Note that for uncommon species such as salmon, a large sample size is required to produce statistically robust estimates. In addition, Chinook salmon are difficult to differentiate from other species of salmon unless an observer can examine each fish.

Monitoring Shoreside Processors

Under current regulations, each inshore processor that receives AFA pollock is required to develop and operate under a NMFS-approved catch monitoring and control plan (CMCP). Each processor must annually submit a CMCP to NMFS. The monitoring standards for CMCP are described in regulation at 50 CFR 679.28(g). Plant layouts and operations vary widely among processors; therefore, the CMCP regulations were developed as a series of performance-based standards that each processor must meet. Each CMCP describes how a particular processor will meet each standard.

Amendment 91 implements additional measures to existing CMCP performance standards in order to ensure that fisheries observers have the means to count all Chinook salmon in each delivery. These measures includes the following additions to requirements for the inshore processors to ensure that observers have access to all salmon bycatch prior to the fish being conveyed into the processing area of the plant.

- Processors are prohibited from allowing salmon to pass from the area where catch is sorted and into the factory area of the processing plant;

- No salmon of any species are allowed to pass the observer's sampling area;

- The observer work station currently described in regulations at 679.28(g) must be located within the observation area;

- A location must be designated within the observation area for the storage of salmon, and;

- All salmon of any species must be stored in the observation area and within view of the observer at all times during the offload.

2.3.1.2 NMFS Catch Accounting System

NMFS determines the number of Chinook salmon caught as bycatch in the BS pollock fishery using the CAS. The CAS was developed to receive catch reports from multiple sources, evaluate data for duplication or errors, estimate the total catch by species or species category, and to attribute catch to the appropriate catch category. Amendment 91 requires observers to census salmon for CPs, motherships, and catcher processors. The census information collected by observers will be imported into CAS and will be the agency record for salmon bycatch from the shoreside and the at-sea sectors. The census information in CAS will be available down to the vessel level. For CPs and motherships, the CAS information will be available down to the haul level. For CVs, salmon catch information will be available at the trip level.

Other Data Included in the CAS

The CAS comprises not only observer data used to estimate Chinook bycatch, but also several other sets of data, including Landing Reports and Production Reports, both of which are collected daily for the BS pollock fishery through the eLandings System.

Landing Reports are the equivalent of ADF&G Fish Tickets and include the same set of data fields as Fish Tickets. Landing Reports are issued by the processing plants and motherships for each delivery of fish. Fields in the Landing Report include identifiers for both the harvester and processor, dates for the beginning of fishing and for the landing date, area fished (6-digit stat areas indicating ½˚ of latitude × 1˚ longitude), weights, and condition codes of all species landed.

Production Reports, formerly known as Weekly Production Reports, are submitted daily by all processors. Shoreside Production Reports (SPR) summarize product weight by species and product types by FMP Area (BSAI or GOA). Since shoreside processors typically work with many harvesting vessels that may use different types of gear, the SPR does not break out production by gear. At-Sea Production Reports (APRs) not only report product weights by species and product type, but also provide harvesting locations[12] and gears used.

Amendment 91 also implements electronic logbook reporting requirements for catcher processors. NMFS will require vessel operators to report the salmon bycatch counts by species for each haul. This information will be transmitted to NMFS using eLandings.

[12] Beginning in 2009 CPs and Motherships are required to report 6-digit statistical areas, along with the 3-digit FMP zone information that was reported in the past.

2.3.1.3 Vessel Monitoring System Data

All vessels participating in the BS pollock fishery are required have an operating satellite transmitter (VMS unit) that relays the position and bearing of the vessel to NMFS every 15 minutes. VMS data are used primarily for enforcement purposes. Data in the VMS database can be used to plot the path and speed the vessel is travelling at any time they are operating. Because a vessel that is dragging a trawl through the water travels slower than when transiting between fishing areas, the use of algorithms to calculate speeds and distances. These algorithms assign fishing or transiting activity to a vessel. However, these assignments are somewhat speculative, as vessels may slow to search for fish, the VMS reporting interval may not accurately allow the calculation of vessel speed, and transiting characteristics between vessels may be different. These sources of variabilitymay result in a false fishing designation.

VMS data can also be plotted using geographic information systems (GIS). Plotting VMS data using GIS allows analysts to visually assess activities of fishing and processing vessels. Figure 14 and Figure 15 below show hypothetical VMS plots of a single CP trip and three CV trips, respectively. Because VMS plots represent the activities of a single vessel, NMFS deems them to be confidential and does not release actual plots to the public. Therefore, the data shown in these figures are hypothetical and have been constructed using GoogleEarth™ to simulate actual VMS plots.

Figure 14 has been constructed to represent the activity of a single trip of a pollock catcher processor. In this hypothetical trip, the processor is up near the Pribilof Islands. The hypothetical VMS track indicates that the vessel fished in three different areas during the trip—each area successively farther west. A careful examination of the shorter zig-zagging lines that constitute the fishing activity in each area indicates that the vessel may have made as many as 46 tows. However, theVMS reporting interval may be too large to accurately calculate speed because it fails to incorporate the zig-zag behavior or the interval includes a mix of fishing and transiting speeds between locations. In this case, the vessel speed may be faster than what really occurred; further complicating inferences about whether the vessel was fishing or transiting during each segment. We are also unable to determine from these data the reason the skipper chose to move the vessel to the different areas.

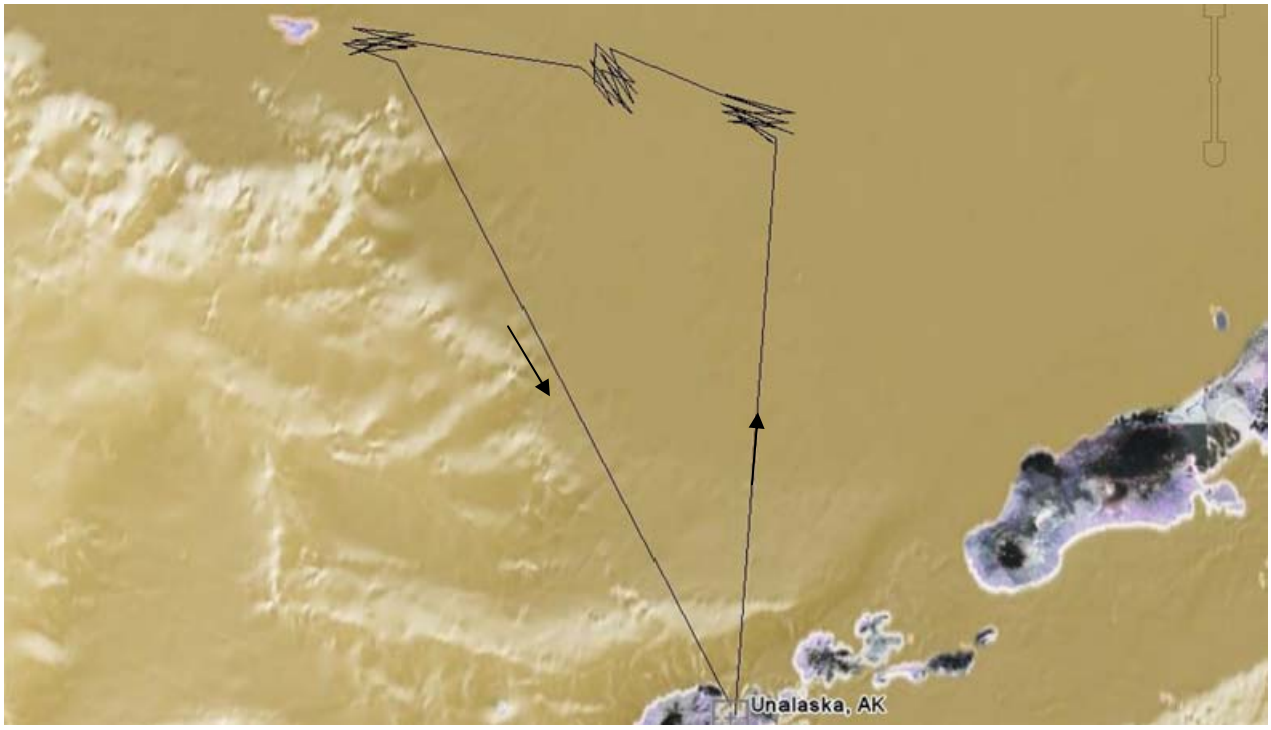

Figure 14. Hypothetical VMS Track of a Pollock Catcher Processor Trip
Source: Created using Google Earth™ without actual data. Actual VMS data of individual vessels are confidential and cannot be released.

Figure 15 shows hypothetical VMS tracks of three CV trips. We will discuss each of these trips starting from the most westerly of the three. In this trip, it appears that the vessel fishes in two different locations during the trip. If actual VMS data were available, inferences based on assumptions about speed are clearer than in Figure 14, given the distinct clustering of slower versus higher transiting speed; however, the VMS reporting interval may still result in an inaccurate assessment of fishing activity.

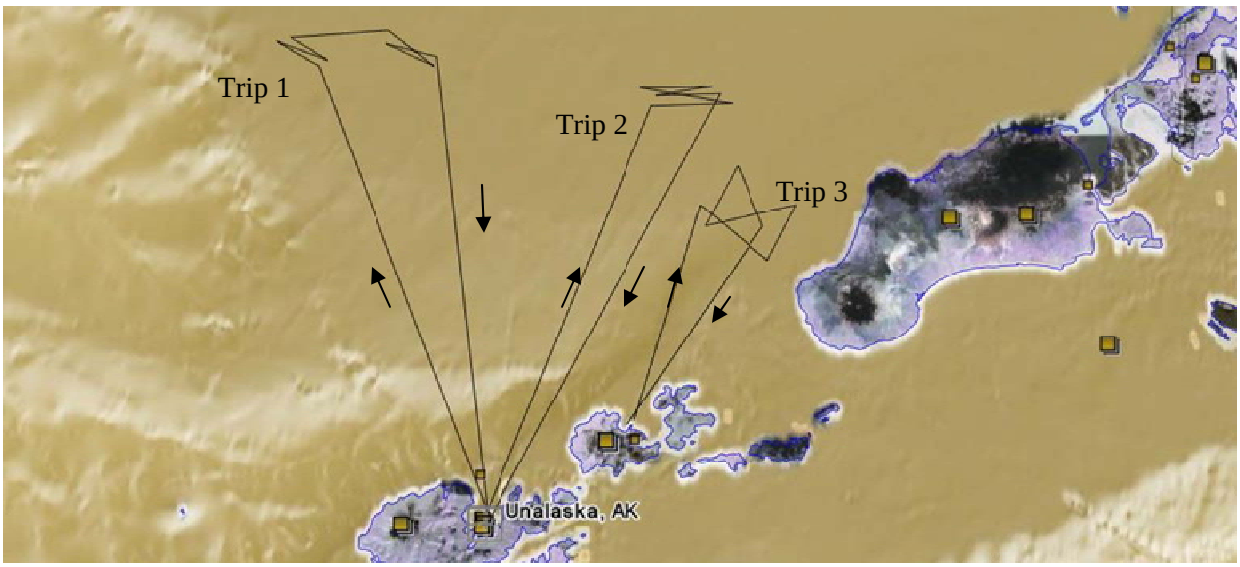

Figure 15. Hypothetical VMS Tracks of a Three Pollock Catcher Vessel Trips
Source: Created using Google Earth™ without actual data. Actual VMS data of individual vessels are confidential and cannot be released.

The second trip shown in Figure 15 is a relatively straightforward trip. It appears the vessel made as many as five tows in a single location before returning home. Each of the shorter segments represents between 5 and 10 miles. It should be noted that even in this trip, where the tows are relatively close together, the vessel may have been fishing on more than one aggregation of pollock. It is possible that the skipper may have considered his first tow a bust and moved to a new area in the northwesterly jag following the first tow.

The hypothetical CV trip listed as Trip 3 is much more difficult to interpret. Without additional information, we are likely to infer that fishing was spotty and that the vessel fished in five different locations. Fortunately, VMS data can be linked directly to observer data using the date, time, and geographic coordinates. In this hypothetical case (assuming the VMS data and observer data have been linked) we found that in fact, the vessel's tow was relatively long. It then towed in a northeasterly direction and then, without pulling the trawl from the water, turned back in a southwesterly direction and continued to trawl. From there it made a tow back to the northeast and then a last tow down to the Southeast before heading back to port. In this case we conclude that the vessel fished in five different areas, including two areas on its second tow.

2.3.1.4 Commercial Operator Annual Reports

Commercial Operator Annual Report (COAR) data are completed by all processors, annually. COAR data report the total annual production of all products, as well as the first wholesale value of the products. COAR data also show production and values by some additional sub-categories that are not reported in daily (or weekly) production reports. Fillets, for example, are not only categorized by the type of fillet, but information on the form in which fillets are sold is also reported (i.e., IQF, block or shatter pack). While COAR data are quite useful with respect to fillets and products for which there are no significant product quality differences, COAR data are less useful for products where the quality grades are an important factor in the prices paid.

One such product is pollock surimi, which can be produced in many different quality grades. Surimi that is produced as ancillary product from the trimmings of fillets is a relatively low grade product. Surimi that is produced as primary product with the best portions of pollock flesh will be a much higher grade product that commands significantly higher market prices. Because the COAR data do not differentiate between surimi grades, an intentional shift by processors to a different grade of surimi (e.g., from high-grade primary-product surimi to a low-grade ancillary surimi) may appear in the data as a significant change in market price, when in fact it is simply reflective of a lower grade of product.

Pollock roe is another product for which grades and quality are important. Pollock roe is reported in COAR data as a single product and the reported prices are a weighted average of all prices for all grades received during the year. The COAR data as they are currently collected do not allow analysts to distinguish between product grades or changes in product quality.

Another issue with COAR data that is a concern to analysts is the fact that due to reporting differences, the production amounts shown in the COAR typically do not correspond exactly to product amounts shown in the daily (weekly) production reports. Notwithstanding the inconsistencies with production reports in the COAR data, they are generally regarded as an invaluable resource that provides Alaska resource managers a higher level of data on wholesale and ex-vessel values than is found anywhere in the United States.

2.3.1.5 Annual Cooperative Reports Submitted as a Requirement of AFA

At the beginning of each year, each of the AFA cooperatives must submit a report to the Council detailing the activities of the cooperative for the previous year. The cooperative reports indicate allocations of

pollock and other groundfish to each member of the cooperative, and include some information regarding transfers of pollock and other species among members. The cooperative reports also summarize harvests of all groundfish species by all member vessels in both the BSAI and the GOA. Estimates of total prohibited species catches for all species including salmon are also reported for each vessel.

While cooperative reports do not represent official NMFS data on groundfish harvests and PSC, they are one of the only sources of disaggregated catch data that are available to the general public, and that can be used by analysts to report comprehensive data on individual AFA vessel harvests without violating NMFS and ADF&G rules on data confidentiality.

2.3.1.6 Annual IPA Reports Submitted as a Requirement of Amendment 91

Amendment 91 requires the managers of each IPA to submit an annual report to the Council. The Council's April 2009 motion on Amendment 91 listed the following elements that must be included in the IPA annual reports to the Council:

1) A comprehensive explanation of incentive measures in effect in the previous year.
2) An assessment of how incentive measures affected individual vessels.
3) An evaluation of whether incentive measures were effective in achieving salmon savings beyond levels that would have been achieved in absence of the measures.

The annual IPA reports could be one of the industry's best tools to demonstrate efforts to reduce Chinook PSC. AFA members have conveyed in public testimony that they have a strong incentive to provide detailed information that can be used to examine the effectiveness of the incentives for vessels to reduce Chinook PSC, even in years of relatively low Chinook PSC.

Although some uncertainty arises from the lack of specificity in reporting requirements, the generality also provides IPA participants the flexibility to adapt their reports to their IPA structures and performance. The IPA reports should provide detailed information on how the additional incentives created by the IPA have affected Chinook PSC. Depending on the IPA structure these incentives might differ and could require different information to adequately communicate the incentives. In addition, the IPAs could use the annual reports as a platform to report on other optional measures that members have undertaken to reduce Chinook PSC. These optional measures may include a summary of temporal and spatial shifts in effort undertaken by the fleets, as well as an overview of the use of new gear, technologies, or research to reduce Chinook PSC in order to make this information available to managers, analysts, and decision makers. Analysts have assumed for purposes of this analysis that certain elements will be described in the IPA reports, which it is believed that industry will provide. The scope of these reports could be clarified to remove any ambiguity and ensure reports fully meet the Council's expectations in a future action.

Verification of information in IPA reports may be difficult. It may be in the interest of IPAs to report certain practices or results, especially if IPAs are not as effective at reducing Chinook PSC as hoped. On the other hand, since false reporting in an IPA could be subject to an enforcement action, participants expose themselves to some risk if they choose to report inaccurately. Notwithstanding these uncertainties, IPA reports are likely to be key sources of information on several aspects of their operation and effectiveness in reducing Chinook salmon bycatch.

2.3.2 Discussion of analytical uses of the data

In this section we examine the ability of Alternative 1 to reliably measure and quantify the behavioral changes that are expected to result from Amendment 91. Expected behavioral changes are categorized based on the mechanism driving the change: (1) IPAs, (2) Cooperatives, (3) Vessels, (4) Unintended

Consequences, and (5) Desired Results. For each behavioral change, we summarize the existing data sources that are available to measure and assess the behavioral change. We also address the accuracy, reliability and usefulness of the data, with a particular emphasis on: (1) evaluating the effectiveness of Amendment 91 in ensuring that bycatch levels remain below the performance standard and, (2) evaluating the effectiveness of the IPAs in reducing bycatch even in years of low abundance on the grounds.

2.3.2.1 Ability of Alternative 1 Data to Measure IPA Driven Behavior Changes

A management structure that supports IPAs could provide effective incentives for behavioral changes to avoid salmon bycatch. Certain aspects of these behavioral changes should be revealed through data collected under the status quo.

Creation of Individual Accountability

Creation of individual accountability is one of the cornerstones of the bycatch reduction measures in Amendment 91. However, the specific methods for creating individual accountability are left to the sectors, cooperatives, and IPAs. Annual IPA reports are required to include a comprehensive explanation of incentive measures in effect in the previous year, an assessment of how incentive measures affected individual vessels, and an evaluation of whether incentive measures were effective in achieving salmon savings beyond levels that would have been achieved in absence of the measures. In general, these requirements result in descriptions of the IPA and the individual accountability that arises under the IPA structure. While it is presumed that each vessel will be allocated a share of the Chinook bycatch allocation in proportion to its share of BS pollock,[13] the responsibility for the actual allocations will be made by cooperatives and IPAs. Therefore, NMFS may not have data on individual vessel bycatch allowances unless the sectors, cooperatives, and IPAs provide this data to the agency. This information could be documented in the annual IPA reports, including the formulas used to distribute the bycatch allocations and the allocation assigned to each vessel. In the event that IPAs are not formed in all sectors, the annual AFA cooperative reports could document the distribution of Chinook PSC allowances among vessels in the cooperative.

The IPA reports on the distribution of individual PSC allowances will be the basis for measuring performance of individual vessels. From this perspective, the IPA reports will be useful in determining the effectiveness of Amendment 91, assuming that the distribution of allowances is transparent.

Changes in Rolling Hot Spot Definitions and Requirements

Any changes to the RHS program should be identified in the IPA applications provided to NMFS. The effects of the RHS could be documented in detail in the annual IPA reports. Estimates of reductions in Chinook bycatch resulting from the closures may be calculated in the same manner as they have been calculated in the past by both industry and agency analysts, based on observer data, closure dates, and closure areas.

It should be noted that agency staff have expressed concerns about the methodologies used in the past by administrators of the RHS program to estimate Chinook savings. However, the Council has requested that RHS administrators provide these bycatch savings estimates. A summary of the methodology used to calculate Chinook savings resulting from the RHS is excerpted below as it appeared in Haflinger (2008).

[13] Amendment 91 assigns a greater proportion of the overall bycatch cap to shore-based catcher vessels than their share of the overall TAC of pollock.

1. Extract all observer data for haul locations falling inside a closure area, for a 5 day period preceding the closure. For shoreside catcher vessels, aggregate the hauls that have the same "start fishing date" so that hauls with the same bycatch rate are not artificially repeated. As an example, if 2 hauls from the same catcher vessel trip show up in the closed area, they will have the same bycatch rate because observers pro-rate bycatch evenly across all hauls. Consider them a single observation with a value equal to the sum of the two hauls' pollock and salmon.

2. Consider all of independent offshore sector (C/P and mothership) hauls, and combined "trip-level" hauls to be estimates of the bycatch ratio $Ri = \sum yi / \sum xi$, where y are counts of Chinook or chum salmon, and x is the pollock catch from individual hauls (offshore sector) or grouped, same-trip hauls (shoreside), and indicates a separate closure.

3. Extract the same haul or "grouped" haul information, for the same vessels, for the next 5 days. Their associated bycatch is available from either observer or plant delivery information. Compute their expected bycatch had they been able to stay and fish inside the now-closed area, by summing the pollock catch of all vessels in this category, and multiplying this summed pollock catch by the matching bycatch ration, Ri above.

4. Compute the standard error of this estimated Y (overall salmon bycatch if vessels had stayed in the area and fished with bycatch rate R) treating R as a ratio estimator (Snedecor and Cochran, Statistical Methods, 8th Edition, p 452).

Given the nature of a closed area, it is difficult to estimate salmon savings. A major criticism of the methodology is the assumption that bycatch in the closed area would have continued at the same rate after the closure as prior to the closure. While this assumption may be questioned, additional study is likely necessary to determine whether alternative assumptions can produce better estimates. As studies are undertaken estimates might be improved.

Notwithstanding shortcomings in estimates, the IPA reports should provide useful and accurate information concerning: (1) the RHS pre-season rules; (2) the areas that were closed along with the closure dates; (3) the "low bycatch vessels" that were allowed to continue fishing in an area after it was closed, as information should be available for assessing the veracity of these aspects of the reports. Despite the difficulties in producing accurate estimates of Chinook PSC savings routinely estimating those savings with a consistent methodology could provide useful information concerning the effects of the closures.

Increased Communication and Planning Within and Among Cooperatives

Evidence of increased communication and planning within and among cooperatives with the aim of reducing Chinook PSC may be included in the annual IPA reports, but only to the extent that members deem it necessary or in their interest to report. While this behavioral change may occur, it may not be one that can readily be measured.

Although unlikely to be quantifiable or verifiable, IPA reports are likely to be key sources of information on the efforts to improve communication and planning and the impact of those efforts on the effectiveness of IPAs in reducing Chinook PSC, particularly in years with few Chinook encounters.

Additional Research Investigating Ways to Avoid Chinook PSC

If the pollock industry funds additional research on Chinook PSC reduction, the IPA reports could document this research. Depending on the research, independent verification of funding and results may

be possible. For example, if industry funded a study to track Chinook movement patterns, they would most likely utilize research scientists who would publish their results in peer-reviewed publications. Although the results of such studies may be regarded as confidential until a viable product is developed, given the industry benefits from revealing successes, it is likely that reports will be produced in a manner that maintains acceptable levels of confidentiality. IPA reports documenting research activities are likely to be accurate, because over time independent verification of these reports will generally be possible. Industry expenditures on research may prove to be an effective tool in PSC reduction and may be an indicator of the effectiveness of salmon PSC management measures.

2.3.2.2 Ability of Alternative 1 Data to Measure Cooperative Driven Behavior Changes

Some salmon avoidance efforts undertaken at the cooperative level should be revealed by data collected under the status quo.

Slower Starts to Fishing Season

Decisions to start the fishing year more slowly in order to locate areas with few Chinook before fishing begins in earnest are likely to be made at the cooperative level, although the IPA may also encourage such actions. If the decisions to start slowly are left up to each cooperative (or possibly company, in the case of the CP and mothership cooperatives), then we would expect the annual AFA cooperative reports to document these efforts. Observer and VMS data, coupled with the CAS, can also be used to track fishing effort at the beginning of the year. These data can be compared with fishing effort during the same period in previous years. It is also possible that IPA reports will indicate whether the IPA may have affected these choices. It is likely that the cooperative or IPA reports will be accurate in this respect, because it is in the best interest of the cooperatives and IPAs to document their efforts to start the fishing season slowly and the timing and level of effort in the fishery can be independently verified using observer, VMS, and landings report data. Estimation of the effectiveness of these efforts will be hampered by the lack of an independent estimate of Chinook abundance. However, if one cooperative or company chooses to utilize a slower start and another does not, it may be possible to compare the bycatch performance of the two entities and make inferences about the relative effectiveness of each strategy. In any case, a decision to make a slow start to the A season would be an indicator of the effectiveness of the IPAs in creating additional incentives to modify fishing behavior in order to reduce bycatch.

Systematic Temporal Shifting of Effort

In addition to deciding whether to start fishing more slowly in the A season, individual cooperatives will determine whether they will shift effort from high Chinook salmon PSC months (January, February, September and October) to lower Chinook salmon PSC months (March, April, June, July, and August). This decision may involve a tradeoff between higher revenue and lower Chinook PSC. If a cooperative or company makes an overt decision to shift effort to low Chinook salmon PSC months, it will be in their own interest to report that decision in their annual AFA cooperative and IPA reports. Data from Landings Reports and observer data can be used to conduct a statistical analysis of the temporal distribution of fishing effort.

Greater Flexibility by Shore Plants Regarding Acceptable Age of Fish in Hold

Evidence of changes in the acceptable maximum length of time in the hold of fish for shore based deliveries may be provided in the AFA cooperative reports or in IPA reports. The elapsed time between the end of the first tow and the time the fish are delivered may be an indicator that shore based CVs are taking extra time to fill their holds as a result of efforts to reduce Chinook PSC. Increased flexibility on the part of shore plants regarding the age of delivered fish may also be inferred by using a combination of observer data and landings reports for vessels delivering to the processor. If shore-based processors do, in fact, increase their flexibility with respect to the acceptable age of delivered fish, it may show a willingness to compromise quality standards to reduce salmon Chinook PSC.

2.3.2.3 Ability of Alternative 1 Data to Measure Vessel Behavioral Changes

Vessel owners and operators are likely to be the drivers of many of the behavioral changes expected under Amendment 91. This section assesses the ability of the data that will be available under Alternative 1 to allow analysts to estimate these vessel driven changes.

Use of Specialized Nets that Reduce Chinook Bycatch

It is presumed that any documentation of the development of specialized nets to reduce Chinook salmon PSC will be anecdotal in nature, unless researchers utilize experimental fishing permits during the development process. In any case, it is likely that annual IPA reports will discuss these activities. There are two issues regarding data on specialized nets. First, since the use of specialized nets will be voluntary and operators are likely to have the flexibility of using them or not using them, obtaining accurate and independent data regarding the particular tows in which the net was used will be important. For example, if the use of a specialized net is deemed to be an indicator that the vessel is incentivized to reduce Chinook salmon PSC, but there is no reliable way to determine if the net was used, as opposed to simply having one on board, then the operator may be tempted to misreport the frequency with which the specialized net is actually used. This issue might be resolved if it is possible to document that the specialized nets are the only nets on board. Assuming that reliable documentation is available of the use of specialized nets on individual vessels, it may be possible to assess the effectiveness of the nets in reducing Chinook salmon PSC, by comparison with vessels not using those nets. The documented use of a specialized trawl, in and of itself, may be viewed as evidence that the IPAs are generating additional incentives to reduce Chinook salmon PSC. Actual estimation of the effectiveness of these trawls to reduce Chinook salmon PSC will also be useful, but may be difficult to generate in the near term.

Increased Amount of Time Searching

Increased time spent searching for areas of high pollock catch and low Chinook salmon PSC at the beginning of each trip, following tows, and following a move within the trip to new fishing grounds could suggest that Chinook salmon PSC measures and IPAs are effective. For catcher processors and motherships, VMS data coupled with observer data will be the primary source of evidence that time spent searching has increased. A major factor affecting the accuracy of estimates of the time spent searching is being able to discern when searching is taking place and when a vessel is transiting. This may be particularly true at the beginning a trip or if a vessel is making a pre-determined move to new fishing grounds. It may be tempting to assume that if a vessel is between tows and is not undertaking a significant move to new grounds, then it must be searching—but this may not be true. For example, assume a vessel makes a tow due north for ten miles; then runs due south for ten miles, followed by 30 minutes of circling about before it drops its net and begins towing due north once again. In this case, it is likely that only 30 minutes was spent searching between tows. While we believe it is likely that vessels will increase the time they spend searching for fish, accurate estimates of the time spent searching may be difficult to obtain. VMS information coupled with observer data will allow a measure of the amount of time that a vessel spends between tows, regardless of whether they are actually searching for fish or running to a known starting location. The total amount of time between tows is likely to be an indicator of search time, but will be subject to the constraints of the VMS reporting interval and assumptions about searching behavior.[14] Attributing this searching time is to avoid Chinook PSC (or locate pollock) will require some conjecture. For catcher processors and motherships , examining catch rates and PSC rates may reveal the motivation for searches in some instances.

Shorter and Smaller Tows

It is expected that vessels will make shorter and smaller tows, if they are trying to keep Chinook salmon PSC to a minimum. Shorter and smaller tows will allow greater certainty of catch composition for the

[14] It is possible that through collaboration with observers, fisheries analysts would be able to refine their algorithms to differentiate between short transits between tows and time spent searching.

operator. Observer data provides accurate and reliable information on towing times and distances traveled while towing. Observer data also provides accurate and reliable information on the size of each tow. A statistical analysis can be used to assess the distribution of tow lengths and tow sizes, and whether the distribution changes after implementation of Amendment 91. Whether or not shorter/smaller tows are accurate and reliable indicators of efforts to reduce Chinook salmon PSC remains an open question, but one that could be tested empirically using historical data, and qualitatively through further discussions with members of industry. If vessels do in fact utilize shorter/smaller tows when there are a lot of Chinook on the grounds, then their continued use of shorter/smaller tows when there are few Chinook on the grounds may be an indication that the IPAs are effective in providing incentives for vessels to reduce Chinook salmon PSC.

Increased Monitoring of the Number of Salmon Caught within Each Tow

Developing accurate estimates of the number of Chinook in a tow appears to be a critical issue for CVs trying to reduce Chinook salmon PSC. CVs unable to accurately estimate Chinook salmon PSC are much more likely to repeat the tow and incur even more Chinook salmon PSC. Unfortunately, information regarding increased levels of monitoring of Chinook salmon PSC by vessel operators will be anecdotal in nature. It is possible that AFA co-op reports will include summaries of improved monitoring steps that have been taken, and examples will likely be reported in the annual IPA reports. It is also possible that information may be provided by observers when they document the fish handling systems of vessels. For example, if a vessel uses a video camera to monitor Chinook as they flow from the codend to the hold, it is likely it will be reported in the observer's log. However, even if monitoring efforts are reported in logbook notes these data are not generally entered into an electronic database and may not be accessible to researchers. Currently there does not appear to be a way to accurately and reliably report on bycatch monitoring systems employed by vessels. Increased bycatch monitoring by vessels may be one of the more important changes employed to reduce Chinook salmon PSC. Information documenting these efforts and their relative success will provide an indication of the effectiveness of the IPAs. Further information on what approaches have been effective may be used by other vessels in enhancing their own monitoring systems.

Increased Number of Successive Tows over the Same Grounds

If a vessel operator finds an area with few Chinook, it is likely they will continue to tow over the area as long as pollock CPUEs are acceptable. Combined with short tows and increased monitoring, this appears to be an operating mode that could result in lower Chinook PSC. It is likely that VMS and Observer data could be used to estimate increases in the frequency of successive tows over the same grounds. It should be noted that to the analysts' knowledge no studies have been undertaken to determine whether shorter tows over the same grounds is correlated with lower Chinook PSC compared with longer tows over new grounds. In any case, it is likely that analysts will have to specify parameters that define whether successive tows are in fact over the same grounds.

Increased Numbers of Movements to Avoid Salmon

VMS and Observer data may be used to infer the number and distance of non-fishing vessel movements within a trip. Analysts will need to establish parameters that define whether or not a vessel has moved, but once those parameters are set, generating statistical inferences on vessel movements is possible.

The question of whether a vessel has moved to avoid salmon, or for some other reason, may also be difficult to ascertain, unless such moves were mandated by a RHS. It is possible that statistical relationships can be established between observer data on the estimated number of salmon within a tow and vessel movements that have been inferred from VMS/observer data. Statistical relationships between high (observed or estimated) Chinook PSC tows and vessel movements can lead to inferences about whether the move was made to avoid Chinook salmon PSC. For catcher processors and motherships, the combination of defining movements using a set of consistent (if somewhat arbitrary) criteria, and

observer data on bycatch in tows prior to the move may prove to be reasonably accurate and reliable. For catcher vessels, estimates will be less precise, as catcher vessel PSC can only be estimated at sea; however, observer samples together with VMS data may provide some insight into these moves made to avoid PSC.

Individual Behavioral Changes Related to Hot Spot Areas
The current RHS program gives vessels that have very low levels of Chinook salmon PSC the choice to continue fishing in the closed areas. If IPAs continue to allow "exempt vessels" to participate in closed areas under Amendment 91, then observer data coupled with the IPA reports will most likely provide sufficient information to determine which vessels have the option to continue fishing in the closed areas, and the level of catches and bycatch within the closed areas. These estimates can be compared with the catches and bycatch of similarly situated vessels prior to the implementation of Amendment 91. In addition in post-Amendment 91 years, closed-area activities of "exempt vessels" in high-abundance years can be compared to closed-area activities of "exempt vessels" in low-abundance years. Differences between "exempt vessel" catch and Chinook salmon PSC may be an indicator of the effectiveness of the IPAs in providing additional incentives to keep Chinook salmon PSC low even in low Chinook encounter years. The catches and Chinook salmon PSC of exempt vessels in closed areas is likely a useful indication that the IPAs are generating additional incentives for low Chinook salmon PSC vessels to continue to reduce Chinook salmon PSC. In considering these data, analysts can assess both the willingness of these vessels to avoid areas of known high Chinook salmon PSC, as well as the ability of low Chinook salmon PSC vessels to continue to fish in closed areas using their own bycatch avoidance measures to maintain low levels of Chinook salmon PSC.

2.3.2.4 Ability of Alternative 1 Data to Measure Unintended Consequences

This section assesses the ability of the status quo data sources that will be available under Amendment 91 to measure unintended consequences of the Chinook salmon PSC reduction measures.

Systematic Spatial Shifting of Effort
The expected geographic shift in effort is seen as an unintended consequence of efforts to reduce Chinook salmon PSC. While it is expected that over the long run there will be a systematic spatial shifts in effort, it is less clear which areas will see increases in effort. Areas of increased effort are likely to be determined only after vessels have sampled the grounds to determine that low Chinook salmon PSC levels will be found. It is somewhat more likely that we can predict areas that will have less activity. As shown in Figure 11, the area known as the "east-west tow of the horseshoe" has been an area of particularly high Chinook salmon PSC in the past that will likely see effort reductions. Using available data on the geographic location of catch, analysts should be able to identify systematic spatial shifts in effort.

Reductions in Average Pounds of Pollock Landed Per Trip by CVs
Shorter tows, more time searching, and greater distances from port may result in a reduction in the average pounds of pollock per trip by shore based CVs. This is more likely to occur if processors do not provide greater flexibility in the amount of elapsed time between the first tow and the time of delivery, but could occur even with changes in processor delivery standards.

Landings Report data in the CAS can be used to assess whether there have been systematic differences in the average size of landings. However, it is possible that other factors may contribute to changes in average size of landings. These other factors (such as TACs, seasons, and CPUEs) would need to be included in any statistical analysis. Systematic analyses of trip sizes, by vessels, since the implementation of the AFA would likely provide a useful baseline against which trip sizes that occur after Amendment 91 is implemented may be compared. Differences in trip sizes could be analyzed by season or month in which the fishery took place, vessel length, and cooperative, for example. Changes in trip sizes after

Amendment 91 is implemented may suggest that bycatch measures (including IPAs) are creating effective incentives for Chinook salmon avoidance.

Changes in the Distribution of Chinook Salmon PSC Rates

The Council's motion requests that analysts examine potential changes in the distribution of Chinook salmon PSC rates. It is implied that less variability in the distribution of Chinook salmon PSC rates and concentration of rates at the low end of the spectrum will be a useful indicator of Chinook salmon PSC avoidance efforts, particularly in the absence of an independent estimator of Chinook abundance on the fishing grounds. Changes in the distribution of Chinook salmon PSC rates on the tow basis for catcher processor and mothership sectors and the trip basis for shore-based catcher vessels may be assessed using currently available data. Provided other factors that could affect the distribution of Chinook salmon PSC (such as changes in the distributions of Chinook and pollock) are considered, examining the distribution of Chinook salmon PSC rates could be indicative of increased efforts to avoid Chinook salmon PSC. Concentration of Chinook salmon PSC rates at the lower end of the distribution may suggest that the fleet is focusing efforts in areas of known low Chinook salmon PSC, rather than finding higher (or midlevel) Chinook salmon PSC rates acceptable. Depending on the specific distribution, this concentration may also suggest that vessels are less willing to experiment in areas that are known to exhibit periodic higher Chinook salmon PSC rates, if an area with low rates is known.

Increases in Unharvested Pollock Remaining At the End of the Year

An increased willingness of pollock fishery participants to leave a portion of the fishery unharvested may also suggest that Chinook salmon PSC measures (including the IPAs) are effective. Observer data combined with landings reports provide reliable estimates of pollock harvests. While it may be more difficult to ascertain whether unharvested pollock amounts are significantly greater from a statistical perspective after implementation of Amendment 91—this will likely require several years of data.[15] The amount of unharvested pollock may be a useful indicator of the overall effectiveness of Amendment 91 in limiting Chinook salmon PSC.

Higher Overall Costs of Fishing

Many of the behavioral changes described above are likely to result in higher overall costs of fishing. In that sense, it may be inferred that costs have increased, but we do not have the tools to measure or reliably estimate the magnitude of such cost increases. Cost data for the AFA fisheries are not currently collected, and therefore estimates of cost increases under the status quo would be based either on cost models that may have already been developed or from new models that would most likely rely on key informant data.[16] The analysts are not aware of any comprehensive cost reporting of the BS pollock fishery more recent than the 1990 survey, conducted for the initial analysis of inshore-offshore. It is possible that the IPA reports will provide some indication of any higher costs that have accrued to the AFA sectors as a result of Amendment 91.[17]

[15] A statistical comparison of means requires at least two data points in each category, although inferences made using a very small number of data points are not very robust—one more data point added to the sample could easily change the inference. Thus, while it is possible to test whether the mean percentage of unharvested pollock after two years under Amendment 91 is significantly different from the mean percentage of unharvested pollock under AFA, it is very possible that the findings will differ if another year is added. In addition, it may be difficult to discern the cause of any such change and the extent to which it might be attributable to factors other than Amendment 91.

[16] If the number of key informants is kept to 9 or fewer (the level allowed by the US Office of Management and Budget—OMB) and the key informants are voluntarily participating, collection of key informant data can be undertaken without a formal analysis of the burden placed on informants by government agencies.

[17] It is also possible that some of the more significant factors in increased costs could be assessed under the status quo, without a formal regulatory change in data collection. For example, increases in fuel use are expected to be the key factor leading to higher costs for harvesting vessels. It may be possible to develop reasonably accurate

Lower Overall Levels of Product Quality and Lower Overall Levels of Revenue
Anecdotal evidence of lower overall levels of product quality and lower overall revenue per ton of pollock harvested could be provided in the annual IPA reports. Production Reports combined with wholesale prices from the COAR will provide more concrete data. These data can provide various levels of certainty depending on the shifts that occur. For example, if there is greater effort in June than there has been in the past, there may be a shift away from fillet production, and increases in surimi production and possibly in meal production because of generally low levels of flesh quality. Similarly, delaying fishing in the A season or harvesting of a portion of the A season TAC early in the B season might reduce roe production. These shifts may be discernible from Production Reports. However, a shift from high quality surimi to low quality surimi or from high quality roe to lower quality roe will not be discernible with existing data. Furthermore, because of the large number of factors that contribute to production decisions it may be difficult to attribute differences in product mixes or differences in revenues to Amendment 91.

Despite the concerns listed above, analysts should generate estimates of production and wholesale revenues and compare estimates from years prior to and years following implementation of Amendment 91. It may be possible, particularly after several years, to link changes in product mix and overall level of revenue to behavioral changes that occurred as a result of Amendment 91. While the quality of production data are generally good, there are several products for which the quality grade of the product is critically important in determining its value, and the current set of data forms do not include reports on quality grades. Surimi, fillets, and roe, in particular, are problematic—different levels of product quality yield significantly different values. Yet, some of these gaps may be filled through careful use of the data and close communication with participants.[18] Product and value data, as available under the status quo, provide useful information for assessing changes in quality and revenues, but are not without gaps. As indicated above, data on production by grade for surimi, fillets, and roe are not available from AFA processors. It is expected that the quality and amount of roe collected from the A season fishery may decline, due to the potential need to leave areas where high quality roe is being produced, in order to reduce salmon bycatch. While existing data sources may be used to estimate changes in roe production amounts, the data does not distinguish roe by quality. Therefore, the usefulness of estimates of roe product value before and after Amendment 91 is implemented will not be as useful as they could have been if better information on quality had been collected.

Additional Consolidation of the AFA Fleets
Both the AFA and IPA reports will indicate whether additional vessels have dropped out of the BS pollock fishery. If a vessel dropped out of the fishery as a result of Amendment 91, it is presumed that

estimates of fuel use for AFA vessels, using engineering-based or key-informant based studies. Northern Economics and NMFS-AFSC economists are currently collaborating on a similar project focused on the freezer longline fleet. The goal of that project is to obtain working estimates of fuel use rates that can be applied to VMS and observer data to generate an estimate of total fuel use.

[18] In 2007 NEI conducted a study of the surimi market for NMFS-AFSC (NEI, 2007). That project found that global prices for all grades of surimi were increasing, but that in some cases the average value per ton of surimi from AK production was declining. Through interviews with processors it was found that Alaska producers had been shifting from surimi to fillets and that much of the surimi production was now a much lower grade of surimi than it had been in the past. In addition, product recovery technology improvements have made it possible to extract greater amount of flesh from skin and carcasses—which also increase the amount of lower grade surimi. Therefore, while global prices of surimi increased, AK production mix of surimi was shifting from generally higher grades to a much larger proportion of lower grade. While casually examining data might have suggested that AK producers were unable to take advantage of the price increases for surimi, a more complete examination suggests that producers were, instead, achieving greater benefits by focusing production efforts on the even higher valued fillet market.

the IPA reports will provide some indication of the cause. Landings reports will also show the lack of activity, but will not provide any explanation as to why the vessel did not fish.

Our *a priori* assumption is that vessels that have repeatedly been among the vessels with the highest bycatch in the past are more likely to exit the fishery than vessels that have usually been able to avoid high bycatch, as the former vessels will need to incur greater costs to reduce their Chinook salmon PSC. Data available under Alternative 1 will not provide an indication of the additional costs incurred, but it will provide an indication of whether the vessel had been a high Chinook PSC vessel in the past. Information on consolidation of the fleet, particularly if it appears to be related to Chinook salmon PSC, should be useful to decision makers in measuring the effectiveness of Amendment 91.

2.3.2.5 Ability of Alternative 1 to Measure the Desired Results of Amendment 91

The Council took final action on Amendment 91 with the stated goal of reducing and limiting Chinook PSC in the BS pollock fishery. Any IPAs that might be developed under Amendment 91 should generate incentives that will be effective in reducing Chinook removals even when the abundance of Chinook on the pollock grounds is low. This section examines the ability of data available under Alternative 1 to measure changes that are a direct reflection of these desired results.

Transfers of Chinook PSC Allowances and Allocations of Pollock

The annual IPA reports could report transfers of Chinook PSC allowances. They could also report paired transfers of Chinook PSC allowances and pollock allocations. This information could be summarized at the vessel level, or could include details on individual transfers, including transfer prices. Currently, overall transfers of pollock allocations are reported in AFA cooperative reports, but each transfer of pollock is not independently reported.

It will also be possible, using observer data and landings reports, along with NMFS data on the exact allocation of pollock to each vessel, to infer that transfers of Chinook and/or pollock have occurred. It can be inferred that vessels that have used more Chinook than they were allocated or more pollock than they were allocated, must have been the recipients of transfers. Inferences beyond this level may be difficult. No data source under Alternative 1 will provide information on market prices of Chinook PSC allowances, other than the possibility that IPA reports may provide some information. While existing data will provide some information on the distribution of salmon and pollock among vessels, it is unlikely that they will provide detailed information, including prices of transfers of either Chinook allowances or pollock apportionments.

Create an Incentive to reduce Chinook PSC in Years of Low Encounters

If an IPA includes the concept of a SSIP as part of its additional incentives to avoid Chinook, then it is presumed that the IPA report will provide a full accounting of the vessel-by-vessel details of its utilization, both in terms of Chinook PSC used in the current year, and in terms of availability of Chinook PSC allotments based on prior years' Chinook PSC usage. In the IPA application to NFMS, the IPA should fully specify the rules for distribution of allowances of Chinook PSC. It also appears that it will be in the best interest of the IPA, if the rules concerning the distribution of Chinook PSC allowances and the use of Chinook PSC are transparent so that an independent analysis of the program can be undertaken without the need to acquire additional data from the IPA.

A SSIP-like program will create real opportunity costs when low Chinook PSC vessels are faced with a decision to transfer their unused Chinook PSC. If there is no benefit from unused Chinook PSC and the vessel has already utilized its pollock for the year, it may be willing to accept a relatively low price for its remaining Chinook PSC allowance. If the same situation were to occur, but the low Chinook PSC vessel had the opportunity to benefit from saving a portion of the unused Chinook PSC by receiving a relatively larger allowance in a future year, then the low Chinook PSC vessel will likely require a higher price to

induce a sale. From this perspective, the amount of Chinook PSC that is saved under such a program in a year in which there is real demand for Chinook PSC allowances (i.e. high encounter year) will be an useful indicator that the IPA is providing effective incentives to reduce encounters.

In low encounter years, it is unlikely that high Chinook PSC vessels will need to acquire additional Chnook PSC allowances—they will be able to use their own. However, the more allowances that are saved in a low encounter year, the more that will be available in the following year. From this perspective, an SSIP-like program will impose an opportunity cost on high Chinook PSC vessels. Rather than harvest pollock without regard for Chinook PSC, the opportunity to benefit from a larger Chinook PSC allowance in the next year should bring about additional caution. Assuming the SSIP program is fully specified and that an independent assessment of the program would not require additional data from the IPA, it is probable the existing data can produce accurate and reliable estimates of its use. The avoidance of Chinook PSC under an SSIP-like program in years of high Chinook encounters may be a useful indicator of the effectiveness of the IPA at further incentivizing the reduction of Chinook PSC. Although less certain, in low encounter years the effectiveness of the IPA may be assessed by saving Chinook PSC allowances, since saving are likely important to ensuring future harvest opportunities.

Use of Additional Performance Based Penalties or Payments

If an IPA includes additional performance based penalties or payments such as those envisioned in the FIP, it is presumed that the IPA will provide a full accounting of the vessel-by-vessel details, both in terms of the ways in which the performance was measured and in the penalties incurred or bonuses awarded.[19] Since the IPA has to petition NMFS for approval to operate, the details of the IPA's performance index will be known to the agency. It is also likely (although not certain) that using a combination of observer data and landings reports, analysts will be able to duplicate the vessel-by-vessel calculations used by the IPA. It is less likely however, that data will be available to independently verify whether penalties were actually paid by vessels or whether bonuses were actually awarded. It is presumed that measures that will be used in any performance index will utilize data that are generated in the status quo data collection system, and that they therefore can be independently assessed and analyzed. From this perspective the data going into the performance index are likely to be accurate and reliable. However, the question of whether the performance index that is developed will accurately and reliably reflect the goals of the IPA and ultimately the Council in terms of Chinook PSC avoidance will depend on the actual index developed. In any case, a report showing vessel ranking in terms of the performance index is likely to provide useful information for assessing the effectiveness of the IPA in creating additional incentives for salmon avoidance.

Lower Chinook PSC Rates and Totals

Chinook PSC totals and rates can be measured and assessed using observer and CAS data. It is presumed that the annual IPA reports will also provide summary data and other information that may not be available through the existing data collection program. Assessing the extent to which salmon PSC changes are caused by Amendment 91 or the IPAs is more challenging, since estimates of the abundance and distribution of Chinook on the pollock fishing grounds are limited. Observer data and Landings Reports will be the primary tools in measuring Chinook PSC rates and totals. With these data it may be possible to accurately assess Chinook PSC rates and totals by a number categorical variables (such as vessel size, season, distance from port, and pollock harvest). Reports documenting Chinook PSC and such categorical variables would undoubtedly be useful for documenting changes in Chinook PSC rates and totals and would provide indications of the effectiveness of the IPAs.

[19] In the remainder of this section, this type of performance based system is referred to as a performance index.

2.3.3 Evaluation of the Overall Quality of Alternative 1 Data

In general, the data that will be available under Alternative 1 is of very high quality and will provide analysts with the ability to accurately and reliably assess changes in Chinook PSC, changes in pollock CPUEs, temporal and spatial changes in effort, and many other behavioral changes that influence Chinook PSC. Key data sources available under Alternative 1 include Observer data, VMS data, Landings Reports, Production Reports, and COAR data. In general, these data may be combined and analyzed to provide accurate and reliable information that can be used to assess changes in fishing behavior following implementation of Amendment 91.

Two important components of the data that will be collected under Alternative 1 are the IPA applications that will be submitted prior to the fishing year, and the IPA reports that will be submitted after the fishing year. While these reports will be submitted by industry without independent verification, since IPAs must be authorized annually, it is presumed that they will be accurate and reliable to the extent that information is provided.[20] Reports could indicate pollock allocations and harvests of each vessel, the number of Chinook apportioned to and caught by each vessel, as well as a summary of transfers of Chinook PSC allowances. It is presumed that information on transfers will be aggregated on a vessel level—i.e. individual transfers will not be reported—but industry could provide disaggregated data. In addition, we expect that IPA reports will include information that is descriptive (and less quantifiable), but nonetheless important indicators of actions that have been taken to avoid Chinook PSC.

2.3.4 Costs to industry

Alternative 1 does not impose any additional costs on industry for data collection.

2.3.5 Costs to NMFS

Alternative 1 does not impose any additional costs or administrative burden on NMFS for data collection.

2.3.6 Summary and Conclusions

The data sources available under the status quo alternative provide analysts with the ability to answer a wide range of questions regarding Chinook PSC avoidance and the effectiveness of the incentives in Amendment 91. As noted earlier, the IPA reporting requirements could be clarified to ensure that the information needed to evaluate the programs is provided in the annual reports. In its June 2009 Chinook PSC data collection motion, the Council specifically requested that the status quo alternative be evaluated with respect to its ability to provide analysts with information to accurately and reliably answer seven key questions about Chinook PSC. In general, observer data combined with landings reports will allow analysts to address these seven specific questions to varying degrees. The status quo data sources available to answer each of the questions are discussed below.

(1) Comparisons of bycatch rates of vessels fishing simultaneously in different areas

For CPs, and for CVs delivering to motherships, observer data combined with landings reports may be used to make reliable comparisons of Chinook PSC rates of vessels fishing in different areas during the same period of time. These direct comparisons are not possible for CVs delivering to shore-based plants. For these deliveries, a full accounting of Chinook PSC occurs at the plant, and in most cases covers multiple tows made within a trip. Therefore, assignment of trip-level Chinook PCS data to specific tows and specific geographic locations would be estimates from sampled tows and trip bycatch accounting.[21]

[20] If an IPA knowingly submits an application or report that contains false information, the IPA could be subject to an enforcement action.

[21] The methodology used currently for CAS estimates simply assigns Chinook PSC in proportion to groundfish catch. That methodology is likely inadequate for making area based distinctions that would be sought for these analyses. Other methodologies could be explored in the future.

(2) Examining changes in the standard deviations of individual vessel bycatch rates
Observer data combined with landings reports will allow analysts to assess trends in the standard deviations of individual Chinook PSC rates by vessel, and across co-ops, sectors, or the entire AFA fleet. These changes in the distribution of Chinook PSC rates may provide an indication of the effectiveness of Chinook PSC measures, provided analysts carefully consider the influence of other factors that affect Chinook PSC rate distributions.

(3) Comparisons of individual vessel bycatch rates prior to and following changes in fishing locations
For CPs and CVs delivering to motherships, observer data combined with VMS data and landings reports will allow analysts to make accurate and reliable comparisons of individual vessel Chinook PSC rates prior to and following changes in fishing locations. For shore-based CVs, Chinook PSC rates at specific geographic locations within a shore-based CV trip must be estimated based on observer samples and trip level Chinook PSC accounting. Although NMFS will no longer officially assign Chinook PSC rates to geographic location within a particular trip for shore-based CVs, analysts may choose to make estimates based on the formerly used or alternative methodologies.

(4) Comparisons of individual vessel bycatch rates relative to distance traveled from port
For CPs, and for CVs delivering to motherships, observer data combined with landings reports will allow analysts to make reliable comparisons of individual vessel Chinook PSC rates relative to distance traveled from port. It is possible to make similar assessments for shore-based CVs; however, analysts must take into consideration the potential error in Chinook PSC assignments to specific geographic locations for shore-based CVs that fished in multiple areas during a trip. If geographic areas are defined as relatively large blocks, then the relative importance of the assignment error diminishes. In addition, relationships between Chinook PSC and willingness to travel from port on a trip basis may be examined.

(5) Estimates of salmon avoided through rolling hot spot closures
The concerns with the potential for misassignment of Chinook PSC to specific geographic areas for shore-based CVs (discussed above) raises concerns about the ability of existing data sources to provide reliable information on Chinook PSC that is occurring at the vessel's current location. Using this information to impute what might have occurred in areas that are no longer being fished is likely to render estimates of bycatch savings from RHS that are unreliable at best. In any case, the accuracy and reliability of such estimates will be highly dependent on analytical assumptions regarding bycatch rates in the closed areas after they were closed. It should not be construed that the inability to accurately estimate Chinook savings resulting from closing an area means that the RHS program should be curtailed or changed. According to Karl Haflinger of SeaState (2009), a comparison of trip to trip bycatch of vessels that leave a high bycatch area more often than not declines.

(6) Comparisons of the percentage of the TAC harvested at times of relatively high and low Chinook salmon encounter rates
Observer data combined with landings reports will allow analysts to make accurate and reliable comparisons of percentages of the TAC harvested at times of relatively high and low Chinook salmon encounter rates. However, it should be noted that there are no currently available means to determine "high and low Chinook salmon encounter rates" that are independent from the pollock fishery. In other words, the only information we have on the abundance of Chinook on the pollock grounds is through observations of bycatch.

(7) Comparisons of Chinook salmon bycatch rates achieved by vessels participating in an IPA and by vessels not participating in an IPA

If there are sufficient numbers of vessels that are not participating in IPAs, the data available under Alternative 1 will allow accurate and reliable comparisons of Chinook salmon bycatch rates achieved by vessels participating in an IPA, and by vessels not participating in an IPA.

2.4 Alternative 2

Under alterative 2, status quo data collection would be supplemented by collection of additional data concerning the distribution and transfer of Chinook PSC allowances and fuel usage to avoid Chinook PSC.

2.4.1 Description of the alternatives

Alternative 2 has two sub-alternatives, Alternatives 2A and 2B. Both Alternative 2A and 2B will collect data on transactions of Chinook PSC allowances and data on vessel movements related to Chinook PSC avoidance. In addition, under Alternative 2B, data on pollock transactions will be collected. The additional data would be collected under one of the two following options:

Alternative 2A

In addition to the status quo data sources:

(1) Transaction data for salmon – quantity and price of transfers (survey will be used to determine whether these are arm's length transactions). As defined by:

Option 1 – Transfer Ledger: All entities holding Chinook bycatch credits will track all transfers from the beginning of each year in an official ledger that would be submitted to NMFS at the end of the year.

Option 2 – Compensated Transfer Form: Require that IPAs and AFA Cooperatives summarize initial holdings of Chinook by vessels or other entities, and that they summarize all transfers regardless of whether the transfers were "compensated" transfers. For all "compensated" transfers, each party (transferor and recipient) must complete and submit to NMFS a Compensated Transfer Form. A transfer is "compensated" if there is an exchange of dollars (or any currency) for bycatch credits from one party to another.

(2) Information regarding change in fishing grounds:

Defined by the collection of estimated gallons of fuel burned in moving to the next fishing location when moving to avoid salmon bycatch

[To be used with existing information allowing examination of:

d. For both the original and new fishing grounds, the date, time, bycatch rate, location, and CPUE of tow.
e. Pollock quota remaining for harvest and salmon allowance remaining at time of event.
f. Time, distance, and use of fuel in searching for cleaner fishing grounds.]

Alternative 2B

In addition to the status quo data sources:

(1) Transaction data for salmon and pollock– quantity and price of transfers (survey will be used to determine whether these are arm's length transactions).

By expanding Options 1 and 2 from Alternative 2A to include pollock quota.

(2) Information regarding change in fishing grounds (as defined under Alternative 2B)

Because of the similarities between Alternatives 2A and 2B, the transaction options under 2A and 2B are discussed in one section, and vessel movements are discussed in another section.

2.4.2 Description of Data Collection under Alternative 2A and Alternative 2B

Under Alternatives 2A and 2B data describing transfers of Chinook PSC allowances (under 2A and 2B) or pollock quota (under 2B) and data describing fuel use to avoid Chinook PSC would be collected. These data could be used in conjunction with observer data showing pollock catch rates and Chinook PSC rates, as well as data concerning available pollock quota and Chinook PSC allowances. In addition, the analysis suggests that data could be collected concerning each vessel's estimate of its Chinook PSC. This additional data could be used to assess whether changes in estimated Chinook PSC contribute to the fleet's ability to avoid Chinook PSC.

Transfer of Chinook PSC allowances or pollock quota

Two options for tracking transfers. Under the first, a ledger form would be completed by any party to a transfer of Chinook PSC allowances (under 2A and 2B) or pollock quota (under 2B). Under the second option, IPAs or cooperatives would provide an accounting of all distributions and transfers of Chinook PSC allowances (under 2A and 2B) or pollock quota (under 2B) and any party to a transfer of Chinook PSC allowances (under 2A and 2B) or pollock quota (under 2B) that is compensated would specifically report on the terms of that transaction.

In their current form, both reporting options would collect only financial compensation. Financial compensation can be reported in a straightforward manner and provides a straightforward metric for comparing changes in value over time; however, several other valuable forms of compensation could be paid for a transfer, including pollock quota, gear or gear storage, other in-kind compensation, or undefined future consideration. Admittedly, any data collection omitting these forms of compensation could miss a substantial number of compensated transactions. Collection of these data was not included in the forms, as they could greatly complicate the forms increasing both the reporting and administrative burdens associated with this data collection. Specifically, reporting non-financial compensation would require a modified form, likely including a single form for each transaction that provides space for a full description of the compensation. Meaningful reporting of compensation would require that compensation is valued. Most analysts are likely poorly equipped to value the in-kind compensation, as few have the expertise to value the types of compensation that are likely to be paid. Quota and PSC allowance exchanges may be an exception, if a substantial number of arms length financial transactions occur. While data submitters could be required to provide an estimate of compensation value for non-financial compensation as a part of the reporting, in the absence of verification of those values, it may not be prudent to rely on those estimates. In addition, to obtain reasonable estimates, a report would need to be subject to a reasonable level of oversight and enforcement. Yet, effective oversight may not be possible. Estimated values may be subjective and some goods that could be exchanged (such as used gear or a priority position in a delivery order) may not be subject to market exchange from which to derive a market price. Other alternatives for reporting and valuing non-financial compensation may be explored in the future, if the Council wishes to pursue such collection.

An alternative could be to require any person participating in a transaction involving any form of compensation (including future undefined compensation) to complete a ledger form, but only require that financial compensation be specifically reported. A check box could be used to indicate whether compensation, beyond any financial compensation reported on the form, was included in the transaction. This approach would ensure that the number of compensated transactions could be quantified, even if the value of compensation were unavailable. If the Council wishes to pursue this approach, it could specifically include such a reporting requirement in its preferred alternative.

Option 1– Track All Transfers via Ledger Form

The ledger form would be used by each vessel owner or entity holding pollock quota or salmon credits to report each transaction to which it is a party. The form would identify the quantity of Chinook PSC allowances transferred, the other party, and any compensation to or from that party. In addition, the form would track the relationship between the parties which would allow future analyses to estimate whether the transaction was arms-length. Figure 2-16 shows a sample ledger form appropriate for Alternative 2A. Figure 2-17 on the following page shows a sample ledger for Alternative 2B. On this form, all transfers of Chinook PSC allowances would be reported as well as all transfers of pollock quota.

Information provided by this data include:

- A complete accounting of all transfers, including both compensated and uncompensated transfers; and in the case of Alternative 2B, paired transfers of pollock and Chinook as well as any non-paired transactions.
- The ability to analyze how historical per-season transfers change as the IPA program matures.
- The ability to analyze how ratios of compensated v. uncompensated transfers change as the program matures.
- The ability to study the distribution of Chinook PSC allowances in-season and over the long-term.
- The ability to analyze how paired and non-paired transfers change as the program matures in the case of Alternative 2B.
- The ability to determine which types of exchanges are most likely to be fair market value and to develop estimates of fair market value on a unit basis.

Chinook Bycatch Credit Transfer Reporting Form for All Transfers Including Those that do not Involve Monetary Compensation

Entity Name	Entity ID#	Entity Address	Entity Phone #	Entity Type (Check the Appropriate Box)					Salmon Bycatch Credits (#) at beginning of year	Check the box to the right if this form is a continuation from a previous form
				Co-op	IPA Manager	Company	Vessel	Other		☐
				☐	☐	☐	☐	☐		

Name of the Other Entity Involved in the Transfer (See the list of registered entities at www.xxx.ccc)	Entity ID# (See the entitiy list at www.xxxx. ccc)	Direction of Transferred Shares (Circle In / Out)		Transfer Date (MM/DD/YY)	Salmon Bycatch Credits Transferred (Number)	Indicate any Monetary Compensation (in US $)	Is the Value of the Compensation the Fair Market Value? (Circle Yes / No)		Circle the transaction type (see list at the bottom of this page) that best describes the entites involved in this transfer.			
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4

Space for Legal Statement about Submittal of Data and Signature Requiments	______________________________ *Signature*	______________ *Date*

Transaction Types			
Transaction Type 1: Between Two Entities Which Are Affliated as Defined by AFA.	Transaction Type 2: Between Two Entities in the Same Cooperative but not Affiliated as Defined by AFA.	Transaction Type 3: Between Two Entities in the Same Sector but not Affliated as Defined by AFA or in the same Cooperative.	Transaction Type 4: Between Two Entities not part of the Same Sectoror or Cooperative, or Affliated as Defined by AFA.

Figure 16. Option 1 Ledger Form for Alternative 2A

Pollock Quota and Chinook Bycatch Credit Transfer Reporting Form for All Transfers Including Those that do not Involve Monetary Compensation

Entity Name	Entity ID#	Entity Address	Entity Phone #	Entity Type (Check the Appropriate Box)					Pollock Quota (MT) at beginning of year	Salmon Bycatch Credits (#) at beginning of year	Check the box to the right if this form is a continuation from a previous form
				Co-op ☐	IPA Manager ☐	Company ☐	Vessel ☐	Other ☐			☐

Name of the Other Entity Involved in the Transfer (See the list of registered entities at www.xxx.ccc)	Entity ID# (See the entitiy list at www.xxxx. ccc)	Direction of Transferred Shares (Circle In / Out)		Transfer Date (MM/DD/YY)	Pollock Quota Transferred (MT)	Salmon Bycatch Credits Transferred (Number)	Indicate any Monetary Compensation (in US $)	Is the Value of the Compensation the Fair Market Value? (Circle Yes / No)		Circle the transaction type (see list at the bottom of this page) that best describes the entites involved in this transfer.			
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4

Space for Legal Statement about Submittal of Data and Signature Requiments

Signature _______________ *Date* _______________

Transaction Types			
Transaction Type 1: Between Two Entities Which Are Affliated as Defined by AFA.	Transaction Type 2: Between Two Entities in the Same Cooperative but not Affiliated as Defined by AFA.	Transaction Type 1: Between Two Entities in the Same Sector but not Affliated as Defined by AFA or in the same Cooperative.	Transaction Type 4: Between Two Entities not part of the Same Sectoror or Cooperative, or Affliated as Defined by AFA.

Figure 17. Option 1 Ledger Form for Alternative 2B

Option 2— Track Transfers via Annual IPA Reports and Compensated Transfer Forms
The second option comprises two components: 1) a summary report of initial allocations and transfers will be required of each IPAor cooperative that manages Chinook PSC allowances (under 2A and 2B) and pollock quota (under 2B); and 2) a compensated transfer form which would be completed and submitted to NMFS by each party to a transfer in which some form of monetary compensation is paid.

The impetus behind this option was the suggestion that the distribution and transfer of Chinook PSC allowances and/or pollock quota could be complicated by the IPA and cooperative structure in the fishery. For example, several ledger reports could be needed to document a single exchange between two vessels could include several transactions as Chinook PSC allowances and pollock quota pass from one vessel through multiple cooperatives and IPAs to another vessel, since a separate ledger entry would be required for each such transaction. In addition, it is possible that compensation would flow directly between vessel owners (rather than through intermediaries in the transaction). Determining whether reporting errors occurred may be very difficult, if compensation is reported for only one party to a ledgered transaction (since the payment might be made to another vessel owner, who is not a direct party to the transaction reported in a ledger with an intermediary.

To avoid this complexity, this alternative would require IPAs or cooperatives that oversee pools of quota or allowances distributed among participating vessels to provide a more comprehensive (yet specific) description of the distribution and exchange of quota and allowances among its members and between itself and outside parties. Supplementing this IPA and cooperative reporting with direct reports of compensated transfers would allow analysts to examine the flow of compensation among participants in the fisheries. Requiring each person paying or receiving compensation in exchange for quota or allowances would allow better tracking of the trading of these privileges.

Under Alternative 2A, IPA reports (or AFA cooperative reports, if a cooperative is overseeing Chinook PSC allowances in the absence of an IPA) would include the initial (and any subsequent) distribution of Chinook PSC allowances among vessels (or entities). In addition, the IPA (or cooperative) would report on exchanges of Chinook PSC allowances by any member entity (including exchanges with non-members). For each transfer (or distribution), the summary report should indicate: transferor, recipient, date, number of allowances transferred and whether or not monetary compensation was a part of the transfer.[22]

Establishing a specific regulatory reporting requirement for this alternative could be complicated by the vagaries of IPA and cooperative structures. For example, an IPA structure that assigns Chinook PSC allowances to vessels as PSC is used may report in a very different manner from an IPA that distributes Chinook PSC allowances at the beginning of the year and oversees transfers within the IPA and with other IPAs throughout the year. Consequently, this option would establish a general reporting requirement for IPAs and cooperatives, but would not specify the form of the report.

In addition to the IPA (or cooperative) report, any party engaged in a transfer of Chinook PSC allowances in which monetary compensation occurs would be required to submit a compensated transfer report identifying the party paying and the party receiving compensation and the amount of Chinook PSC allowances transferred in exchange for that compensation. The ledger form used for option 1, with a modification to indicate the form is only required for transactions for monetary compensation, could be used for this purpose.

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Under Alternative 2B, the IPAs (or cooperatives) would be required to report distributions and transfers of Chinook PSC allowances and parties to compensated transfers of Chinook PSC allowances would be required to report those transactions, as required under Alternative 2A. Alternative 2B adds a parallel reporting requirement for pollock quota, under which cooperatives would be required to report the initial (and any subsequent) distribution of pollock quota and any transfers by its members (including transfers to non-members). In addition, any party to a transfer of pollock quota in which monetary compensation occurs would be required to submit a compensated transfer report that identifies the party paying and the party receiving compensation, as well as the amount of pollock quota transferred in exchange for that compensation. This form could also be a modified version of the ledger form required under option 1.

Chinook Bycatch Credit Transfer Reporting Form for Transfers that Only Involve Monetary Compensation

Entity Name	Entity ID#	Entity Address	Entity Phone #	Entity Type (Check the Appropriate Box)					Check the box to the right if this form is a continuation from a previous form
				Co-op	IPA Manager	Company	Vessel	Other	☐
				☐	☐	☐	☐	☐	

Name of the Other Entity Involved in the Transfer (See the list of registered entities at www.xxx.ccc)	Entity ID# (See the entitiy list at www.xxxx. ccc)	Direction of Transferred Shares (Circle In / Out)		Transfer Date (MM/DD/YY)	Salmon Bycatch Credits Transferred (Number)	Indicate any Monetary Compensation (in US $)	Is the Value of the Compensation the Fair Market Value? (Circle Yes / No)		Circle the transaction type (see list at the bottom of this page) that best describes the entites involved in this transfer.			
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4
		In	Out				Yes	No	1	2	3	4

Space for Legal Statement about Submittal of Data and Signature Requiments	______________________________ *Signature*	______________ *Date*

Transaction Types			
Transaction Type 1: Between Two Entities Which Are Affliated as Defined by AFA.	Transaction Type 2: Between Two Entities in the Same Cooperative but not Affiliated as Defined by AFA.	Transaction Type 3: Between Two Entities in the Same Sector but not Affliated as Defined by AFA or in the same Cooperative.	Transaction Type 4: Between Two Entities not part of the Same Sectoror or Cooperative, or Affliated as Defined by AFA.

Figure 18. Compensated Transfer Ledger for Alternative 2A

Pollock Quota and Chinook Bycatch Credit Transfer Reporting Form for Transfers that Only Involve Monetary Compensation

Entity Name	Entity ID#	Entity Address	Entity Phone #	Entity Type (Check the Appropriate Box)					Check the box to the right if this form is a continuation from a previous form
				Co-op	IPA Manager	Company	Vessel	Other	☐
				☐	☐	☐	☐	☐	

Name of the Other Entity Involved in the Transfer (See the list of registered entities at www.xxx.ccc)	Entity ID# (See the entitiy list at www.xxxx. ccc)	Direction of Transferred Shares (Circle In / Out)		Transfer Date (MM/DD/YY)	Pollock Quota Transferred (MT)	Salmon Bycatch Credits Transferred (Number)	Indicate any Monetary Compensation (in US $)	Is the Value of the Compensation the Fair Market Value? (Circle Yes / No)		Circle the transaction type (see list at the bottom of this page) that best describes the entites involved in this transfer.			
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4
		In	Out					Yes	No	1	2	3	4

Space for Legal Statement about Submittal of Data and Signature Requiments	*Signature*	*Date*

Transaction Types			
Transaction Type 1: Between Two Entities Which Are Affliated as Defined by AFA.	Transaction Type 2: Between Two Entities in the Same Cooperative but not Affiliated as Defined by AFA.	Transaction Type 1: Between Two Entities in the Same Sector but not Affliated as Defined by AFA or in the same Cooperative.	Transaction Type 4: Between Two Entities not part of the Same Sectoror or Cooperative, or Affliated as Defined by AFA.

Figure 19. Compensated Transfer Ledger for Alternative 2B

Collection of Data on Changes in Fishing Grounds under Alternatives 2A and 2B

Alternatives 2A and 2B both contain the same language requesting the development of methods to track fleet movements associated with Chinook PSC avoidance. The language indicates that these methods should allow analysts to distinguish between original and new fishing grounds and identify the date, time, Chinook PSC rate, location, and CPUE of each tow. In addition, the motion requests that data be provided that allow the analysts to identify the time, distance, and an estimate of fuel used in searching for cleaner grounds, along with the pollock quota and Chinook PSC allowances remaining after the move from the original location to the new location.

As discussed in significant detail in Alternative 1, data on much of the information needed to assess movements described in the preceding paragraph is currently available. However, the precision of the information varies significantly between data collected from CPs and mothership operations and data collected from shore-based CVs. For CPs and mothership operations all of the requested information is already available in the CAS from observer data landings reports and VMS data with two exceptions: (1) data specifying when a move has been made in an effort to reduce Chinook PSC, and (2) the amount of fuel use in searching for clean fishing grounds. On CPs and motherships, observers report total pollock catch and the total Chinook PSC for each tow. Catcher vessels are not usually configured to allow observers to count each fish as they are on CPs and motherships. Therefore, accurate and reliable estimates of Chinook PSC on a tow-level shore-based CVs do not currently appear attainable. Observers in all operations (CPs, Motherships and shore-based CVs) are able to make reliable (if not always completely accurate) estimates of the total weight of each tow. They are also able (along with VMS data) to accurately report the towing times, and geographic coordinates of starting and stopping locations of each tow. Thus, with the exception of estimates of tow-by-tow Chinook PSC on shorebased CVs[23], the primary barrier to meeting the Council's data request appears to be data indicating when a move from the original fishing location to a new fishing location has taken place, along with information on how much time, distance, and fuel were used in searching for and moving to cleaner fishing grounds. To address this shortcoming, this alternative would create a marker which will identify moves that are primarily related to salmon bycatch and will collect data on the cost of those moves as measured by fuel, time, and distance. The method involves the addition of a single column to the current logbook form. An example of the reformatted logbook for CVs is shown in Figure 20—the additional column is shaded. Similar changes would be made in logbook forms for CPs and for motherships.[24]

The logbook directions would instruct vessel operators to enter the amount of additional fuel they spend looking for cleaner fishing grounds when they change fishing locations due primarily to Chinook PSC. The operators would enter the number of fuel gallons spent searching for and transiting to the new location in a cell located in the row for the first haul at the new location. The observer onboard would then record this information into their data. This fuel use marker would then be visible within the observer data not only signaling that a Chinook PSC related move occurred, but also the indicating amount of fuel used in making the move. If the observer data is then linked with the VMS data showing vessel movements, the time and distance used in the move should then become visible to the analyst. Assuming

[23] In developing this data collection initiative, the Council indicated that it did not intend to revise the collection of catch data by observers, as defined under Amendment 91. Consequently, any change in observer estimates of Chinook PSC are beyond the scope of this action.

[24] A mechanism to enable observers stationed on motherships to capture data from CVs in the mothership operation would need to be developed. It may be feasible for each of the CVs in the operation to send the fuel use information to the observers on board the mothership via facsimile or other electronic means.

that other movements can be distinguished from the VMS data without additional movement indicators, the analyst can determine how Chinook PSC and those other moves differ.[25]

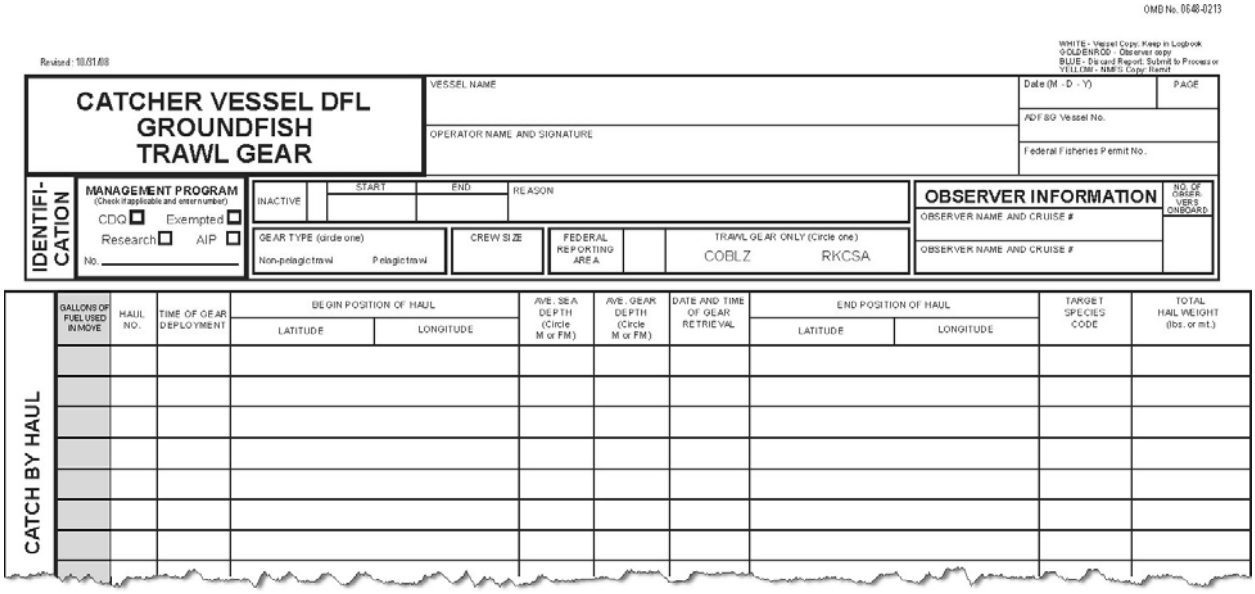

Figure 20. Example Change to Logbook to Record Chinook Related Vessel Movements and Fuel Use

Potential Methods for Reporting an Operators Estimate of Tow Level Chinook PSC

Although the observer program collects detailed information concerning Chinook PSC, specific observer Chinook counts may be unavailable to vessel operators during their fishing trip. For example, a catcher vessel needs to wait until all of its catch is observed at a processing facility prior to knowing the exact number of salmon caught during a trip. Despite the absence of real time observer counts, vessel operators have some degree of knowledge concerning levels of Chinook PSC throughout their fishing trip. For example, a vessel operator may instruct crews to count Chinook during the transfer of fish into its hold and may process the transfer in a particular manner to allow better observation of the number of Chinook. Vessel operators' efforts to avoid salmon in the future depend greatly on the accuracy of these estimates. Underestimation of Chinook PSC could result in a vessel continuing to fish in an area of relatively high Chinook PSC; overestimation of Chinook PSC could result in a vessel moving from an area of acceptably low Chinook PSC to an area with greater risk of Chinook PSC. In addition, for Chinook PSC management measures to be successful, vessel operator estimates of Chinook PSC rates should closely parallel actual rates.

Among the potential shortcomings of existing data on Chinook PSC is any information concerning the perceived levels of Chinook PSC and how they compare with actual levels. To improve its understanding of whether Chinook PSC measures (including IPAs) are having their intended effect, **the Council could**

[25] As an alternative to collecting specific fuel usage for each move, the Council could consider collecting average fuel use in different operational modes (e.g., transiting and fishing). These data could then be applied in conjunction with reporting on moves to avoid Chinook PSC to derive estimated fuel usage to avoid PSC. Although this approach might provide less accurate estimates of fuel usage for any specific move, it would provide data that can be more appropriately applied to other activities of the vessel. These data are requested under alternative 3, which provides a more complete analysis of those other possible uses. In the case of catcher processors, it is possible that average fuel costs might prove adequate, as isolating fuel usage associated with a move could prove very difficult. A vessel may be using fuel in processing operations while moving, so attributing the fuel use specifically to the move might be excessive.

direct the collection of vessel operator estimates of Chinook PSC on a tow-by-tow basis. Such a collection could require each shore-based catcher vessel and catcher processor operator to report its estimate of Chinook PSC from a tow prior to initiating its next tow. The requirement could be implemented by requiring the vessel operator to communicate to the observer the estimate in a timely manner. Using these data, it is possible that analysts could assess the extent to which Chinook PSC may be unavoidable, as a result of poor (or misperception of) information concerning Chinook PSC rates. These estimates could be reported in the vessel logbook and migrated into the observer database. An analysis of the vessel's estimates over the entire trip and observer counts could be used to determine the reliability of the vessel Chinook PSC estimates.[26] If Chinook PSC measures are effective, vessel estimates might be expected to improve over time. An example of the potential change in the logbook that would be required for these additional data is shown in Figure 21. The shaded column on the right would be used for the vessel's estimate of Chinook PSC.

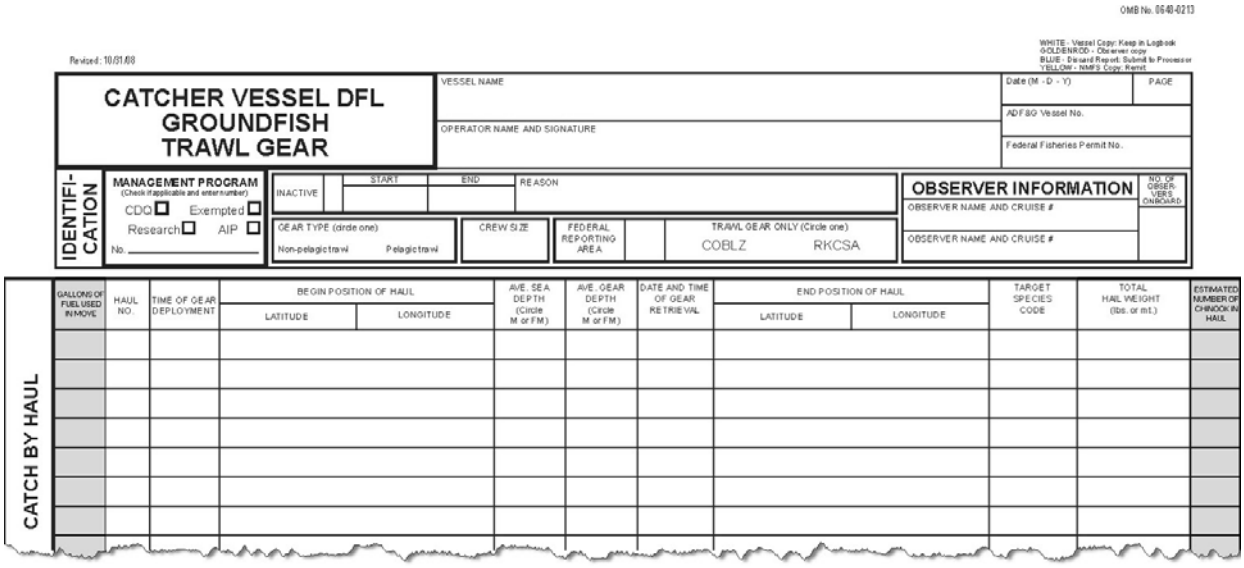

Figure 21. Example Changes to Logbook to Record Estimates of Chinook in Each Haul.

Although catcher processor operators will have access to information on Chinook PSC levels as their catch is processed, it is possible that a tow could be started prior to observer counts being completed. In this instance, the operator's decision to fish would not be based on the observer count, but the operator's estimate. That estimate could be based on a partial count by the observer (or vessel crew) or a sample. In any case, it is the operator's estimate that would affect the fishing decision (as opposed to the observer count that might be unavailable). Catcher vessels delivering to motherships will not have any information on the composition of a specific tow until it is delivered and censused by an observer on board the mothership. These vessel operators could base estimates on previous tows, or information about tows by other vessel operators delivering to the same mothership.

The potential for operators to misreport their estimates is not known. These estimates are clearly subjective. Yet, it is unclear what a vessel operator might gain from misreporting an estimate. Any deviation of an estimate from observed bycatch would make the operator appear unable to accurately estimate Chinook PSC. Intentional underestimation of Chinook PSC could be used to give an appearance of low Chinook PSC in a particular area, and vice versa for intentional overestimation. Since reports are delivered only to agency staff, who cannot make regulatory closures based solely on these estimates, it is

[26] For comparison purposes, estimates would be summed across a trip for catcher vessels and compared to trip level observer Chinook PSC counts.

unlikely that misreporting could be used to avoid closure of an area. Nonetheless, the potential for misreporting should not be dismissed and should be given further attention, if this data collection is implemented.

These data could be used for several purposes, most of which should provide information concerning the effectiveness of Chinook PSC measures (including any IPAs). Analysts and fishery participants can compare operator estimates to observed Chinook PSC to assess the extent to which vessel operators are able to accurately estimate their Chinook PSC. For catcher vessels delivering to shore-based plants, uncertainty will remain concerning accuracy, since catcher vessel estimates of bycatch will be at the tow level and observer data will be at the trip level. Yet, comparison of aggregated tows with trip observations will provide information concerning an operator's ability to accurately estimate bycatch. Most importantly, without accurate estimates, participants are unlikely to be able to effectively avoid salmon, remaining in areas with relatively high bycatch or moving from areas of relatively low bycatch. Pressure within cooperatives and IPAs could lead operators to give greater or more effective attention to their estimates. In addition, exchanges of information among fleet members could improve estimates.

Several aspects of the effectiveness of IPAs could be suggested by these estimates and their comparison to observed PSC levels. For example, differences in the accuracy of estimates throughout the season might suggest that operators are less attentive to Chinook PSC at certain times of the year (such as during periods of high roe recovery). The extent to which estimates vary from observed levels could also vary with pollock catch rates. Alternatively, if the difference between estimates and observed levels increases in years of low Chinook PSC, it could suggest that operators are less concerned with Chinook PSC, if overall caps or performance standards are not binding. Over time, improvements in estimates could suggest that IPAs (and bycatch management measures) are creating an effective incentive for attentiveness to Chinook PSC levels and avoidance.

Although improvements in estimates might be observed across the fleet, it is also possible that differences in the ability of vessels and vessel operators to accurately estimate Chinook PSC may persist. For example, smaller vessels with less deck space may not allow for as thorough inspection of catch as larger vessels that use belts to convey catch into holds. Correlation of these differences with fishing behaviors might suggest that operators less able to estimate Chinook PSC are using different measures to address these shortcomings. For example, it is possible vessels or operators with relatively weak estimates may enter fishing arrangements through cooperatives or IPAs to avoid fishing in areas until other vessels have determined the extent of Chinook PSC. Only after acceptable minimum Chinook PSC rates are known to be present would these vessels fish the area. Although these measures could be motivated within IPAs without regulatory involvement, it is possible that required reporting of estimated Chinook PSC could stimulate faster or greater fleet responses.

Reporting of these Chinook PSC estimates could be established in a manner similar to the reporting of vessel movements to avoid Chinook PSC. Data could be recorded in logbooks and later reported through the observer program. Logbook reporting would facilitate timely collection of information by the vessel operator, while the later transcription by the observer would simplify data management. The vessel operator would be required to report the estimate to the observer prior to commencing a tow, or the observer would simply report that no timely estimate was received. Implementation of this method would ensure that estimates are delivered in a timely manner (which may be critical on vessels that are capable of counting salmon, but elect to use estimates to determine whether to fish an area). In addition, this method of reporting would obviate the need for the development of separate reporting instruments, which could increase the potential for reporting errors that could make data difficult to track.

The burden of the collection of these estimates on the industry is expected to be relatively small, approximately 3 minute per tow for reporting (but not making the estimate). It is anticipated that vessels

participating in the fishery (and particularly those subject to IPAs) will be making these estimates regardless of any regulatory requirement; therefore, the estimated burden is only the burden of reporting. 98 vessels qualify as the inshore catcher vessels under the AFA. These vessels are estimated to have made a total of 4,157 tows in 2008. Each vessel is estimated to have made approximately 43 tows during the year. If reporting requires three minute per tow, the average vessel would require approximately two-and-one-quarter hours per year reporting these data. If catcher processors are required to report these data, their average burden would be greater (as average catches by these vessels is substantially greater). Catcher processors made 6,342 tows in the pollock fishery in 2008. If the reporting burden is divided equally among 19 catcher processors that qualify for the AFA, and each report takes 3 minutes, it is estimated that the average vessel would require approximately 17 hours annually to report these data.

To gain further information concerning Chinook PSC estimates, the Council could include additional questions in the skipper survey (described in Alternative 3) concerning the methods used for estimating Chinook PSC. Through these questions, the Council might gain insights into techniques used to accurately estimate Chinook PSC and potential methods to overcome obstacles to accurate estimation.

2.4.3 Evaluation of quality of data to be collected

Under **option 1 for tracking transfers**, the ledger form should provide the means to accurately and reliably track numbers of Chinook PSC allowances (under 2A and 2B) and pollock quota (under 2B) transferred and the parties to those transfers. Since all distributions and transfers would be reported using the same form, a uniform data set may be constructed across IPAs and cooperatives from these data. Although this uniformity may have appeal for simplifying analytical uses of the data, it is possible that it could mask underlying differences in the institutional structures of IPAs and cooperatives that are important to understanding the effects of the IPAs and cooperatives. Depending on the descriptions of transactions and distributions, it may be difficult to distinguish some transfers made by agreement of the parties to the transaction from distributions governed by the rules of an IPA. These uncertainties could affect use of the data.

The use of ledgers may also complicate attempts to fully understanding transactions, particularly for transfers that involve IPAs and cooperatives as intermediaries. It is possible that some transactions may be difficult to track, if an IPA or cooperative holds allowances or quota on behalf of members for a period of time before transferring them on. In addition, ledgers may prove misleading or difficult to prepare for some fishery participants, particularly when privileges are transferred to an intermediary and payments are received from a different party, who is the ultimate recipient of the transfer. In addition, it may be difficult to develop a form that allows for reporting in a manner that would enable analysts to understand the variety of exchanges that might be involved in a transaction with more than a single intermediary. It is possible that these complications could lead to unintentional incorrect or misleading reporting in some cases.

Under **option 2 for tracking transfers**, the IPA or cooperative reports should provide a clearer description of the structure of distributions and transfers of allowances and quotas than might be discernable under option 1. Having an overview of distributions and transfers may overcome some of the complications associated with ledgers tracking each movement of privileges. In addition, the generality of the reporting requirement (without a specific form) should provide some flexibility to IPAs and cooperatives to tailor their reports to the structure used for making distributions and transfers. On the other hand, the absence of a specific reporting form could create some uncertainty concerning the level of detail in reports and the comparability of reports across IPAs and cooperatives. Using a ledger only for recording compensated transfers may aid analysts in interpreting the structure of transactions that involve intermediaries or multiple parties, which may be difficult to discern under option 1 where all movements of privileges (including transfers to intermediaries) are reported in a ledger.

Determining the fair market value for shares could also be challenging, given the size and relationships of participants in the market. While the form does ask that transferees and recipients indicate whether a transfer is at fair market value and to indicate the relationship between the two parties, in a small market with ongoing interactions, it is possible that prices will be distorted by relationships and good will. To some degree these price effects could be neutralized, as managers and operators do have a fiduciary responsibility to their shareholders to obtain a fair market value for any of the firm's assets that are sold, and to pay no more than a fair market value for any asset purchase. Furthermore, because most of the vessels are structured as independent corporations, each firm will need to follow accepted accounting practices when reporting financial transactions.

Although accuracy of reports is likely to be similar for **Alternatives 2A and 2B**, the data under Alternative 2B may prove more useful as an indicator of market prices, particularly if transfers include both Chinook PSC allowances and pollock quota. In these cases, a fair market value transfer would need to consider the transfer of both types of privileges to correctly value those different privileges. Under Alternative 2A, pollock quota would not be included in the report, leaving analysts with incomplete information concerning the transaction. As a result, Alternative 2B likely provides for more complete and accurate reporting of Chinook PSC allowance prices.

Logbook **reports of vessel movements to avoid Chinook PSC** (made under either 2A or 2B)are likely to accurately reflect the vessel operator's perspective on whether the vessel moved due to Chinook bycatch reduction efforts. It should be noted that a decision to move may be related to many factors and whether a move is primarily related to Chinook PSC avoidance is quite subjective. Because of this subjectivity, some vessels may indicate a move is related to Chinook PSC avoidance, while another vessel under the same circumstances may not indicate the move was related to Chinook PSC avoidance. From this perspective, these data are not likely to be seen as perfectly reliable. The fact that the data may not be entirely reliable should not be construed as a conclusion that the data should not be collected. Rather, analysts will need to use the data with a full understanding of it limitations. It is possible that instructions for reporting whether a move is bycatch related can be made to limit the subjective nature of the data.

In general, vessel operators do not know precisely how much fuel is being burned at any given time. Many vessels now have fuel flow meters that make estimates of fuel use over time, but the reliability and accuracy of these meters is not well documented in the fleet. Some vessel owners have stated that estimates may be poor approximations of actual fuel consumption on the vessels. Vessels without flow meters will likely estimate usage based on average fuel usage (with possible adjustments for circumstances and conditions). In either case, estimates are likely to suffer from some unknown amount of error.

2.4.4 Analytical uses of the data

Data on transfers of pollock allocations and Chinook PSC allowances will be important to understanding the functioning of any IPAs and may be an important indicator of the effectiveness of Amendment 91 regardless of whether IPAs are formed. Alternative 2 attempts to collect information on two aspects of transfers: (1) the number, quantities of quota or allowances, and direction of transfers, and (2) the cost of transferred Chinook PSC allowances and/or pollock quota.[27] The number and direction of transfers may be an important indicator of the effectiveness of the incentives created by distributing Chinook PSC allowances among and within sectors. For example, few transfers may suggest:

- most vessels are able to harvest their pollock quota without needing additional Chinook PSC allowances;

[27] It is presumed that the reporting of all transfers of pollock quota will be also required under Alternative 2B.

- Vessels have made significant improvements in their ability to avoid Chinook PSC and do not need additional Chinook PSC allowances; or

- The IPA creates effective disincentives for the transfer of Chinook PSC allowances for use by others.

The direction of transfers may also be important. If transfers are flowing to low Chinook PSC vessels, it could be that the IPA's incentives are forcing vessels that cannot reduce PSC efficiently from the fishery at certain times. This conclusion may be reinforced, if these trades are occurring in years of low Chinook encounters. Note that if Chinook PSC allowances are flowing to low PSC vessels we would also expect that pollock quota is also flowing in the same direction. It is also possible that pollock quota without PSC allowances could flow from high PSC vessels to low PSC vessels, once the high PSC vessels have used their allowances.

On the other hand, if Chinook PSC allowances are flowing to high PSC vessels, then it can be assumed that the profitability of those vessels is such that even with the additional cost of their efforts to reduce Chinook PSC and the costs of buying additional Chinook PSC allowances, it is still more profitable for the owners to fish for pollock than to trade pollock to lower Chinook PSC vessels. In this case, pollock quota may not accompany the transfer of Chinook PSC allowances. Further study of the IPA's incentives may be appropriate to determine whether these transfers are increasing Chinook PSC usage.

The cost of transferred Chinook PSC allowances may also be an important indicator of the effectiveness of Amendment 91. In an active competitive market, the price of Chinook PSC allowances should be an indicator of the increment to each firm's net operating revenues that could be earned in the absence of the transaction. From the perspective of the buyer of Chinook PSC allowances, the price is an indicator that they can earn at least that much in additional net operating revenues by acquiring the allowances. Conversely, from the seller's perspective, the price of the allowances is at least as much as the amount of net operating revenues the seller could reasonably expect to generate if the seller kept the allowances.

Alternative 2B will not only collect data on the cost of purchasing additional Chinook PSC allowances, it will also collect data on the cost of acquiring additional pollock quota in the absence of additional Chinook PSC allowances and the cost of a joint transfer of both pollock quota and Chinook PSC allowances. Again, assuming a competitive market, a compensated trade of pollock quota should provide indications of the incremental net operating revenues generated from that amount of additional pollock. Similarly, a joint transfer of both pollock and Chinook PSC allowances provides an indication of the incremental net operating revenues that can be reasonably expected from the transferred quota and Chinook PSC allowances.

The specific uses of these data will depend, to some extent, on their quality and the level of richness. In the first instance, simple, more rudimentary analyses can be used to understand the operations of IPAs and cooperatives and the movement and use of pollock quota and Chinook PSC allowances in the fishery. These analyses are likely to use basic counts of transfers and simple statistics and qualitative analysis of data, at the vessel, cooperative, and IPA level, together with anecdotal evidence and other data from the fishery. This level of analysis may provide an understanding of the mechanical operation of the IPAs and cooperative rules and the incentives created by those structures. If the data prove to be of reliable quality and sufficient quantity, more rigorous, quantitative analyses may be undertaken to examine values of Chinook PSC and pollock quota and the incentives of the IPAs and the other measures adopted in Amendment 91.

In considering the proposed uses of these data, it is important to bear in mind that a critical element of Amendment 91 and the system of IPAs permitted by that action is the latitude those measures provide to industry to address Chinook PSC. IPAs are intended to allow flexibility to industry to develop innovative incentives to constrain Chinook PSC. In providing that flexibility, it is important that industry also provide information that can be used to verify the effectiveness of their actions. The collection of transfer data, in particular, is important to understanding the operation of IPAs, as they reveal access to PSC allowances. This access is fundamental to understanding both the effectiveness and effects of an IPA.

Data concerning **movements to avoid Chinook PSC** would be used to assess vessels' willingness to leave fishing grounds to avoid Chinook PSC. Using these data together with VMS and observer data should allow analysts to examine both individual vessel and fleet behaviors. In the first case, the tendencies of vessels to move from areas with high Chinook PSC and to search for areas with lower PSC rates. These data can also be used across cooperative fleets to examine the extent to which members coordinate searches to avoiding Chinook PSC. Fuel usage data under this alternative can be used to assess the extent to which fleet members are willing to incur those expenses to avoid Chinook PSC. Although these data are unlikely to have great precision or accuracy, they should provide useful estimates of fuel usage for avoiding Chinook PSC.

As with the transfer data, these data will likely be used initially for simple estimates of operational fuel costs that can be compared over time, sectors, IPAs, and cooperatives. These estimates will be used with other available data, including Chinook PSC rates and pollock catch rates to examine both the effectiveness and the effects of IPAs and the more general measures adopted under Amendment 91. Uses of these data may evolve from more basic data analyses to more quantitative estimates of the fuel costs of salmon avoidance under the IPAs and measures adopted under Amendment 91.

2.4.5 Other uses of the data

Some of the data that will be collected under Alternative 2 may have other potential uses. This section provides an overview of these potential uses.

Transfer data collected under Alternatives 2A and 2B may be used as predictors of overall net revenue after operating costs of fishing vessels. The amount that a buyer is willing to pay for additional Chinook PSC allowances should be no greater than the amount the vessel is likely to earn in net operating revenues from the purchase of those allowances. If the vessel would earn less in net operating revenues, then it would be better off selling its remaining pollock quota and exiting the fishery for the remainder of the year. Because of their direct link to the profitability of vessels, estimates of the fair market value of Chinook PSC allowances (or of pollock quota under Alternative 2B) will have the potential to be used in a many other applications, particularly in analyses of impacts of other proposed regulatory changes.

Data identifying **moves to avoid Chinook PSC** will provide analysts valuable insight into vessel operator's perspectives on the definition of a move regardless of its cause. Currently analysts must rely on anecdotal information and the analyst's own set of criteria to determine when a move has occurred. The applications of an improved criteria set for defining a move are not readily apparent, but it is certainly possible that the information may prove useful in other analyses. Estimates of **fuel used when moving** will provide analysts with useful information concerning fuel use in the fishery by a particular vessel. Given the variety of circumstances in the fishery, these data should prove useful for understanding variability of fuel usage, which can aid in assessing fuel costs more generally in the fishery.

2.4.6 Costs to industry

This section examines the costs to industry of compliance with the various reporting requirements that would be established by Alternatives 2A and 2B.

Completing the **transfer ledgers** under **option 1 for collection of transfer data** is believed to require approximately 15 minutes for the first transaction and 5 minutes for each subsequent transaction. The number of transactions is not known *a priori*. Each vessel should receive (and report) at least one distribution of both pollock quota (under 2B) and Chinook PSC allowances (under 2A and 2B). After this initial distribution, the number of transfers is uncertain and may depend on both conditions in the fishery and the applicable IPA and cooperative structure. For example, the number of transfers could be increased in years of high encounters, if some vessels run short of Chinook PSC allowances. Also, an IPA structures that makes periodic distributions and limits participants periodically may constrain participants and thereby contribute to a greater number of transactions. These uncertainties prevent any direct estimate of the total burden on any vessel or the fleet, as a whole.

Under **option 2**, IPA and cooperative managers must include a their **IPA and cooperative reports details on the distribution and transfer** of Chinook PSC allowances (under 2A and 2B) and pollock quota (under 2B), and for each transfer in which compensation is involved each entity involved will need to complete and submit a **compensated transfer form**.

The burden associated with the IPA and cooperative reports cannot be predicted, as that will likely depend on the structure of the IPA or cooperative and the rules applicable to distributions and transfers. A simple IPA structure that either directly limits or creates disincentives for transfers may have little associated reporting burden. On the other hand, a structure that either makes frequent distributions or favors transfers could have a substantial associated burden. In considering this burden, it should be noted that a structure with substantial disincentives for transfers of Chinook PSC allowances may reduce the reporting burden on IPAs, but create an incentive for pollock quota transfers that would increase the cooperative reporting burden. Since the participating vessels are expected to be members of both IPAs and cooperatives, the burden will ultimately be borne by the same persons. It should also be noted that IPA managers are required to submit an IPA report detailing the incentives for Chinook PSC avoidance created by the IPA. Given this requirement, it is possible that transfers may be reported, regardless of a specific requirement in this action. In that case, this IPA reporting requirement would have no associated burden. Currently cooperatives do not provide a detailed account of the distribution and transfer of pollock quota by their members. A reporting burden associated with providing that detail would arise under this alternative.

While the current number of transfers of pollock among participants is not known, it is not clear that current transfers provide a good indicator of the number of transfers that will take place in the future as IPAs and Chinook PSC avoidance incentives could substantially change the number of pollock quota transfers. Assuming a separate IPA for each sector, it is possible that a single IPA report will be generated for each sector. Under a simple IPA structure with few or no transfers, only the initial distribution of Chinook PSC allowances would need to be reported. Since the IPA manager must administer these distributions, the burden associated with including the distributions in the report would be minimal (i.e., one or two hours). While each transfer arguably increases the reporting burden, it is likely that the IPA manager will also need to administer and monitor those transfers for IPA members. Consequently, the reporting burden is reduced, as the IPA manager will have undertaken some of that burden, independent of this reporting requirement, in the course of IPA oversight. Likewise, cooperative managers will distribute pollock quota and administer transfers among members, independent of any reporting requirement under this action. Despite these administrative obligations, the reporting burden under this action could be substantial, if complex exchanges of pollock quota and Chinook PSC arise out of the IPA and cooperative structures adopted by members.

Nonetheless we estimate that an IPA manager that is actively tracking transfers will be able to develop and submit a report on transfers to NMFS over the course of a 40 hour work week. Assuming there will be three IPAs (one for each sector) a total of 120 hours of time could be required for the submission of the IPA reports on transfers.

In addition, each entity involved in a compensated transfer will have to submit a report, each time such a transfer occurs. Those reports would be similar to the ledgers required under option 1. It is believed that 15 minutes will be required by each entity for the first transfer it is involved in, and 5 minutes for each subsequent transfer. Since the IPA and cooperative structures are likely to influence the propensity of members to engage in transfers and the number of those transfers that are made for monetary compensation are not known, the number of compensated transfer reports that must be completed by any participant cannot be determined. [28]

The burden associated with **reporting each move to avoid Chinook PSC** and the fuel used for that move is expected to be minor (approximately 5 minutes for each move). Although no reliable estimate can be made for the number of moves that will need to be reported, reasonable assumptions could be used to determine an upper bound on the number of moves. If each shore based CV makes 25 trips per year and, on average, a Chinook PSC avoidance related move is made every other trip, each would make 12.5 moves per year, requiring slightly more than one hour per vessel. If 90 vessels operate in the fleet, slightly less than 95 hours would be required to complete forms for submission. If we assume that CPs and mothership operations will also require 5 minutes time every move and that these vessel make one Chinook related move every two days of operations, and that they operate a total of 150 days per year, then each vessel operator will need slightly more than 6 hours to complete and submit the data. Assuming there are 15 active CPs, 3 active mothership and 25 mothership CVs then a total of 269 hours would be required. The total industry burden is estimated at 685 hours (or approximately 6 hours per vessel).[29]

2.4.7 Costs to NMFS of administering the program

The costs to the agency associated with collecting **transfer data via option 1 (the ledger option)** arise from the production and distribution of ledger forms, the processing of completed forms, data entry, and data management. Reports may be distributed to fishery participants by mail, electronically, through a web interface, or by a combination of the above. Each of these distribution methods has an ongoing cost in terms of NMFS or contracted staff. In addition, the agency could have extensive costs associated with organizing these data for use. Under an IPA or cooperative arrangement, transfers are typically administered through intermediaries (e.g., IPAs or cooperatives). A simple transaction between two parties could involve multiple intermediaries, which could complicate organization of the data for use by analysts, driving up agency costs associated with this option. The extent of these costs will depend, in part, on the IPA and cooperative structures adopted by industry. Structures that limit the number of transfers and simplify the transfer structure would reduce agency administrative costs.

[28] An additional burden will arise, if an auditing process is used to verify the accuracy of reporting. The time burden for audits will be minimized by participants who keep accurate and complete records for their transfer activity. In such a case, it is possible that audits will take little of the respondent's time (i.e., less than one-hour). If a respondent does not maintain organized, complete records, it is possible that an audit could require several hours of the respondent's time.

[29] For the mothership sector, it is likely that a mothership will make a determination to move to avoid Chinook PSC, after which each catcher vessel would report fuel usage for the move. Administration of this reporting would be complicated, since these catcher vessels do not carry observers. A separate reporting mechanism for these costs would need to be developed, which could be coordinated across the fleet associated with each mothership.

Forms may be distributed to fishery participants by mail, and/or electronically, through a web interface. Each of these distribution methods has an ongoing costs in terms of NMFS or contracted staff and equipment and materials. Processing of forms includes tasks of tracking of responses for each field or variable in the data form, and maintaining the database and summary reports concerning quality of response. Processing typically includes scheduled reminders and responses to questions concerning the forms. In past economic collections NMFS analysts have often utilized contractors to assist with the collection phase. The costs of this survey would include direct costs for NMFS staff to finalize forms. There could also potentially be additional expenses associated with having the survey data verified by a third party.

The cost of the reporting depend greatly on the number of transactions. These would likely be around $35,000 in the first year. Finalizing forms would likely require approximately 1 month of time ($10,000). NMFS would also need to pay a contractor to mail out the surveys and answer any questions that arise during survey administration. These costs will depend greatly on the number and complexity of transactions (and whether the collection includes all forms of compensation and the effort undertaken to determine values of non-monetary compensation). Development of an electronic database, which would ideally be merged with other state and federal databases related to the pollock fishery, could also be costly. These costs will also be reflective of the complexity of transactions and involvement of intermediaries (such as IPAs and cooperatives). Reconstructing data in a manner that clearly defines such multiparty transactions could add substantially to the costs of these data. Although experience administering the collection may reduce costs after the first year, the number and complexity of transactions are likely to be determinants of administration costs. Should data validation be pursued, given the number of submitters in this fishery, it is likely that the data could be verified for a statistically representative sample of respondents. Assuming approximately 30 companies had their submissions validated, the cost of the validation by a certified public accountant would be approximately $40,000 per year.

Depending on the complexity of transactions, the number of compensated transactions that must be reported, agency costs could be substantially less, if **IPA and cooperative reports are used to collect transfer data, with individual reporting on compensated transfers (under option 2)**. Under this option, the agency costs of processing transfer ledgers would be reduced, as IPAs and cooperatives would provide summary reports of member transfer activity. Distribution costs will be the same, but processing costs could be reduced, if only transactions with monetary compensation must be reported and few of qualified transactions occur. Data entry costs are likely to be required for transactions reported in both IPA and cooperative reports and the compensated transfer reports; yet, these costs may be substantially less than those associated with organizing transfer ledgers, particularly, if a substantial number of transactions include intermediaries.

The annual costs associated with the **inseason movement surveys** will arise from the production and distribution of revised logbook forms, the processing of completed forms, data entry, and data management. As with the transfer data, there are likely to be costs associated with organizing workshops and training for the vessel operators. The cost to NMFS of adding a field to the logbook would be relatively minor. Additional printing costs may be incurred to accommodate timing of the change. The cost to have Federal observers begin entering this logbook data into their database is significantly greater. The cost of modifying the software used by federal observers and the database in which this data ultimately resides depends upon the year in which the modification is requested. At present, the software and database are updated every two (even) years (e.g., 2010, 2012, 2014). If the goal is to implement this data collection in 2011, an unexpected programmatic change would be required which would generate considerable marginal costs, approximately $22,000 – $25,000 which includes modifying the software, traveling to and installing the modified software onboard vessels, and incorporating the changes in the NMFS database and the applications staff use to manage the data. Should the data collection be

implemented in 2012, we estimate the cost of this change to be a small marginal cost to an already planned change cycle. In addition to the one-time implementation costs, we there will be additional work required of observers, but we do not anticipate this work increasing the cost to the NMFS. To the extent that electronic logbooks become available and are used by industry, the data collection costs would be the marginal costs of modifying the e-logbook. In cases where an e-log is used, there are no Observer Program costs as the data would be available to NMFS directly through the e-logbook itself.

It is important to note that observers are not stationed on catcher-vessels delivering unsorted cod-ends to motherships. Thus, there is no mechanism for the observers to gain access to the catcher vessel logbooks as they are currently submitted to NMFS directly from the vessel owner/operator in a paper format. NMFS could modify the mothership logbook and require the motherships to obtain this information from their catcher-vessels. In this case, the costs would be as noted above. Alternatively, NMFS could extract the information from the logbooks which are submitted in a paper format, quality control these data, and develop a database for long term storage of them. Based on past efforts to extract information from paper logbooks, NMFS estimates this would cost $10,000 in the start-up year for development of databases, and $30,000 annually for three months of a NMFS FTE to manage these data.

There will also be additional staff time required to construct reports summarizing vessel relocation efforts and expenses. An annual report would require approximately one month of time from a NMFS FTE ($10,000).

Under all of the collections in this alternative, processing of forms includes tracking responses for each field or variable in the data form, maintaining the database, and producing summary reports concerning quality of response. Processing typically includes scheduled reminders and responses to questions concerning the forms. In past economic collections NMFS analysts have often utilized contractors to assist with the collection phase. Data entry and data management could require trained staff to enter any hand written responses. The data would be maintained on a secure database, and though the costs of maintain secure data of this type may be captured in the ongoing data management costs of the agency, a description and communication of the security used for this information to the public and possibly the Office of Management and Budget, will involve additional agency cost. Data requests would also use agency resources.

In addition to the agency costs discussed here, the Council should consider whether any of these data should be subject to **audits** to assess their accuracy. Audits are applied to economic data collected from both crab fisheries and Amendment 80 fisheries. Chinook PSC allowances and pollock quota transfers could be audited by examining company records, an estimate of the agency time needed for these audits is provided above. The inseason vessel movement questions proposed in this alternative are subjective assessments of the skipper concerning different aspect of the fishery and decisions. An audit of these data is unlikely provide any quality improvement, so should likely be dismissed. In some instances an audit (or follow up process), could provide additional insights into fishery operations.

Unless the Council articulates a level of conservation and management importance for the various components of new recordkeeping and reporting requirements under each of the alternatives which would support an alternative approach, NMFS would enforce compliance of these requirements as it would many of the other general recordkeeping and reporting requirements implemented to date. This means that a person could continue to fish while an enforcement action was being pursued. If logbook data, annual transfer reports, or annual surveys are misreported, or not completed or submitted on time, such noncompliance of regulations could result in an enforcement action. Unlike the crab EDR program, the alternatives for this action do not include compliance provisions that would tie submission of a new report or survey to an annual issuance of a harvesting privilege (e.g., IFQ permit) or some other annual permitting process. Such provisions may require additional assessment and analysis of options.

2.4.8 Summary and Conclusions

The data collection proposed under this alternative provides insight into the rationale for inseason movements to avoid salmon bycatch. This information will facilitate comparisons of individual vessel bycatch rates prior to and following changes in fishing locations. Using currently existing data sources, the reason for a move may only be inferred by analysts, and the accuracy of those inferences might be questionable. While these data could provide useful information for assessing motivations for moves, analysts will need to use care interpreting data, as a decision to move is subjective. Despite the potential for misleading information, the potential to gain insights into vessel operator decision making could prove useful for assessing salmon avoidance behaviors. These data could also prove useful for assessing the extent to which vessel operators are willing to incur immediate costs to move from areas of high salmon bycatch. However, it is important to note that while these cost data may provide insights into the effectiveness of incentives to avoid bycatch, these data cannot be verified.

When used together with IPA reporting, data collected on salmon and pollock transfers (under either option) may augment our understanding of incentives and changes in vessel behavior at times of high and low Chinook salmon encounter rates. If sufficient numbers of vessels are not participating in IPAs, data on transfers and vessel movements could also enhance our understanding of the behaviors within and outside of IPAs. If a substantial number of transactions are compensated, analysts may be able to gain insight into salmon avoidance costs through those price data.

2.5 Alternative 3

Alternative 3 supplements status quo data and transaction data collected under Alternative 2B, with the collection of additional fuel usage and expenditure data and a skipper reporting requirement.

2.5.1 Description of the alternative

In addition to the status quo data sources, the following data will be collected:

1) Transaction data for salmon and pollock– quantity and price of transfers (survey will be used to determine whether these are arm's length transactions). (as defined under Alternative 2)
2) Average annual hourly fuel burned fishing and transiting and annual fuel purchases in cost and gallons to be used to:
   estimate costs of moving vessels to avoid salmon bycatch (vessel fuel use, transit time, and lost fishing time).
3) Post-season surveys of skippers to determine rationale for decision making during the pollock season (fishing location choices and salmon bycatch reduction measures).

2.5.2 Description of data collection

Under this alternative, data concerning **fuel and salmon avoidance gear costs** would be collected. The following two annual reporting requirements would be established:

(1) Estimated hourly fuel consumption and annual fuel consumption and costs.
(2) Descriptions and costs of gear and equipment purchases and modifications to reduce salmon bycatch (including whether the expense is exclusively for salmon bycatch avoidance).

The draft components of the survey instrument that will be used to collect these data are shown below. Further collaboration with industry to fully specify the data elements and necessary instructions and ensure data quality standards are met will be necessary before a final annual report form could be implemented.

DRAFT SAMPLE SURVEY INSTRUMENT FOR THIS ALTERNATIVE

Vessel Fuel Consumption: In Table 1.a, below, report the average fuel consumption of the vessel in gallons per hour under normal operating conditions in each category of vessel activity.

Table 1.a: Vessel Fuel Consumption

Activity	Average Gallons of Fuel per Hour
Fishing	gal/hr
Transiting (not fishing)	gal/hr

Annual Fuel Purchases and Cost: In Table 1.b, below, report the total fuel purchased, in gallons, and total fuel expenditures for this vessel during the calendar year. Indicate if fuel costs included lubrication and fluids costs.

Table 1.b: Fuel Purchase and Costs, by Season

Gallons of Fuel Purchased	Total Fuel Cost
gallons	$ Includes lubrication/fluids costs? ☐Yes ☐No

Gear/Equipment Purchases or Modifications for Salmon Bycatch Avoidance: In Table 1.c below, report any gear or equipment purchases, or modifications to existing gear and equipment made for the purpose of reducing Chinook salmon bycatch. Briefly describe the equipment purchase or modification and report the total cost. Report costs of installation or maintenance services separately if they are not included in the equipment purchase invoice. Indicate whether the expenditure was exclusively for Chinook salmon bycatch avoidance and not made for additional purposes including avoidance of other species bycatch. Report only those expenditures that were invoiced during the calendar year.

Table C: Gear/Equipment Purchases or Modifications for Salmon Bycatch Avoidance

Description	Total Cost	Chinook bycatch only
		☐Yes ☐No
		☐Yes ☐No

The **skipper survey** element of this alternative would pose a series of questions to elicit vessel operator input on important factors that impacted the vessel's performance during the year. The draft list of questions below was developed through consultation with members of the industry at workshops and through discussions with analysts and could be refined further with additional consultation.

DRAFT Annual Post-Season Vessel Operator Survey

Please answer the following questions, noting any differences between the A and B Seasons where applicable.

Did your Incentive Plan Agreement (IPA) affect your pollock fishing? ☐Yes ☐No
If yes, please describe.

Did the amount and cost of salmon bycatch allocation available to the vessel lead you to make changes in pollock fishing operations? ☐Yes ☐No
If yes, please describe.

How would you compare the salmon bycatch conditions during the A and B seasons this year relative to the last two years? Please describe any unique aspects of the season.

Did you cease pollock fishing for some period during the past A and/or B season because of Chinook salmon bycatch conditions? ☐Yes ☐No
If yes, please describe when (if known) and for how long.

Did you ever end a trip and return to port early because of salmon bycatch conditions? Please indicate the number of trips that this occurred in each season.

Number of trips suspended due to bycatch	A season	B season
0		
1-3		
4-10		
More than 10		

Other than Rolling Hotspot Closures, what new/special area closure(s) or restrictions were imposed this season that affected where you fished for pollock? Please describe the restrictions and how you readjusted your fishing in response. (An example of such a closure would be the squid closure imposed with high squid bycatch.)

Compared to a typical year, did weather have more, less, or about the same impact on fishing as usual? Please describe, especially if there were particularly uncommon conditions at any point this year.

Were there special conditions other than weather that affected your vessel's fishing operations this year (for example, extra maintenance, exceptional personnel or health conditions, special contracts in other fisheries, etc.)? Please describe.

Other than your cooperative's Incentive Plan Agreement, do you have any agreements or contracts with processors, vessel owners, or other parties that provides financial incentives to you to reduce Chinook salmon bycatch? ☐Yes ☐No

If yes, please describe.

Did actual or potential bycatch of species other than Chinook salmon cause you to change your harvesting decisions during the pollock season? ☐Yes ☐No

2.5.3 Evaluation of quality of data to be collected

The **fuel and gear cost** information collected under this reporting requirement would include average fuel use in different modes of operation, annual fuel usage, and gear and equipment purchases to avoid salmon bycatch. Industry participants familiar with vessel operations have expressed that they are able to provide an average rate of fuel consumption (i.e., gallons/hour) when fishing and transiting with a significant degree of accuracy. These data may not be useful for more than general reporting on annual fuel consumption patterns. Many vessels have flow meters indicating the instantaneous rate of fuel use; however, industry participants have stressed that the cost for a particular vessel to travel a given distance can vary dramatically with weather conditions and currents, and the gallons of fuel burned per hour may vary greatly. It may be suggested that an analyst, using VMS and observer data, can examine the time spent on the grounds and estimate the amount of fuel used by each vessel over the course of the year. This estimate could be compared with annual fuel use reported for the vessel. If the estimate is a close approximation of annual fuel usage, it could suggest that average fuel consumption rates are relatively accurate. On the other hand, such estimates may be inaccurate and could lead to unreasonable reliance on these data, particularly if vessel owners estimate average fuel usage based on hours of operation and total fuel usage. In this case, the exercise could be a simple verification of the vessel owner's calculations. Some vessel owners have attempted to use flow meter outputs and average fuel usage to estimate overall fuel use. These owners have stated that estimates are typically poor approximations of actual fuel consumption on the vessels.[30] In addition, with some vessels fishing species other than pollock (including some bottom fish fisheries), it is likely that fuel burn rates will vary across those different fisheries. As a result, pollock fishing fuel usage could be further distorted from reported values. Without discerning these different fishery activities reliability of these data may be questionable.

Unit costs of fuel for each vessel are proposed to be measured at the annual level by reporting the total annual fuel purchased for the vessel (in gallons) and the total fuel purchase cost. These data are intended to permit calculation of an annual average price per gallon by vessel, which may vary with the location of purchase and the fuel contract of the vessel owner. While it is not the intention to collect cost information for fisheries beyond the pollock fishery, discussions with industry indicated that it would be infeasible to differentiate fuel purchases by fishery. Therefore, total annual purchases and costs are expected to be the only practicable means of collecting vessel specific fuel cost information. While collection of annual price data may provide some reference for the different costs experienced by different vessels over the course of a year, those data are not likely to be usable for estimating fuel costs at any specific time in a season (and may not accurately contrast prices across vessels at particular times). Fuel prices are known to fluctuate greatly throughout the year. In addition, the benefits of a given fuel contract may vary across time, with changes in base prices. For example, it is possible that one vessel's average fuel price may be better than that of another vessel, while for a portion of the pollock season the first vessel paid a higher fuel price. Consequently, the averaging of price information may not be accurate for discerning cost differences at any point in the season.[31]

This collection of information would also include gear and equipment purchases to show industry effort and costs to reduce salmon bycatch. Descriptions of any purchases and costs would be collected, along

[30] An additional consideration to note is that even if the information requested in the fuel cost survey is collected or tracked by industry, data quality problems can arise when the specific form of the information requested in the survey is misunderstood by respondents or differs somewhat from the way in which they keep their records. With few data elements to be collected under this item, it is believed that any such difficulties can be overcome in the first few years of the collection program.

[31] Some industry members suggested that average prices of fuel in Dutch Harbor would be adequate to estimate unit fuel costs. While these amounts may be accurate for obtaining a general understanding of fuel costs, they may prove inadequate for understanding the effects of different fuel prices on fishing decisions.

with a statement of whether the purchase was made exclusively for salmon bycatch reduction purposes. No data quality issues are apparent.

The **skipper survey** would pose a series of questions to elicit vessel operator input on important factors that impacted the vessel's performance during the year. The draft questions would be refined further with additional industry consultation and finalized once pre-testing has occurred to ensure the questions are as clear as possible.

While members of the fleet have been willing to provide qualitative information on the factors that influence their fishing decisions through informal discussion, more formal and comprehensive collection of information has some potential to improve the quality of information by including portions of the fleet that might otherwise be excluded from less formal data collection efforts. Obtaining information from some of these participants could help analysts develop insights into fishing behavior important to salmon bycatch avoidance that might otherwise be overlooked. Written responses to open ended questions might be incomplete or misleading. In addition, most questions are subjective making it difficult to assess their accuracy. Careful and qualified use of these data can overcome these shortcomings. In addition, the development of worksheets or other materials that could assist industry members in recording in season impressions could be used to ensure that recollections are preserved for inclusion in the post season survey.

2.5.4 Analytical uses of the data

Data collected under this alternative is intended to provide analysts with a better ability to examine certain costs associated with Chinook PSC avoidance (including prices of allowances and pollock quota, travel costs, and gear costs).

Fuel is believed to be the greatest variable cost that operators will incur in efforts to avoid Chinook PSC. Vessels attempting to avoid Chinook PSC are believe to travel greater distances from port and spend more time and effort searching for pollock schools that can be fished with low Chinook encounters. Data on fuel costs are intended to improve the ability of analysts to understand the costs of movement that are likely to affect responses to the incentives created by Chinook PSC limits (including the performance standard) and any IPAs. Vessel-specific average rates of fuel consumption can be combined with existing VMS and observer data to allow the estimation of the differences in travel costs to different fishing locations. Using existing data sources, differences in fishing behavior of high and low Chinook PSC vessels can be examined. Incorporating fuel costs into these analyses is intended to improve the understanding of the effects of Chinook PSC measures and IPA incentives on the choices that drive those differences.

The fuel use data proposed for collection under this alternative are intended to provide an understanding of fuel costs incurred under the salmon bycatch reduction measures, and to estimate the costs of fishing location choices; however, characteristics of these data may require careful use and qualification of results. Industry members have suggested that application of average fuel use to specific activity is unlikely to provide accurate estimates of actual fuel use for any specific short time period. Fuel use on an hourly basis varies with changes in conditions. For example, a vessel towing against a strong current in high seas is very likely to burn substantially greater amounts of fuel than a vessel fishing in calm conditions. Applying the same hourly rates to these two different conditions is unlikely to accurately estimate operating costs. Likewise, general operational choices (such as running faster to avoid product quality deterioration) will affect fuel use.[32] In short, fuel costs are known to vary substantially from the

[32] For example, to maintain product quality, a vessel operator may limit the time between its first catch and making a delivery. This requisite may lead an operator to transit at a higher speed, burning more fuel. While some effort can be made to account for these influences, such as incorporating available weather data into a model, data precise

average, so applying averages to specific activity is likely to distort results. Fuel pricing also raises several questions concerning costs. This alternative proposes to collect average fuel prices for each vessel. Large fluctuations in fuel costs in recent years mean these cross company comparisons may not provide meaningful distinctions. Although these data are likely to provide some information concerning price variability among vessels, the degree to which annual average prices vary from seasonal prices will be unknown. To the extent that these data are intended to better capture operating costs differences across vessels at any specific time, they may prove unreliable.

Fuel usage and cost data collected under this alternative should provide some broad scale information concerning the changes in fuel costs arising in the fishery. Although annual usage and costs will include data from other fisheries, these data may provide some information concerning overall changes in operating costs for vessels in the pollock fishery. Using these data with VMS data could provide a better understanding of the costs of the redistribution of effort that may arise from vessels' efforts to avoid salmon bycatch.

Despite these shortcomings, fuel use and cost data proposed to be collected under this alternative should provide analysts with an improved ability to understand and assess costs associated with changes in fishing operations that may be driven by IPAs and limits on Chinook PSC. When used in conjunction with pollock quota and Chinook PSC allowance data, this fuel data may provide improved insight into the effectiveness of IPAs and PSC limits on Chinook avoidance efforts in the fishery.

The **skipper survey** contained in this data collection alternative attempts to capture qualitative information concerning several factors that may or may not appear in any proposed or collected quantitative information from the fishery. The information collected in the survey may be beneficial for understanding vessel operator decision making and responses to conditions, and may also provide information concerning variation in those decisions with vessel characteristics, technology, and production goals. This information, can serve several purposes.

Analysts will use the data to examine decision making on vessels and the effects of Chinook PSC measures, including IPAs, on decision making. Although these data are subjective, they will should provide some insights into responses to the incentives in an IPA, and variations in those responses over time, and across circumstances, including variations with vessel size, number of Chinook encounters, pollock TAC, and season. These insights could, in turn, have several benefits. First, they could lead to revisions in IPAs. If certain incentives are found to be either more or less effective than expected, the IPAs could be modified to alter incentives. If an IPA is found to induce undesirable responses, it may be modified to address those responses. If certain aspects of an IPA achieve particularly beneficial responses, those aspects may be enhanced. Within the fishery, it is possible that participants may gain some insights into methods of improving Chinook PSC avoidance. Managers may learn which aspects of the Chinook PSC measures affect on grounds decision making and the nature and timing of those affects. In making these assessments, data users will need to consider the subjective nature of the survey. Notwithstanding, these data should provide insights into decision making that could benefit fishery participants and managers alike.

The collection of gear and equipment purchase data under this alternative is intended to provide information concerning the cost of technology changes that may be adopted to avoid salmon. To the extent that these purchases are motivated by salmon bycatch measures, these data will provide useful information concerning the willingness of participants to incur added costs to avoid salmon bycatch. While these data may provide information concerning capital expenses, the broader effect of these

enough to accurately account for these influences are not likely unavailable, as only general weather information is available, while conditions are quite variable across the fishing grounds.

technology changes may not be fully understood unless data are collected to show the extent of use and any effect of use on operating costs. **If the Council is interested in pursuing information concerning changes in gear and equipment to avoid salmon bycatch, a broader collection of data concerning use of those gear and equipment and their effectiveness could be adopted as a part of a later action.**

2.5.5 Other uses of the data

The data proposed to be collected under this alternative could have several applications in analysis of the pollock fishery. In each of these cases, the use of the data will be compromised to the extent that the data contain error or provides a poor representation of the factor of interest.

Lease price data for pollock and any salmon transaction information could be used to examine changes in profitability to the extent those data reveal market prices. Fuel usage and cost data provide information concerning annual and average hourly fuel usage and costs. Although likely too general to provide information concerning any specific vessel operation, the data may be useful for assessing changes in general costs from year to year, including the effects of fuel price changes and large scale changes that arise with changes in the redistribution of fish and fishing, including changes that arise from area closures. For example, many participants have reported that fish are moving north, particularly in the B season. Changes in fuel usage and costs arising from this movement of the fishery should be reflected in annual fuel usage.

2.5.6 Costs to industry

The costs to the industry of providing **transaction data concerning salmon and pollock** data are described under Alternative 2.

The costs to industry of providing estimated **annual fuel costs and average fuel usage and costs** for different aspects of operation are relatively small, if owner estimates of these different factors are acceptable. In most cases, vessel owners monitor their fuel usage in season and maintain records concerning fuel expenditures and usage allowing low burden reporting. Depending on the degree of accuracy sought by any data collection, estimates of average usage and costs transiting and fishing may require some additional effort on the part of some vessel owners. Currently, these estimates are believed to be rough approximations of average usage and cost. Additional research into accurate measurement of fuel usage will likely be required for improvements in data quality. Estimates of the costs to industry would then be modified in response to any change in the level of burden.

Periodic monitoring of fuel usage throughout the season will likely be required to assess fuel usage in different modes of operation (e.g., fishing or transiting). If a vessel operator monitors use periodically throughout the season, it is believed that approximately 5 hours would be used to gather and submit average fuel use rate estimates. An additional hour would likely be required to gather and submit annual fuel use and costs information requested under this alternative.

The cost to industry of reporting expenses of **gear and equipment purchases or modifications** intended to improve salmon bycatch avoidance is also believed to be quite small. These expenditures are relatively simple to record and report and can easily be monitored by industry members at the time of the expenditure for year end reporting. In the event that the Council believes additional data concerning use of gear and equipment and its effects on salmon bycatch avoidance, a greater burden would arise. The extent of the increased burden would depend on the nature and scope of that additional data collection.

The **skipper survey** would be conducted at the end of the year and supplement information collected through this action and VMS and observer data regarding fishing decisions. To fully respond to the survey it is likely that many skippers may compile notes in season to be used to respond to the specific survey at year end. The burden associated with tracking activity will vary depending on the circumstances

encountered during the year. Fully completing the form is likely to require approximately 10 hours of inseason time, recording impressions of conditions and decision making. Completion of the form and submission could require as much as 5 additional hours at the end of the season.

2.5.7 Administration of the program and its costs

Costs of administration for **transaction data for salmon and pollock** are as reflected under Alternative 2 above.

Fuel usage and cost reports would be required annually under this alternative. To reduce costs associated with this reporting to the extent feasible, this requirement would be consolidated with other annual reports, including reporting of **gear and equipment purchases and modifications**. The costs to the agency arise from the production and distribution of annual reporting forms, the processing of completed forms, data entry, data management and producing summary reports concerning quality of responses. In addition, workshops and training for the submitters are likely to be necessary for this collection due to the variation in recordkeeping from one operation to the next. Reports may be distributed to fishery participants by mail, and/or electronically, through a web interface. Each of these distribution methods has an ongoing costs in terms of NMFS or contracted staff and equipment and materials. Processing of forms includes tasks of tracking of responses for each field or variable in the data form, and maintaining the database and summary reports concerning quality of response. Processing typically includes scheduled reminders and responses to questions concerning the forms. In past economic collections NMFS analysts have often utilized contractors to assist with the collection phase.

The costs of this survey would include direct costs for NMFS staff to develop and implement an annual fuel consumption and fuel cost survey which would also record any expenditures for gear or equipment explicitly undertaken to reduce Chinook PSC. There could also potentially be additional expenses associated with having the survey data verified by a third party.

The cost of the survey would likely be around $35,000 in the first year. One month of time for a NMFS FTE would be required to pre-test and to finalize the existing survey ($10,000). NMFS would also need to pay a contractor to mail out the surveys and answer any questions that arise during survey administration ($15,000). Finally, the contractor would need to enter the information into an electronic database, which would ideally be merged with other state and federal databases related to the pollock fishery ($10,000). After the first year of the program the annual cost of administering the survey and entering the data would be approximately $25,000.

Should data validation be pursued, given the number of submitters in this fishery, it is likely that the data could be verified for a statistically representative sample of respondents. Assuming approximately 30 companies had their submissions validated, the cost of the validation by a certified public accountant would be approximately $20,000 per year.

NMFS does not anticipate extensive administrative costs for implementing physical changes to paper logbooks or changes to the electronic logbook from additional data on fuel used in a haul or Chinook salmon caught in a haul, under Alternative 2A and 2B. These new fields would be added to the catcher vessel trawl daily fishing logbook and to the catcher/processor trawl daily cumulative production logbook. Regarding the catcher vessel daily fishing logbooks and catcher processor daily cumulative production logbooks, some additional cost could be incurred for print setting of changes suggested for the fuel and Chinook catch fields, but the costs for these changes would be small (less than $1,000). The fuel and catch fields will also be added to the electronic logbook for trawl catcher/processors introduced in Amendment 91. The electronic logbook works as an extension to eLandings for trawl catcher/processor entities affected under Amendment 91. The addition of the electronic logbook to eLandings will require

changes to the software to add not only the additional fields for fuel and Chinook catch data but also all of the fields currently found in the catcher/processor daily cumulative production logbook.

Data entry and data management could require trained staff to enter any hand written responses. The data would be maintained on a secure database, and though the costs of maintain secure data of this type may be captured in the ongoing data management costs of the agency, a description and communication of the security used for this information to the public and possibly the Office of Management and Budget, will involve additional agency cost. Data requests would also use agency resources.

As with other annual reports, the annual costs associated with the **skipper survey** will arise from the production and distribution of reporting forms, the processing of completed forms, data entry, and data management. While the use of written open ended questions in the survey may increase the quality of information received in the survey, it also could increase the administrative costs associated with the survey. Electronic submission could be used to control data entry costs, but the administrative burden associated with managing written survey responses may be expected to be substantial.

A few factors will contribute to NMFS cost for the skipper survey. Some pre-testing and refinement by NMFS staff will be necessary to fully define a satisfactory set of questions to ask the skippers. The expected cost of these activities should not exceed $15,000 in staff time. The use of a written survey will require NMFS to print and mail a number of four-to-six page pamphlets (there will be less than one page of questions, but the instrument must provide instructions and allow space for the skipper to respond). We anticipate mailing approximately 150 of these surveys to the skipper population. With mailing costs and the inclusion of a self-addressed, stamped envelope for return mailing, the total costs of the written survey would not exceed $350. A web-page could also be developed to facilitate the survey, and the cost of developing such a survey should not exceed $5,000.

2.5.8 Conclusions

The data collection proposed under this alternative is largely intended to provide improve insight into the costs of Chinook PSC avoidance and factors affecting Chinook avoidance efforts. Fuel usage and costs may provide general insight into travel costs associated with choices of fishing locations and movements to avoid Chinook PSC. While Chinook avoidance gear and equipment costs information will provide some indication of industry's willingness to incur costs for Chinook avoidance, without additional collection of data concerning the use of the gear, those data may not accurately reflect the industry's costs or willingness to use modified gear to avoid Chinook PSC. The skipper surveys should provide analysts with improved understanding of the factors that affect fishing decisions, particularly those likely to affect Chinook PSC rates. Data from these surveys should improve analysts understanding of the effectiveness of IPAs and other measures intended to contribute to Chinook PSC avoidance.

2.5.9 Confidentiality

Protecting the confidentiality of any economic data collected to under this action is a high priority for the management agency and the industry. Since the data would be collected under the authority of the MSA, the substantial protections provided by the Act will be maintained for all data. To prevent disclosure of confidential information, it is imperative that regulations preclude the data from being used, either by individuals that are not intended to have access to the data, or for purposes for which the data are not intended. Authorized agency staff members from NMFS, ADF&G, and Council are currently defined as the potential users of such data. Other users could include individuals that are contractors of the above agencies that are conducting research associated with the program and its fisheries. University faculty conducting research for one of the above agencies would also be envisioned as users that would be given

access to these data.[33] The release of these data outside of the primary users or for other purposes would be strictly regulated. NMFS has stated that protecting the confidentiality of the data will be one of its highest priorities. At a minimum, all persons with access to the data are sworn, under penalty of law, to protect the confidentiality and use of the data.

3.0 INITIAL REGULATORY FLEXIBILITY ACT (IRFA)

3.1 The Purpose of an IRFA

The Regulatory Flexibility Act (RFA), first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action.

On March 29, 1996, President Clinton signed the Small Business Regulatory Enforcement Fairness Act. Among other things, the new law amended the RFA to allow judicial review of an agency's compliance with the RFA. The 1996 amendments also updated the requirements for a final regulatory flexibility analysis, including a description of the steps an agency must take to minimize the significant economic impact on small entities. Finally, the 1996 amendments expanded the authority of the Chief Counsel for Advocacy of the Small Business Administration (SBA) to file *amicus* briefs in court proceedings involving an agency's violation of the RFA.

In determining the scope, or 'universe', of the entities to be considered in an IRFA, NMFS generally includes only those entities that can reasonably be expected to be directly regulated by the proposed action. If the effects of the rule fall primarily on a distinct segment, or portion thereof, of the industry (e.g., user group, gear type, geographic area), that segment would be considered the universe for the purpose of this analysis. NMFS interprets the intent of the RFA to address negative economic impacts, not beneficial impacts, and thus such a focus exists in analyses that are designed to address RFA compliance.

3.2 What is required in an IRFA?

Under 5 U.S.C., Section 603(b) of the RFA, each IRFA is required to contain:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the objectives of, and the legal basis for, the proposed rule;
- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
- A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;

[33] In addition, agencies such as AKFIN or PSMFC may be contracted to maintain and supply data to agencies users and would be authorized to have access to the data for that purpose. Access to the data by these agencies would also be subject to confidentiality restrictions applicable to all other agency staff.

- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;
- A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:

    1. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
    2. The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
    3. The use of performance rather than design standards;
    4. An exemption from coverage of the rule, or any part thereof, for such small entities.

3.3 What is a small entity?

The RFA recognizes and defines three kinds of small entities: (1) small businesses, (2) small non-profit organizations, and (3) small government jurisdictions.

Small business. Section 601(3) of the RFA defines a 'small business' as having the same meaning as 'small business concern', which is defined under Section 3 of the Small Business Act. 'Small business' or 'small business concern' includes any firm that is independently owned and operated and not dominant in its field of operation. The SBA has further defined a "small business concern" as one "organized for profit, with a place of business located in the United States, and which operates primarily within the United States or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor… A small business concern may be in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the firm is a joint venture there can be no more than 49 percent participation by foreign business entities in the joint venture."

The SBA has established size criteria for all major industry sectors in the United States, including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual receipts not in excess of $4.0 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $4.0 million criterion for fish harvesting operations. Finally, a wholesale business servicing the fishing industry is a small business if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide.

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are

organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when, (1) a person is an affiliate of a concern if the person owns or controls, or has the power to control 50 percent or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock, or (2) if two or more persons each owns, controls or has the power to control less than 50 percent of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors, or general partners, controls the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as joint ventures if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

Small organizations. The RFA defines "small organizations" as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

Small governmental jurisdictions. The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of fewer than 50,000.

3.4 Reason for considering the action

The Council adopted the following purpose statement for this action:

> In April 2009 the Council approved Amendment 91 to the BSAI groundfish fishery FMP to reduce Chinook salmon bycatch in the Bering Sea pollock fleet. Under Amendment 91, the pollock fishery has the option of participating in a NMFS-approved Incentive Plan Agreement (IPA) to access a higher hard cap than is available in the absence of an IPA. The IPAs provide a new and innovative method of bycatch management. A data collection program is needed in conjunction with Amendment 91 to understand the effects and impact of the IPAs. The data collection program will focus on: (1) evaluating the effectiveness of the IPA incentives in times of high and low levels of salmon bycatch abundance, the hard cap, and the performance standard in terms of reducing salmon bycatch, and (2) evaluating how the Council's action affects where, when, and how pollock fishing and salmon bycatch occur. The data collection program will also provide data for the agency to study and verify conclusions drawn by industry in the IPA annual reports. To ensure that a full assessment of the program is possible, the data collection program should be implemented at the time Amendment 91 is implemented or as soon as practicable.
>
> To ensure that a full assessment of the program is possible from the start of the program, the data collection program should be separated into two phases, with a suite of data collection measures implemented at the time Amendment 91 goes into effect and sent to the Comprehensive Economic Data Collection Committee after IPAs have been fully developed and submitted to NMFS.

3.5 Objectives of, and legal basis for, the proposed action

Under the Magnuson-Stevens Act, the United States has exclusive management authority over all living marine resources found within its EEZ. The management of marine fishery resources is vested in the Secretary of Commerce, with advice from the Regional Fishery Management Councils. The Bering Sea pollock fishery in the EEZ off Alaska is managed under the BSAI FMP.

Statutory authority for measures designed to reduce bycatch is specifically addressed in Sec. 600.350 of the Magnuson-Stevens Act. That section establishes National Standard 9—Bycatch, which directs the Councils to minimize bycatch and to minimize mortality of bycatch when it cannot be avoided.

The objective of the proposed action is to better measure the effectiveness of the BS Chinook salmon bycatch program at reducing Chinook at all levels of abundance in the BS Pollock fishery, and further, to comply with National Standard 1 of the Magnuson-Stevens Act which requires that conservation and management measures prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

3.6 Number and description of small entities regulated by the proposed action

The proposed action applies only to those entities that participate in the directed pollock trawl fishery in the BS. These entities include the American Fisheries Act (AFA) affiliated pollock fleet and the six western Alaska Community Development Quota (CDQ) organizations that presently receive CDQ allocations of BS pollock.

The RFA requires a consideration of affiliations between entities for the purpose of assessing if an entity is small. The AFA pollock cooperatives in the BS are an important type of affiliation. All of the AFA pollock cooperatives directly affected by the proposed action are considered to be large entities for RFA purposes, as each is a harvesting enterprise with in excess of $4.0 million in gross revenues.

The six CDQ organizations, which are also directly regulated, are considered small entities.

3.7 Recordkeeping and reporting requirements

No small entities are directly affected by the proposed recordkeeping and reporting requirements.

3.8 Federal rules that may duplicate, overlap, or conflict with proposed action

No data collections currently overlap or conflict with the data collection proposed by this action.

3.9 Description of significant alternatives to the proposed action

The Council also considered alternatives that would collect more detailed revenue and cost data (including roe production and revenue data and daily operating cost data). Collection of these data would be intended to facilitate improved study of the effectiveness of salmon bycatch measures (including IPAs) across various segments of the fleets and an improved understanding of the effects of those measures on participants in the fisheries. Specifically, these data could be used to examine revenue and cost tradeoffs of vessels in avoiding Chinook PSC.

While acknowledging that these additional data could improve the information concerning the fishery and Chinook PSC avoidance, the Council elected to remove alternatives collecting these data from consideration at this time. The removed alternatives were believed by the Council to contain too many aspects that would require additional time to fully develop and implement, which could result in a delay in analysis and implementation of this action. In its purpose and need statement, the Council expressed its intent to have collection of these additional data considered by its comprehensive data collection

committee after IPAs have been developed by industry. This later consideration could allow this data collection to be limited in focus, which might allow for earlier implementation of this action. In addition, by incorporating the more expansive data collection into a later action, the Council hopes to allow for additional development of a more considered broad data collection program.

4.0 CONSISTENCY WITH APPLICABLE LAW AND POLICY

This section examines the consistency of the alternatives with the National Standards and Fishery Impact Statement requirements in the Magnuson-Stevens Act and Executive Order 12866.

4.1 National Standards

Below are the ten National Standards as contained in the Magnuson-Stevens Act, and a brief discussion of the consistency of the proposed alternatives with each of those National Standards, as applicable.

National Standard 1
Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery.

None of the alternatives considered in this action would result in overfishing of groundfish in the BSAI or GOA. The alternatives would also not impact, on a continuing basis, the ability to achieve the optimum yield from each groundfish fishery.

National Standard 2
Conservation and management measures shall be based upon the best scientific information available.

The analysis for this amendment is based upon the best and most recent scientific information available.

National Standard 3
To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The proposed action is consistent with the management of individual stocks as a unit or interrelated stocks as a unit or in close coordination.

National Standard 4
Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various U.S. fishermen, such allocation shall be (A) fair and equitable to all such fishermen, (B) reasonably calculated to promote conservation, and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The proposed alternatives treat all vessels the same and would be implemented without discrimination among participants.

National Standard 5
Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources, except that no such measure shall have economic allocation as its sole purpose.

This action is not expected to affect the efficiency with which the BS pollock resource is utilized.

National Standard 6

Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

None of the proposed alternatives is expected to affect the availability of and variability in the groundfish resources in the BSAI and GOA in future years. The BS pollock harvest would be managed to and limited by the TACs for each species, regardless of the proposed action considered in this amendment.

National Standard 7
Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

This action does not duplicate any other management action.

National Standard 8
Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

This action is not expected to have adverse impacts on communities or affect community sustainability.

National Standard 9
Conservation and management measures shall, to the extent practicable, (A) minimize bycatch, and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

The proposed action could provide additional information to assist in the development of management measures to minimize Chinook bycatch.

National Standard 10
Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

The proposed action is not expected to have adverse impacts on safety at sea.

4.2 Section 303(a)(9) – Fisheries Impact Statement

Section 303(a)(9) of the Magnuson-Stevens Act requires that any management measure submitted by the Council take into account potential impacts on the participants in the fisheries, as well as participants in adjacent fisheries. The impacts on participants in the pot and hook-and-line Pacific cod fisheries in the BSAI have been discussed in previous sections of this document (see Section 2.0). The proposed alternatives are not anticipated to have effects on participants in other fisheries.

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APPENDIX A: BERING SEA AFA POLLOCK TRAWL FISHERY CHINOOK SALMON BYCATCH MOTION

Preferred alternative

This alternative would establish a Chinook salmon bycatch cap for each pollock fishery season which, when reached, would require all directed pollock fishing to cease for that season. Components 2-4 specify the allocation and transferability provisions associated with the cap.

Component 1: Hard cap with option for incentive plan agreements (IPA)

Annual scenario 1: Hard cap with an IPA(s) that provides explicit incentive(s) to promote Chinook salmon avoidance in all years

Hard cap if an IPA(s) is in place that provides explicit incentive(s) for each participant to avoid Chinook salmon bycatch in all years:

Overall Chinook salmon cap: 60,000, allocated by season and under Components 2-4 as described below.

For those vessels or CDQ groups that opt out of such a NMFS approved incentive plan agreement, the maximum hard cap (backstop cap) will be established as follows:

An amount no greater than the overall cap: 28,496

Option 3: To ensure the overall cap can be managed as a hard cap, subtract from the overall cap a proportion representing vessels or CDQ groups opting out of the incentive plan(s), and create a backstop cap so that the sum of the caps does not exceed the high cap.

Option C: Subtract from the overall cap the proportion of the backstop cap represented by vessels or CDQ groups opting out and fishing under the backstop cap and use this same amount to create the backstop cap.

Adjustments to the overall cap and backstop cap for vessels or CDQ groups opting out will be made after sector allocations. The amount of the adjustments will be based on the opt out vessel's percentage of AFA pollock within their sector as specified on pages 67- 70 of the DEIS or on the CDQ group's current percentage allocation of their sector allocation of the Chinook salmon cap.

IPA requirements (for NMFS approval):

- An IPA must describe incentive(s) for each vessel to avoid Chinook salmon bycatch under any condition of pollock and Chinook salmon abundance in all years.
- Incentive measures must describe rewards for Chinook salmon bycatch avoidance, penalties for failure to avoid Chinook salmon bycatch at the vessel level, or both.
- The IPA must specify how those incentives are expected to promote reductions in actual individual vessel bycatch rates relative to what would have occurred in absence of the incentive program. Incentive measures must promote Chinook salmon savings in any condition of pollock and Chinook salmon abundance, such that they are expected to influence operational decisions to avoid Chinook salmon bycatch.
- The IPA must describe how the IPA ensures each vessel will manage their bycatch to keep total bycatch below the sector level regulatory performance standard.

Annual reporting:

- The IPA(s) must be made available for Council and public review. In addition, year-end annual reports are required to be submitted to the Council by April 1 the following year to provide sufficient time for independent evaluation by the Council.

- An annual report to the Council must include:

  1) a comprehensive explanation of incentive measures in effect in the previous year,

  2) how incentive measures affected individual vessels, and

  3) Evaluation of whether incentive measures were effective in achieving salmon savings beyond levels that would have been achieved in absence of the measures.

IPA eligibility:
On an annual basis, before a date certain established by NMFS through regulation, participants in the pollock fishery may file an IPA with NMFS or join or exit an existing approved IPA. An IPA will be considered valid if 1) it meets the criteria set forth above; 2) it commits each party to be bound by the rules of the IPA; and 3) the parties to the IPA represent not less than 9% of the pollock quota and at least two non-affiliated companies using the AFA definition of affiliation.

Membership in an IPA is voluntary. No person may be required to join an IPA. Upon receipt of written notification that a person wants to join an IPA, that IPA must allow the person to join subject to the terms and agreements that apply to all members of the IPA as established in the contract governing the conduct of the IPA.

In the event that no IPA is approved by NMFS, then the pollock fishery shall be managed under annual scenario 2.

Annual scenario 2: Hard cap in absence of an approved IPA with explicit incentive(s) to promote Chinook salmon avoidance
Hard cap in absence of an approved IPA that provides explicit incentive(s) to all participants to avoid salmon bycatch in all years:

Overall Chinook salmon cap: 47,591, allocated by season and under Components 2-4 as described below

Seasonal distribution of caps
Any hard cap would be apportioned between the pollock A and B seasons. The seasonal distribution is 70/30.

Seasonal rollover of caps

Unused salmon from the A season would be made available to the recipient of the salmon bycatch hard cap in the B season within each management year at an amount equal to the recipient's unused A season bycatch cap.

Component 2: Sector allocation
Separate sector level caps will be distributed within each season for the CDQ sector and the three remaining AFA sectors, the inshore catcher vessel (CV) sector, the mothership sector, and the offshore catcher processor (CP) sector, as follows:

A season: CDQ 9.3%; inshore CV fleet 49.8%; mothership fleet 8.0%; offshore CP fleet 32.9%
B season: CDQ 5.5%; inshore CV fleet 69.3%; mothership fleet 7.3%; offshore CP fleet 17.9%

Rationale for distribution: This distribution is based on an estimate of the 5-year (2002-2006) historical average of the annual proportion of Chinook salmon bycatch by sector within each season, adjusted by blending the reported bycatch for CDQ and non-CDQ partner sectors. It is also weighted by the AFA pollock allocation for each sector. In each season, the proportional allocation by sector is made up of 0.75 multiplied by the adjusted 5-year historical average bycatch by sector and 0.25 multiplied by the AFA pollock allocation by sector.

Component 3: Sector transfers
Allocate Chinook salmon bycatch caps to each sector and allow the entity representing each non-CDQ sector and the CDQ groups to transfer Chinook salmon bycatch caps among the sectors and inshore cooperatives and CDQ groups.

Allow post-delivery (bycatch) transfer of Chinook salmon allocations. This provision would be administered consistent with the post-delivery provisions the Council adopted for the BSAI crab rationalization program, Amendment 80, and Rockfish Program, except that any recipient of a post delivery transfer during a season may not fish for the remainder of that season.

Component 4: Cooperative provisions
Each inshore cooperative and the inshore limited access fishery (if the inshore limited access fishery existed in a particular year) shall receive a Chinook salmon allocation managed at the cooperative level. If the cooperative or limited access fishery Chinook salmon cap is reached, the cooperative or limited access fishery must stop fishing for pollock.

The initial allocation of Chinook salmon by cooperative within the shore-based CV fleet or to the limited access fishery would be based upon the proportion of total sector pollock catch associated with the vessels in the cooperative or limited access fishery.

Cooperative transfers
When a Chinook salmon cooperative cap is reached, the cooperative must stop fishing for pollock. Cooperatives may transfer Chinook salmon bycatch with other sectors, inshore cooperatives, or CDQ groups.

Allow post-delivery (bycatch) transfer of Chinook salmon allocations. This provision would be administered consistent with the post-delivery provisions the Council adopted for the BSAI crab rationalization program, Amendment 80, and Rockfish Program, except that any recipient of a post delivery transfer during a season may not fish for the remainder of that season.

Component 5: Performance standard
Each sector will be annually evaluated against a performance standard. If the sector's annual Chinook salmon bycatch exceeds the sector's portion of the annual scenario 2 cap level in any 3 years within a consecutive 7-year period, all vessels within that sector will operate under annual scenario 2 in all subsequent years. Any vessel or CDQ group that fishes under the opt out backstop pool will not be evaluated or included in annual calculations of a sector's performance standard.

Component 6: Observer program
The Council includes in its preferred alternative the observer coverage and monitoring requirements recommended by NMFS for the PPA and described in section 2.5.4.3 (page 98) of the DEIS and in

sections 2.5.2.7 and 2.5.2.8 (pages 81 - 84). These recommendations increase observer coverage to 100 percent for catcher vessels regardless of vessel length. This increase in observer coverage does not apply to catcher vessels delivering unsorted codends at sea. Chinook salmon would be allowed to be discarded from catcher vessels only after being reported to and recorded by the vessel observer.

The Council also authorizes NMFS to develop modifications to regulations for the shoreside processors' catch monitoring and control plans to add performance standards to ensure accurate accounting for Chinook salmon at the plants, if NMFS determines that such modifications are needed.

Remove current regulations for Chinook salmon bycatch management

In taking final action, the Council's intent is for NMFS to remove current regulations governing Chinook salmon bycatch management in the Bering Sea and replace those regulations with the preferred alternative. Revisions to current regulations are as follows:

- Remove regulations for the current BS Chinook salmon PSC limit of 29,000 salmon that triggers closure of the Chinook salmon savings area for the BS pollock fishery.

- Remove Chinook salmon savings area definition for the BS.

- Remove exemptions to closure of the BS Chinook salmon savings areas for those cooperatives and CDQ groups participating in the current voluntary rolling hot spot (VRHS) ICA.

- Remove all elements of the current VRHS ICA regulations addressing Chinook salmon. New Chinook salmon bycatch management measures, including any incentive plan agreement requirements, would be added to the regulations. Retain regulations for the non-Chinook salmon components of the current VRHS ICA would remain.

The Council deems proposed regulations that clearly and directly flow from the provisions of this motion to be necessary and appropriate in accordance with section 303 (c) and therefore the Council authorizes the Executive Director and the Chair to review the draft proposed regulations when provided by NMFS to ensure that the proposed regulations to be submitted to the Secretary under section 303 (c) are consistent with these instructions.