Regulatory Amendment to Modify Monitoring and Enforcement Requirements in the BSAI Freezer Longline Fleet

Regulatory Impact Review/ Environmental Assessment

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Abstract: This document contains a Regulatory Impact Review and an Environmental Assessment evaluating the economic and environmental impacts of an action to enhance monitoring and enforcement measures used to verify the harvest of Pacific cod by freezer longliners that operate in the Bering Sea and Aleutian Islands (BSAI) groundfish management area, and to improve the precision of harvest estimates. The measures cover this fleet when it is operating in the Gulf of Alaska as well as in the BSAI. The analyses in this document address the requirements of Executive Order 12866 and the National Environmental Policy Act.

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Background and Purpose of this Action

This document evaluates the potential impacts associated with proposed regulatory amendments to require increased monitoring for longline catcher/processors that engage in directed fisheries for Pacific cod in the Bering Sea and Aleutian Islands (BSAI) Management Area; or participate in the Community Development Quota (CDQ) program. This action has been proposed in response to the need for enhanced monitoring and catch accounting measures as a result of the formation of a voluntary quota-type program by the participants in this fishery. The preferred alternative would require that a vessel possessing a License Limitation Program (LLP) license endorsed for longline gear, catcher/processor fishing, BSAI operations, and Pacific cod, use monitoring measures similar to those required in other catcher/processor quota programs. These measures would apply to this group of vessels when fishing in the BSAI or Gulf of Alaska (GOA) at any time when Pacific cod is open to directed fishing in the BSAI.

There are 33 catcher/processors currently possessing LLP licenses that allow directed fishing for Pacific cod in the BSAI with hook-and-line gear. Pacific cod total allowable catch (TAC) and halibut prohibited species catch (PSC) are each apportioned specifically to this subsector. Because no additional LLP licenses may be issued, and no other group of vessels may harvest this allocation, the owners of these LLP licenses have been able to form a voluntary fishing cooperative to which the owners of all of the vessels belong. This cooperative apportions the TAC and PSC among its members based on historical harvest amounts and has effectively created a quota type fishery. The National Marine Fisheries Service (NMFS) believes that quota programs require additional catch monitoring measures, designed to enhance catch accounting, and this analysis examines four alternatives for the monitoring of this fishery.

Alternatives Considered for this Action

Alternative 1. No action. Catch of Pacific cod and incidental catch of other species by freezer longliners would continue to be accounted for by extrapolation of observer data. No additional monitoring measures would be implemented.

Alternative 2. The scales alternative. Under this alternative, a freezer longliner fishing off Alaska, at any time when directed fishing for Pacific cod is open, or when participating in any groundfish CDQ fishery, would be required to:

- Weigh, on a NMFS-approved motion-compensated scale, all Pacific cod that are brought aboard the vessel;
- Apply a product recovery rate of 1.00 for fish weighed before bleeding, 0.99 for fish weighed before fish are placed in the bleeding tank, and 0.98 for fish weighed after leaving the bleeding tank;
- Provide a video monitoring system that clearly records all areas where catch sorting or weighing takes place, store the data to a removable hard drive, and save those data for 120 days;
- Provide an observer sampling station meeting the requirements of 50 CFR 679.28(d);
- Carry a lead level 2 observer;
- Modify lead qualification requirements so that 30 sampled-sets, rather than 60, are required;
- Comply with the electronic logbook requirements specified at 50 CFR679.5(f);
- Eliminate alternative fishing plan requirement.

Alternative 3. The enhanced observer coverage alternative. Under this alternative, a freezer longliner fishing off Alaska, at any time when directed fishing for Pacific cod is open or when participating in any groundfish CDQ fishery, would be required to:

- Carry two observers, at least one of whom has lead level 2 certification;
- Modify lead qualification requirements so that 30 sampled-sets, rather than 60, are required;
- Provide an observer sampling station meeting the requirements of 50 CFR 679.28(d);
- Comply with the electronic logbook requirements specified at 50 CFR679.5(f);
- Eliminate alternative fishing plan requirement.

Alternative 4. The scales or enhanced observer coverage alternative (the preferred alternative). Vessel owners would be allowed to select between the suites of measures described under Alternative 2 or Alternative 3, annually. The selection of an alternative would have to be made prior to November 1 of the year proceeding the year during which the alternative would be complied with. Once a vessel owner made an election, the vessel would be required to operate under that alternative for the entire fishing year.

Under all of the action alternatives, owners of freezer longliners that do not intend to participate in directed Pacific cod fishing in the BSAI or any groundfish CDQ fishery could choose to opt out. An opt-out election would have to be made by November 1 of the prior year. A vessel that has opted out would not be allowed to directed fish for Pacific cod in the BSAI or participate in any groundfish CDQ fishery. Vessels that opted out would be allowed to participate in directed Pacific cod fisheries in the GOA.

Potential effects of this Action

A Regulatory Impact Review (RIR) was conducted to comply with Executive Order 12866, and alternatives were evaluated with respect to the economic impact that each may have on the affected entities.

The costs of the scales alternative, Alternative 2, are described in Section 1.3.1. To comply with the scale alternative, firms will incur costs for the installation of a motion compensated flow scale, an observer sampling station with motion compensated platform scale, and video monitoring equipment. In addition, firms will incur annual inspection, repair, and maintenance costs. Firms will incur costs as observers are required to have lead level 2 qualifications. NMFS will incur annual costs for the inspection and certification of scales, video monitoring equipment, and the observer sampling station.

The range of potential initial installation costs are estimated to be between $115,300 and $458,800 for a vessel. Subsequent annual expenses ranged between $7,600 and $8,100 per vessel. With 33 vessels estimated to incur these expenses, total costs ranged between $3.8 million and $15.1 million for installation, and between $250,800 and $267,300 a year, thereafter. These costs do not reflect potential negative (or positive) impacts on vessel operating efficiency, which could not be estimated quantitatively. NMFS is estimated to incur between $117,000 and $187,000 in costs the first year of the program, and about $26,000 per year, in subsequent years.

The costs of the second observer alternative, Alternative 3, are described in Section 1.3.2. These include the costs of the installation and annual inspection of an observer sampling station and associated motion compensated platform scale, the cost of a second observer, the cost of upgrading at least one of the observers to a lead level 2 observer, and the cost of an electronic logbook.

The costs of constructing the observer sampling station are estimated to range between $0 (since some vessels already have observer sampling stations to comply with the rules governing CDQ groundfish fishing), and $30,300 (for a vessel that installs a station, purchases two platform scales - to have one for backup, and incurs initial certification and electronic logbook training costs). Inspection costs and annual maintenance and repairs for the observer station and platform scale were estimated at up to $500. The significant annual cost component for Alternative 3 is the cost of a second observer, which is estimated to

range between about $35,000 and about $78,000 per boat, depending on the number of days of groundfish fishing. An additional cost will be associated with the lead level 2 requirement.

Alternative 3 created significant costs for NMFS. Much of this, including the cost of initial inspections of the observer sampling station, and the cost of developing the electronic logbook, are common to both Alternative 2 and Alternative 3. These one-time program start-up costs are expected to range between about $38,000 and $108,000. However, in addition, Alternative 3 requires significant expenditures in support of the additional observers. These are estimated to be about $662,000 a year.

The preferred alternative would allow the vessel operator to choose the scales option or the observer option, each year. The costs of the preferred alternative, Alternative 4, are described in Section 1.3.3. These would vary depending on whether the vessel operator chooses the scales option or the additional observer option. Anecdotal information from industry representatives suggests that most operators will choose the scales option. The cost analysis in this RIR gives credence to this conclusion. Thus, it is likely that the costs for the scales alternative provide a more accurate picture of program costs under the preferred alternative.

The benefits from this action are described in Section 1.3.4. These include: (a) allowing NMFS to enforce Pacific cod catch limits in the presence of a voluntary cooperative; (b) giving freezer longline representatives greater confidence in the accuracy of NMFS Pacific cod catch estimates; and (c) improving the efficacy of the cooperative's catch share program. It was not possible to quantify these benefits.

Alternatives 2, 3, and 4 require participating vessels to carry one "fixed gear lead level 2 qualified" observer. Currently, to obtain level 2 qualification, an observer must have successfully completed NMFS-approved Level 2 observer training, have completed at least 60 days of observer data collection in the groundfish fisheries off of Alaska, and have received an evaluation by NMFS for their most recent deployment that indicated they met Observer Program expectations for that deployment. To acquire the additional "lead" qualification for non-trawl gear, the observer must have completed two observer cruises (contracts) of at least 10 days each, and sampled at least 60 sets on a vessel using non-trawl gear. In this action, NMFS proposes to reduce the number of sampled sets required from 60 to 30.

NMFS believes that the knowledge of the industry, and the self-confidence associated with these experience requirements are necessary for the collection of complete, accurate, and timely fisheries data in the quota share program, run by the freezer longline cooperative. All quota share programs adopted since 1999 have included similar experience requirements for observers (modified, depending on the gear in use). Quota share programs enhance incentives for individual vessel operations to try and manipulate catch estimates, and agency experience has shown the need for experienced observers in these situations. Other programs with lead level 2 requirements have also involved two observers on a vessel. This program offers vessels the opportunity to reduce observer costs by installing a set of scales and operating with a single observer. However, the demands on an observer, when only a single observer is present, are increased, and the need for lead level 2 experienced observers is correspondingly higher.

Lead level 2 experience requirements will increase the costs of the program to vessel operators. A letter from observer providers has indicated that it would not be possible to provide enough lead level 2 observers to allow the fleet to fully harvest its allocations. The observer providers noted that, if all freezer longliners took advantage of the scales option, there would be few, if any, opportunities to qualify new lead level 2 observers within the fleet; in addition, they indicated that it would also be difficult for observers to gain the necessary experience within the non-trawl catcher vessel fleet. Observer providers indicate that it has been difficult to find the lead level 2 observers necessary to meet the relatively modest recent requirements for CDQ freezer longline lead level 2 observers. Observer program estimates

indicate that this means that, out of 208 qualified observers at the end of 2011, the industry had had difficulty identifying and mobilizing the 39 that had been used as lead level 2 observers in 2010 and 2011. The proposed measures will increase the numbers required, depending on the number of vessels that remain in the fishery, and the number of days of fishing they do. The observer provider letter estimated a potential requirement of 200 observers a year. An alternative estimate prepared for this analysis, suggested a requirement of between 110 and 150 observers.

The reduction in the number of required sampled sets from 60 to 30 should help to partially resolve this situation. NMFS estimates that, if this measure had been in place at the end of 2011, about 250 persons would have qualified as lead level 2 observers. The observer restructuring program that is expected to be implemented at the start of 2013 will also extend the observer requirement to new classes of catcher vessels, including the vessels in the halibut fleet. This will provide new opportunities for observers seeking lead level 2 experience, but will also create new demands for observers, and for experienced observers, as well. In the past, the observer provider industry appears not to have made significant use of price mechanisms to increase the supply of observers to lead level 2 positions. NMFS expects that this will change under the pressure of this change in observer requirements. Firms that require lead level 2 observers to operate in valuable fisheries will bid up the compensation offered to observer providers, and observer providers will increase their investment in preparing lead level 2 observers, and bid up compensation to observers willing to take these positions. As the cost of observers rises for fishing firms, they may take actions to reduce observer requirements, perhaps increasing the rate of harvest above what it would otherwise have been, so as to reduce fishing time. These measures will increase the costs of operating in the cooperative to the fishing industry, and reduce its net benefits.

Potential impacts of this action on rural fishery dependent communities are uncertain, but believed to be small. This is a catcher/processor fleet, largely based in more urbanized regions. The action would have its primary impact indirectly, through its effect on the cooperative, but the ultimate impact of the cooperative itself is not clear. While it may lead to some rationalization and reduction in fleet size, it may also extend the fishing season, and lead to more vessel activity in Alaska waters, and visits to Alaskan ports.

This action is not expected to have a significant net impact on fishing vessel safety or on the potential for human injury or mortality. Alternative 3 would increase the number of observers placed on vessels and, thus, at risk in case of an incident at sea. Increased observer coverage may be associated with a reduction in average crew size, as noted. This alternative may, thus, increase the number of people facing the risks of a fishing environment and reduce effective crew size, and possibly crew efficiency. This is not the case with Alternatives 1 or 2, and, as noted, probably significantly less likely under Alternative 4.

Enforcement costs are also likely to rise under all the alternatives except the no action alternative, as enforcement personnel will be required to oversee new regulatory requirements for freezer longliners for longer periods than experienced in the past. Non-compliance with any of the regulations would result in additional enforcement actions that would increase enforcement costs. It is difficult to estimate the increased enforcement costs at this time because the extent to which this fleet will comply with the regulations is not known.

The Environmental Assessment prepared for this action examines potential effects on resource components of the BSAI, as required by the National Environmental Policy Act. The primary effect of the action alternatives would be to provide more accurate and precise catch accounting data for Pacific cod and other species harvested in this fishery by imposing standards similar to those imposed on other quota fishery programs off Alaska. This action does not change harvest amounts, harvest locations, or season timing and no adverse impacts were identified.

The actions contemplated as part of this analysis are highly unlikely to impact the natural environment. While we believe that enhanced monitoring is a necessary part of a quota program, it is unlikely that a failure to implement the monitoring measures, detailed in Alternatives 2, 3, or 4, would result in significant impacts to the natural environment.

1.0 Regulatory Impact Review (RIR)

1.1 Introduction

This Regulatory Impact Review (RIR)[1] evaluates the costs and benefits of an action to enhance monitoring and enforcement measures used to verify the harvest of Pacific cod by freezer longline vessels[2] that operate in the Bering Sea and Aleutian Islands (BSAI) groundfish management area. The measures cover this fleet when it is operating in the Gulf of Alaska (GOA), as well as in the BSAI.[3]

In recent years BSAI freezer longline fishermen have contracted with each other to form a private cooperative that coordinates BSAI Pacific cod harvests. Moreover, in 2010, Congress passed legislation that may eventually allow the industry to create a more formal cooperative structure. Management of cooperative fishery harvests has been found to require enhanced monitoring of catch.

1.1.1 What is a Regulatory Impact Review?

This RIR is required under Presidential Executive Order (E.O.) 12866 (58 *FR* 51735, September 30, 1993).[4] 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 further 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;

[1] NMFS has not prepared an Initial Regulatory Flexibility Analysis (IRFA) pursuant to the Regulatory Flexibility Act (RFA) for this analysis. NMFS has met its RFA responsibilities by certifying that this action will not have a significant adverse economic impact on a substantial number of small entities pursuant to section 605(b) of the RFA. The certification memo is attached to this analysis as an appendix.

[2] In this analysis, this fleet is generally referred to the "freezer longliner" fleet for consistency. This reflects industry practice, as shown by the names of the Freezer Longline Coalition and the Freezer Longline Conservation Cooperative. Freezer longline is very descriptive of the nature of the operation. In some instances, often when referring to licensing or specifications, term "longline catcher/processor" is used. Regulations and specifications also refer to the gear type as "hook-and-line" gear.

[3] The measures do not apply to freezer longliners that only operate in the GOA.

[4] Queirolo (2011) describes the economic analysis required to meet the requirements of an RIR.

- 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.

1.1.2 Purpose and Need for this action

Participation in the BSAI Pacific cod longline catcher/processor sector is limited to holders of License Limitation Program (LLP) licenses authorized under the Consolidated Appropriations Act of 2005. This sector receives a specific allocation of BSAI Pacific cod each year. A sector-specific allocation, in combination with a closed-class of license holders, created an opportunity for these license holders to form a voluntary fishing cooperative to divide the sector's allocation of Pacific cod among members of the cooperative through private contractual agreements. The cooperative manages these individual allocations to ensure that individual vessels and companies do not harvest more than their agreed upon share. The Freezer Longline Conservation Cooperative (FLCC) was established in 2004, and represents owners of all 37 of the eligible LLP licenses. This has created a *de facto* catch share program for this portion of the BSAI Pacific cod fishery.

Catch share programs create new demands for enhanced catch accounting, monitoring, and enforcement. They increase the incentives for participants to misreport catch through unauthorized discards or inaccurate catch reports. Cooperative fisheries also create opportunities for collusion among members. This collusion can result in vessels with observers fishing differently from vessels without observers. As catch share programs have been implemented for other fisheries off Alaska, NMFS has developed enhanced equipment, operational, and catch accounting requirements designed to ensure accurate and precise accounting for allocated species. For catcher/processors, these regulations have consisted of:

- requirements to weigh catch on a NMFS-approved scale;
- increased observer coverage; and
- requirements to provide an observer sampling station.

In December 2010, the Longline Catcher Processor Subsector Single Fishery Cooperative Act (S. 1609) was signed by President Obama. This act provides a statutory framework for the formation of a single cooperative by this fleet. If formally requested by members, the Council and NMFS must implement a cooperative program within two years. Promulgating monitoring regulations now will reduce the difficulty of full implementation in the future. Additionally, members of the cooperative have requested that NMFS develop regulations that would allow vessel operators to weigh Pacific cod catch on scales, as an alternative to requiring two observers onboard the vessel to sample each set.

Almost all of the recent participants in the Pacific cod longline catcher/processor fishery in the GOA have operated vessels that also fish in the BSAI; and vessels frequently move between the two areas. NMFS and members of the freezer longline cooperative believe that different monitoring standards could create catch accounting, observer, and compliance issues, making it necessary to also address monitoring in the GOA for this group of vessels.

For these reasons, NMFS believes that the current monitoring regulations for these vessels must be revised to ensure that accurate catch information is obtained, so that NMFS can meet its conservation and management responsibilities.

1.1.3 Statutory authority for this action

NMFS manages the U.S. groundfish fisheries in the portion of its exclusive economic zone within the BSAI and GOA according to the Fishery Management Plan (FMP) for Groundfish of the Bering Sea and Aleutian Islands Management Area and the FMP for Groundfish of the Gulf of Alaska. These were prepared by the Council under the authority of the Magnuson-Stevens Fishery Conservation and Management Act. Regulations governing fishing by U.S. vessels in accordance with the FMPs appear at subpart H of 50 CFR part 600 and 50 CFR part 679.

1.1.4 Description of the alternatives

This analysis examines four alternatives: (1) no action, (2) required use of motion-compensated scales, (3) required increased observer coverage, and (4) vessel operator choice of motion-compensated scales or increased observer coverage.

This action would affect vessels that are part of the longline catcher/processor subsector as defined in the Consolidated Appropriations Act of 2005, section 219(A)(6), which states:

> LONGLINE CATCHER/PROCESSOR SUBSECTOR.—The term ''longline catcher/processor subsector'' means the holders of an LLP license that is noninterim and transferable, or that is interim and subsequently becomes noninterim and transferable, and that is endorsed for Bering Sea or Aleutian Islands catcher/processor fishing activity, C/P, Pcod, and hook and line gear.

The group of owners that currently possess an LLP license meeting the definition above will be considered the impacted entities for this analysis. There are currently 37 LLP licenses, associated with 33 vessels, in the universe of impacted entities (Table 1). There is one LLP license that is not currently associated to any specific vessel, and there are three vessels that have two LLP licenses stacked on them. LLP licenses can be moved from vessel to vessel, can be stacked on vessels, and can go unused during the course of a year. Thus, the actual number of vessels participating in future in this fishery may differ from the number currently participating.

For the purpose of summarizing historical data, all catcher/processor vessels that participated in a directed fishery for Pacific cod in the BSAI were considered. Some of these vessels are currently owned by entities that hold an LLP license, while other vessel owners sold their LLP license, did not qualify for an LLP license, or are no longer active in fisheries.

For the purpose of projecting costs under the alternatives, NMFS focused on the number of separate vessels currently operated in this fishery by owners holding LLP licenses, not on the number of separate licenses. The costs of this action will be related to the number of separate active vessels, rather than the number of licenses. This approach captures the number of current vessels; this may also provide an upper bound to cost estimates, if rationalization leads to a reduction in the number of active vessels.

Table 1 The License Limitation Program (LLP) licenses that meet the definition of the Consolidated Appropriations Act of 2005 and the vessel with which they are currently associated.

License	Current Vessel Name	AI endorsement	Pacific cod endorsements
LLG2892	ALASKA MIST	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG2238	ALASKAN LEADER	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG2112	ALASKAN LEADER	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG3090	ALEUTIAN LADY	Y	AI CP POT; BS CP POT; WG CP HAL; BS CP HAL; WG CP POT; AI CP HAL
LLG5222	GLACIER BAY	Y	BS CP HAL; AI CP HAL
LLG1578	BARANOF	Y	AI CP HAL; WG CP HAL; BS CP HAL
LLG3617	BEAUTY BAY	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG3609	BERING LEADER	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG3681	BERING PROWLER	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG4508	BLUE ACE	Y	BS CP HAL; AI CP HAL
LLG2783	BLUE ACE	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG2421	BLUE ATTU	N	BS CP HAL
LLG2959	BLUE BALLARD	Y	BS CP HAL; BS CP POT; AI CP POT; AI CP HAL
LLG3973	BLUE GADUS	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG2081	BLUE NORTH	Y	AI CP HAL; WG CP HAL; CG CP HAL; BS CP HAL
LLG3847	BLUE PACIFIC	Y	BS CP HAL; AI CP HAL
LLG3602	BRISTOL LEADER	Y	AI CP HAL; WG CP HAL; BS CP HAL
LLG1916	CLIPPER ENDEAVOR	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG3616	CLIPPER EPIC	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG1713	CLIPPER EXPRESS	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG1917	CLIPPER SURPRISE	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG1576	COURAGEOUS	Y	BS CP POT; AI CP POT; CG CP HAL; BS CP HAL; WG CP HAL; AI CP HAL
LLG1989	DEEP PACIFIC	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG1125	FRONTIER EXPLORER	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG1127	FRONTIER MARINER	Y	BS CP HAL; AI CP HAL
LLG1128	FRONTIER SPIRIT	Y	AI CP HAL; CG CP HAL; BS CP HAL
LLG1401	KJEVOLJA	Y	AI CP HAL; WG CP HAL; BS CP HAL
LLG1988	LILLI ANN	Y	BS CP HAL; AI CP HAL
LLG1785	NORTH CAPE	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG2958	OCEAN PROWLER	N	CG CP HAL; BS CP HAL
LLG2026	PATHFINDER	Y	AI CP HAL; WG CP HAL; BS CP HAL
LLG3676	PROWLER	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG4008	SIBERIAN SEA	Y	BS CP HAL; AI CP HAL
LLG4823	SIBERIAN SEA	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG3637	U.S. LIBERATOR	Y	BS CP HAL; AI CP HAL
LLG1400	ZENITH	Y	AI CP HAL; CG CP HAL; WG CP HAL; BS CP HAL
LLG2085		Y	BS CP HAL; AI CP HAL

Key to endorsement codes: (BS: Bering Sea; AI: Aleutian Islands; WG: Western Gulf; CG: Central Gulf; CP: catcher/processor; HAL: hook-and-line)
Notes: Three vessels (Northern Aurora [LLG2678], Horizon [LLG3843], and Western Queen [LLG3936]) and an unattached license (LLG3961] were bought out of the fishery in 2007 (72 FR 20836, April 26, 2007). All licenses listed carried a Bering Sea endorsement.
Source: RAM LLG license file from May 2011; Buck, pers. comm., May 17, 2011.

Alternative 1: No Action

NMFS anticipates that the current action will become effective in January 2013 (Watson, pers. comm., March 28, 2011). Therefore, the "no action" alternative includes other actions that are not effective now, but that will be effective in January 2013, even if the action analyzed here is not taken.

In October 2010, the Council adopted an observer restructuring program (Council 2010b: 1), and NMFS is preparing the rule to implement this program. It is expected that the rulemaking for the observer restructuring program will be effective in January 2013 (Gerke, pers. comm., March 28, 2011). Therefore, the "no action" alternative assumes a restructured observer program.

Key regulations governing observer coverage in this fleet may be found in 50 CFR 679.50 (observer coverage requirements), 50 CFR 679.28 (equipment and operational requirements), and 50 CFR 679.32 (groundfish community development quota [CDQ] catch monitoring requirements).

In August 2010, the BSAI Pacific cod freezer longline fleet formed a cooperative to coordinate the efficient harvest of the fleet's Pacific cod allocation. This fleet harvests Pacific cod from its specification's allocation, but also uses Pacific cod CDQ, made available by CDQ groups. The regulation of CDQ harvest is directly addressed in the Magnuson-Stevens Fishery Conservation and Management Act at section 305(i)(1)(B)(iv). This paragraph states:

> *The harvest of allocations under the program for fisheries with individual quotas or fishing cooperatives shall be regulated by the Secretary in a manner no more restrictive than for other participants in the applicable sector, including with respect to the harvest of non-target species.*

At the time the cooperative was formed, regulations governing the freezer longline fleet required vessels fishing for CDQ groundfish to carry two observers; vessels not engaged in the CDQ fisheries were only required to carry a single observer, if greater than or equal to 125 feet length overall (LOA), or a single observer during 30 percent of their fishing days, if under 125 feet LOA.

Since non-CDQ fishing in this fleet is now governed by a cooperative, the CDQ rules, under the no action alternative, have been modified to require the same coverage levels as the non-CDQ fisheries. On May 31, 2011, the Regional Administrator for the AKR sent a letter to the Western Alaska Community Development Association indicating that that change was effective (NMFS 2011d). A proposed rule governing the regulation of CDQ groups in the presence of cooperatives formed pursuant to regulation, was published on July 13, 2010 (75 FR 39892). A final rule, modified to apply to voluntary cooperatives not subject to regulation as well, is in preparation.[5] Thus, the no action alternative requires a single observer for freezer longliners fishing for CDQ Pacific cod.

Table 2 provides a summary of the key elements of the "no action" alternative (Alternative 1). The elements associated with the other alternatives are also summarized in the table. Table 3 (on page 11) summarizes the key changes that Alternatives 2, 3, and 4 make to the "no action" alternative.

[5] The proposed rule was published in July 2010 and the freezer longline cooperative was formed in August 2010. The proposed rule did not contemplate applying this provision to the freezer longline fleet (75 FR 39894); however, NMFS anticipates that the fleet will be covered by the provisions of the final rule (Davis, pers. comm., May 2, 2011)

Table 2 Summary of the monitoring requirements under each of the alternatives.

Alternative	Description
Alternative 1: No action	• All catcher/processors are required to carry one observer on board for 100 percent of fishing days. • Regulations at 679.50(g) describe the basic accommodations vessel operators must make for observers. These govern accommodations and food, safety, measures to facilitate observer data transmission, access to information about vessel position, vessel workspaces, and records, prior notification when fish are brought on board, other reasonable assistance, and rules governing transfers at sea.
Alternative 2: Scales	• Vessels must comply with the requirements of the observer restructuring program. • The vessel must carry a lead level 2 observer at all times while Pacific cod is open to directed fishing by these vessels in the BSAI or GOA and at all times while groundfish CDQ fishing. The lead level 2 requirements would be modified to require 30 sampled sets, rather than 60. • The vessel must provide an observer sampling station that complies with 50 CFR 679.28(d). • While directed fishing for Pacific cod with longline gear in the BSAI or GOA when this fishery is open, the owner or operator of the vessel must ensure that all Pacific cod brought onboard the vessel are weighed on a NMFS-approved scale in compliance with the scale requirements at '679.28(b). Each haul must be weighed and recorded separately. For the purpose of accounting for Pacific cod catch, NMFS will use the weight of all catch that passes over the scale. • Depending on where the scale is installed, NMFS will apply a different product recovery rate (PRR) to the weight of Pacific cod: if the scale is installed before the fish are bled, a PRR of 1.00 will be applied; if the scale is located between the point where fish are bled and prior to the bleeding holding area, a PRR of 0.99 will be applied; and if the scale is located after the holding area, a PRR of 0.98 will be applied. • The area upstream from and including the scale must be subject to video monitoring. • The owner or operator of the vessel must comply with the requirements for electronic logbooks at '679.5(f) • Eliminate alternative fishing plan requirement
Alternative 3: Increased Observer Coverage	• Vessels must comply with the requirements of the observer restructuring program. • At least two observers must be aboard the vessel on all fishing days while Pacific cod is open to directed fishing in the BSAI or GOA, or while groundfish CDQ fishing. At least one of the observers must be certified as a lead level 2 observer, as described at paragraph 679.28(j)(1)(v)(E). The lead level 2 requirements would be modified to require 30 sampled sets, rather than 60. More than two observers are required if the observer workload restriction at paragraph (c)(8)(iii) of this section would otherwise preclude sampling as required under '679.100(b)(1))(iv). • The vessel must provide an observer sampling station that complies with 50 CFR 679.28(d).

	• The owner or operator of the vessel must comply with the requirements for electronic logbooks at '679.5(f) • Eliminate alternative fishing plan requirement
Alternative 4: Choose between scales or increased observer coverage	• Each year, vessel owners would be allowed to select between measures described under alternative 2 or alternative 3. • Selection of monitoring alternative would have to be made by November 1st . • Once a vessel owner has made an election, the owner would be required to operate under that monitoring alternative for the entire fishing year. • Eliminate alternative fishing plan requirement.

Under the restructured observer program, catcher/processors will be required to carry 100 percent observer coverage, obtained by contracting directly with observer companies (as they do now). This 100 percent coverage requirement covers all catcher/processors (with the exception noted below), and does not depend on vessel length. This requirement is subject to the following exemption for certain catcher/processors: catcher/processors less than 60 feet LOA with a history of catcher/processor and catcher vessel activity in the same year, or catcher/processors with an average daily production of less than 5,000 pounds (round weight equivalent) in the most recent full calendar year of operation prior to January 1, 2010. These latter operators could make a one-time decision to participate in the less than 100 percent sector and pay an ex-vessel value based fee, or participate in the 100 percent coverage sector as described.[6] (Council 2010b: 1) None of the vessels in the freezer longline fleet are expected to be eligible to take advantage of this Restructured Observer Program exemption. (Kimball, pers. comm., May 2, 2011)[7]

Alternative 2: Scales

The measures included under Alternative 2 are summarized in Table 2.

Because freezer longliners catch Pacific cod as bycatch when they are targeting other species, and this bycatch will be accounted against the total sector allocation, NMFS would require the monitoring measures at all times while Pacific cod is open to directed fishing by these vessels in the BSAI or GOA, and at all times while groundfish CDQ fishing. NMFS contemplated having these measures apply only when these vessels were targeting Pacific cod, but because of the nature of this fishery, it is often difficult to determine when the vessels are targeting Pacific cod.

Under this option, the owner or operator of a vessel subject to the regulations who does not intend to directed fish for Pacific cod, or conduct groundfish CDQ fishing at any time during the upcoming year, must notify NMFS by November 1 of the current year (using a standard form supplied by NMFS) that they intend to opt out of these fisheries. Thus, a vessel that did not intend to operate as described in 2015, would have to opt out by November 1, 2014. A vessel that opts out in this way, cannot engage in the listed activities for the covered calendar year (that is, in this example, in 2015). A vessel that opts out would still be eligible to engage in directed fishing for Pacific cod in the GOA, all else equal. It is expected under a cooperative scenario that vessels subject to these regulations may wish to exclusively

[6] This exemption was provided in order to provide some flexibility for the smallest class of catcher/processors, and those vessels that currently operate as both a catcher/processor and catcher vessel during the year, to determine their observer coverage category and fee system. (Council 2010: 1)

[7] The qualifications for observers required in this fleet under the restructured observer program are no different than the requirements under the current program. Current requirements do not include a requirement that the observer be a "Level 2" observer, or a "Lead level 2" observer. §(679.50(c)(1)(iv) and (v).

fish for other species, such as Greenland turbot, and lease their allocation of Pacific cod to other vessels. These vessels would continue to catch some amount of Pacific cod as bycatch. The opt out provision would allow these vessel to fish without the additional monitoring requirements as the expected amount of Pacific cod they would retain would be minimal.

Vessels are required to carry and use motion compensated scales[8] to weigh all Pacific cod harvested with longline gear while the Pacific cod season is open. NMFS regulations governing the use of scales at sea are summarized in regulations at §679.28(b). A scale must be included on the NMFS Alaska Regional Administrator's list of scales eligible to be approved for weighing catch at sea. Scales must be inspected and approved by a NMFS staff scale inspector, or an inspector designated and trained by NMFS, before vessels may participate in any fishery requiring the weighing of catch at sea using an approved scale. Each scale must be re-inspected within 12 months of the previous inspection. Vessel operators must test each scale or scale system in the presence of the observer one time during each 24-hour period, when use of the scale is required.

The scale weight would not account for drop offs or discard upstream from the bleed tank. In order to get an estimate of total cod catch under this option, an observer estimate of drop offs would be added to be added back into the scale weight to generate the total estimated cod catch for the set. For species other than Pacific cod, the standard observer sampling methodology and resulting estimates would be used. Given that only one observer will be required under this option, NMFS will use the current methodology of extrapolating Pacific cod drop offs and all other species besides Pacific cod to unsampled sets.

At the time of the scale inspection, the vessel owner or operator will also receive a PRR designation depending on the location of their scale in relation to the location of the bleeder and the bleed holding area. If the scale is located upstream of the location where Pacific cod are bled, a PRR of 1.00 or a whole weight will be applied to all Pacific cod weighed on the scale. If the Pacific cod are bled and then placed in a bleeding holding area prior to being weighed on the scale, then the standard PRR for bled Pacific cod will be applied(0.98), as these fish are expected to bleed completely. Members of this fleet expressed an interest in receiving a different PRR if the Pacific cod are bled prior to the scale but before the bleeding holding area. Results from an unpublished study, conducted in July 2010, indicate that a PRR of (0.99) is appropriate applied if Pacific cod are bled within 30 seconds of going over the flow scale. A draft of study can be found in Appendix 2.

The owner or operator of a vessel subject to this action must provide and maintain a NMFS-approved electronic monitoring system at all times when engaged in fishing operations in the BSAI. The system must include cameras, a monitor, and a digital video recorder, and must provide coverage for all areas upstream from and including the scale where sorting and weighing of Pacific cod catch could occur. The cameras must make it possible to observe all areas where Pacific cod are sorted from the catch, all fish passing over the motion compensated scale, and all crew actions in these areas. The system must have enough storage capacity to hold all the video data collected during an entire trip. Video frames must be time and date stamped. Vessel owners or operators must arrange for NMFS to inspect the electronic monitoring system and they must maintain a current NMFS-issued electronic monitoring system inspection report onboard the vessel at all times when the vessel is required to provide an approved system. The video data must be maintained onboard the vessel for 120 days, unless NMFS has approved

[8] Motion compensated scales use a second weighing assembly to continuously weigh a reference weight of known mass. As the scale rises, the apparent weight of the known mass increases, and as the scale falls, the apparent weight decreases. Since the forces acting on the product being weighed cause the same deviations from the true mass, the scale electronics are able to use this information to constantly correct the apparent weight measured by the primary weighing assembly. (Kinsolving, pers. comm., June 30, 2011)

a shorter period. The video data must be made available to NMFS staff, or other persons approved by NMFS, upon request, and the vessel must carry a monitor that can display the output from all the cameras included in the system at the same time.

Observer sampling station requirements, referred to in Table 2, are described in detail in 50 CFR 679.28(d). The station must be located within 5 meters of a collection area where the observer can see the longline gear being retrieved, and can collect fish as they come off the line. Unobstructed passage from the collection area to the sampling station must be provided.[9] The station must have a working area of at least 4.5 square meters, including an observer's sampling table. The table must be at least 0.6 meters deep, 1.2 meters wide, and 0.9 meters high (but no more than 1.1 meters high). The sampling station must include a NMFS-approved platform scale with a capacity of at least 50 kilograms, located within one meter of the sampling table. The weighing surface can be no more than 0.7 meters above the floor. The station must include flooring that prevents slipping and drains well, adequate lighting, and a hose that supplies fresh or sea water to the observer.

A Level 2 endorsement means that an observer has completed 60 days of observer time, and has received an evaluation for their most recent deployment indicating that they met Observer Program expectations. A Level 2 "lead" observer endorsement for a vessel using non-trawl gear (which is the case for the vessels affected by this action) also requires that the observer has completed two cruises or contracts of at least 10 days duration each, and sampled at least 60 sets on a vessel using non-trawl gear (either longline or pot gear). Under this alternative (and the other alternatives under consideration for this action), a lead level 2 observer would be required; however, qualification requirement for a lead level 2 observer for non-trawl gear would be reduced from 60 sampled sets to 30 sampled sets.

Freezer longliners would also be required to report all Pacific cod catch at the haul level, using an electronic logbook, so that the data are readily available to NMFS in an electronic format. This requirement is necessary to collect data on the weight of Pacific cod at a finer resolution than the daily total, currently required in production reports. The electronic logbooks would replace the currently required catcher/processor trawl daily cumulative production logbook (DCPL) paper logbooks . The discard, disposition, and production information, formerly recorded in the DCPL, would be entered through eLandings. This new step would remove the requirement for the freezer longliners to record any information in the DCPL and, thus, remove the catcher/processor longline/pot DCPL from use for these vessels. The electronic logbooks would be an additional component to "eLandings", the program through which the operators of catcher/processors currently submit their daily production reports.

Freezer longliners subject to this action frequently fish for Pacific cod in the GOA, as well as the BSAI. These vessels may move back and forth between these two areas without completing an offload, and may fish in both areas during the same trip. The regulations required by these freezer longliners in the GOA would be different than those required in the BSAI. If observer restructuring is in effect at the time these regulations are developed, then freezer longliners in the GOA would be required to have 100 percent observer coverage. If the freezer longliners subject to this action have to switch from using the flow scale to account for Pacific cod harvest, to using the observer data to account for Pacific cod harvest, it would be difficult to ensure that the catch accounting data were coming from the correct data stream (scales or observer). Additionally, if the vessels were required to switch back and forth between scales and observer data for accounting for Pacific cod catch, it would be more difficult for NMFS to ensure that these vessels were correctly complying with the requirements. Therefore, freezer longliners subject to this action will also be required to maintain the scales option at all times when fishing in the GOA when Pacific cod is

[9] Unobstructed is defined as passageways at least 65 cm wide at their narrowest point, be free of tripping hazards, and be at least 1.8 meters high. (50 CFR 679.28(d)(2)(iii)).

open in both the BSAI and the GOA. This action is not designed to apply to all freezer longliners fishing in the GOA; freezer longliners that only fish in the GOA are not subject to the requirements of this action.

Current CDQ regulations allow freezer longline vessels to submit an alternative fishing plan to NMFS, allowing these vessels to fish CDQ with only one, lead level 2 certified, observer. Under all of the alternatives, the option to fish CDQ under an alternative fishing plan will be removed. Alternatives 2, 3, and 4 will require either two observers, one of whom must be a lead level 2 observer, or a motion compensated scale and one lead level 2 qualified observer, at all times when Pacific cod is open in the Bering Sea and while the vessel is engaged in groundfish CDQ fishing. The option for a freezer longliner fishing CDQ groundfish to fish under an alternative fishing plan will no longer be a viable option.

Alternative 3: Increased observer coverage

The measures included under Alternative 3 are summarized in Table 2. Under this alternative, vessels would be required to carry a second observer 100 percent of fishing days while Pacific cod is open to fishing in the BSAI or GOA, or while CDQ groundfish fishing. Other requirements are similar to some of those for the Alternative 2: one observer must be lead level 2 qualified, the vessel must provide an observer sampling station, and the vessel must carry and utilize an electronic logbook. These requirements are treated in more detail in the discussion of Alternative 2. Under this alternative, vessel operators would have to notify NMFS by November 1, if they intend to opt out of the directed fishery for Pacific cod or the CDQ groundfish fishery in the coming year. The requirement is similar to the notification requirement in the scales option.

Alternative 4: Scales <u>or</u> increased observer coverage

Under this alternative, the owner or operator of a vessel that intends to fish for Pacific cod in the upcoming year, must not only notify NMFS by November 1 of the preceding year, but must also indicate whether it plans to comply with monitoring and enforcement requirements by using motion compensated scales, or by carrying a second observer. Once the selection is made, the vessel owner or operator would not be able to change it during the year for which it was made (for example, a vessel operator who chose scales on November 1, would not be able to switch from scales to a second observer in July of the following year).

Vessels would not be allow to switch between monitoring options, because the methods used to debit the catch in the NMFS catch accounting database are very different. It would be difficult for NMFS to alter these methods in the middle of a fishing year and ensure that correct Pacific cod catch was deducted from the quota. Also, monitoring for compliance with the options would be difficult to enforce if vessels were allowed to switch between the two options. Finally, vessels could potentially game the system by deciding when and where it would be most beneficial to take additional observers over using scales.

A vessel whose owner or operator selects the scales option would be subject to the requirements of Alternative 2 to this action (discussed above), while a vessel whose owner or operator selects the increased observer coverage option would be subject to the requirements of Alternative 3 (discussed above). Alternative 4, thus, provides owners and operators two different approaches to meeting monitoring and enforcement objectives. The increased observer coverage approach is more labor intensive; the scales approach substitutes increased capital (scales and video monitoring) to offset the reduction in labor inputs, while maintaining an adequate level of monitoring. Table 3 shows how Alternatives 2 and 3 (i.e., the scales and observer options of Alternative 4) differ when contrasted to the no action alternative.

In summary

Table 3 summarizes the key differences between the No Action Alternative 1, and Alternatives 2, 3, and 4. Although the scales and second observer alternatives differ with respect to the key measure adopted, there is some overlap in terms of other elements added by the alternatives (for example, the electronic logbook).

Table 3. The requirements of Alternatives 2 and 3 (or scales and increased observer coverage options of Alternative 4) contrasted with those of the no action alternative

Program element	What Alternative 2, or the scales option of Alternative 4, add to the no action alternative	What Alternative 3, or the increased observer coverage option of Alternative 4, add to the no action alternative
Motion compensated flow scales	+	0
Video monitoring	+	0
Lead level 2 observer	+	+
Second observer	0	+
Observer station with platform scales	+	+
Electronic logbook	+	+
Remove CDQ alternative fishing plan option	+	+
Note "+" indicates that the alternative or option in the heading imposes a condition not required under the "no action" alternative. "0" means that this alternative does not add the indicated requirement. Source: Text in Section 1.1.4		

Alternatives considered and rejected without detailed analysis.

In the freezer longline fishery, virtually all Pacific cod are processed into one of two head and gut products: western (head removed just in front of the collar bone) or eastern cut (head removed just behind the collar bone). Because there are a limited number of products, industry has suggested that quota accounting for Pacific cod be accomplished by weighing all of the processed product and using NMFS published product recovery rates (PRRs) to estimate the round weight of retained Pacific cod.

In order to get an estimate of total Pacific cod catch under this approach, an observer estimate of drop offs and a vessel or observer estimate of in-factory discards would be added to the estimated round weight of retained Pacific cod. For species other than Pacific cod, the standard observer sampling methodology and resulting estimates would be used.

On most freezer longline vessels, fish enter a trough below the bleed tank where the operator of the heading machine is able to grab individual fish and pass them through the heading equipment. Depending on the size of the fish, the operator will choose to pass the cod through a machine set up for eastern cut, or a machine set up for western cut. Following heading, the fish are gutted and sent to a panning station. At the panning station, an operator sorts the fish by size, cut, and species and prepares them for freezing. After the individual pans are frozen, the fish are glazed with water and packaged for long-term freezing. (NMFS 2010a: 5-6)

Because different vessels apply different amounts of glaze, the logical place to determine product weight would be after the product is frozen and before it is glazed. Under this approach, vessels would be

required to be equipped with a motion compensated scale capable of printing a label and retaining the weight of each pan of fish in memory. Prior to glazing, the operator would weigh each pan of fish and print a label showing the weight of that pan. After glazing and bagging, the label would be affixed to the bag. Each day, the vessel would be required to print the total weight for the day and the number of bags weighed. These data would be used to calculate the weight of retained cod. (NMFS 2010a: 6)

This approach has the advantage of producing a record of Pacific cod catch that can be audited comparatively simply. Currently in this fishery, NOAA Office of Law Enforcement (OLE) may audit an offload by counting cases offloaded and multiplying the count by a standard case weight which is developed by weighing sample cases from throughout the offload. The total offload weight is compared to amounts reported in corresponding production records. Under the proposed approach, NOAA OLE could audit the cases during the offload and check for weight labels. If a case did not have a label, it would be clear that the weight had not been recorded. NOAA OLE could also check the weights of individual cases of product against the label to ensure that product was completely weighed. (NMFS 2010a: 6)

There are a number of disadvantages and complications with a PRR based approach. NMFS has PRRs for Eastern (0.47) and Western (0.57) cut Pacific cod. However, there has been no recent work done to assess those rates. Nor were these rates developed with the intent of using them for managing a quota program. Finally, one of the advantages of quota based management is that by ending the "race for fish" vessel crew are able to fish and process catch more slowly, thereby potentially improving recovery. If a static rate is used, vessel owners have no incentive to improve recovery since any additional recovery would erroneously be translated into additional round weight that would be debited from the vessel's quota. Industry has suggested that recovery rates could be assessed by observers on an ongoing basis, and NMFS could periodically publish revised rates. On a fleet wide level, this would create an incentive for improving recovery and would also provide NMFS with additional data for determining the precision and accuracy of the published rates. However, NMFS believes that making ongoing revisions to recovery rates would place too much additional burden on observers and is not practical. (NMFS 2010a: 6)

The PRR based proposed approach also presents a variety of limitations and complications regarding the estimate of Pacific cod discard. Monitoring the amount of in-factory discard would be difficult. Because observers must spend much of their time watching the line as it comes on board, it would not be possible for an observer to consistently monitor for in-factory discard. NMFS has not independently assessed the amount of in-factory discard, nor do we believe that the amount of that discard would necessarily remain the same under any form of quota based management. Industry sources indicate that the amount of in-factory discard is fairly small, but this unknown represents a significant accounting difficulty associated with this approach. To the extent that the amount of in-factory discard is comparatively small, it may be possible to require that factories be designed to prevent discard of fish except at specified times when the discard can be observed. (NMFS 2010a: 7)

Observers currently estimate drop-offs as part of the regular sampling routine. The basis for the observer sample, and for the current catch accounting system, is the individual set. Unfortunately, Pacific cod are not currently kept segregated by set, once they enter the factory and designing a system that ensured fish from individual sets stayed together until they were weighed and packaged could be problematic. Unless such a system could be designed, the weight of Pacific cod under this approach would be based on the production day, whereas the weight of the Pacific cod drop offs would be based on the individual set. To further complicate matters, the observer would still be required to estimate Pacific cod catch for each set in order to generate an estimate of total catch for the set. Because of variance in the observer and recovery rate estimates, and the inability to attribute the estimated Pacific cod weight from product to an individual haul, the two separate estimates of Pacific cod catch would not be expected to agree closely. (NMFS 2010a: 7)

NMFS did not determine what level of observer coverage would be required under this approach. However, without multiple observers, it would be impossible to ensure that discard and drop off rates were not higher when an observer was not on duty. Nor would it be possible to monitor in-factory discard. On some vessels, there is very limited space between the freezers and the area where casing occurs and it would be necessary to modify the factory to create sufficient space for a weighing station. It might be possible for vessels that already have a label printing scale on board to reprogram the scale to meet the new printout requirements; however, in most cases vessels would be required to purchase a new scale system. Based on informal discussions with vendors, such a system, including spare parts, wiring, and training would probably cost approximately $75,000. (NMFS 2010a: 7)

While this approach, based on weighed product and the standard PRRs, could be implemented at comparatively low cost, NMFS does not believe that it is suitable for accounting in a quota based fishery. There are insufficient data to assess the accuracy and precision of existing recovery rates and believe that this approach could inhibit vessels from improving recovery rates. An alternative approach has not been developed yet to effectively monitor and account for in-factory discard or to effectively merge observer discard data collected at the set level with production data collected at the production day level. (NMFS 2010a: 7)

1.1.5 History of this action

Since 2000, the freezer longline sector has received a sectoral allocation of Pacific cod in the BSAI. Since 2003, the freezer longliner vessels authorized to target Pacific cod in the BSAI have been defined by LLP endorsements. In December 2009, the Council took final action to implement sector allocations (including allocations to the freezer longline fleet) in the Western and Central GOA. The combination of a closed-class of vessels and a sector-specific allocation of Pacific cod has created the opportunity for these vessels to form a voluntary cooperative that would potentially create a de facto catch share program. (NMFS 2010a: 1)

Programs that allocate catch, bycatch, or prohibited species catch (PSC) to individual entities, or to an organized closed class of entities, impose new demands on NMFS to provide defensible and precise estimates of removals for quota management. Therefore, the general management approach changes with such allocations, since entities that receive allocations are generally prohibited from exceeding those allocations, and if an allocation is exceeded, NMFS may initiate enforcement actions against the entity. These programs also impose additional burdens on industry to monitor their own allocations of catch and to cease fishing when those allocations are reached, which requires that program participants have quick access to catch accounting data, so that they can monitor their quotas. Participants are also very concerned that the data used for management and quota accounting precisely reflect catch at small scales, such as the individual set, haul, or delivery. These demands have led to the development of a method of quota accounting where all quota species are weighed or counted. Such approaches are very precise in their estimates of catch and are highly defensible. (NMFS 2010a: 1)

Industry members of the freezer longline fleet have indicated to NMFS that they believe NMFS's estimates of Pacific cod catch are too high. Their observations are based on the amount of product produced and the use of published PRRs to back calculate the round weight of retained catch. The crew adds an estimate of the amount of fish discarded prior to processing to their estimate of retained catch to get an estimate of the total catch. Based on these concerns, NMFS initiated a Pacific cod catch accounting research project in 2003. However, because of issues with data quality and the loss of a portion of the raw data, NMFS was not able to verify the research results and the issue was not resolved. (NMFS 2010a: 1)

The industry recognizes the catch monitoring and catch accounting demands under a quota program. During the late summer of 2009, NMFS and the Freezer Longline Coalition (FLC) held several informal meetings to discuss a proposal by the FLC concerning revised catch monitoring and catch accounting methodologies for the freezer longline fishery. Following these discussions, NMFS staff and the FLC agreed that the best approach for continuing work on these issues was to bring them forward through the Council process. At the October 2009 meeting of the Council, Mr. Kenny Down, representing the FLC, requested that a discussion paper on improved catch accounting in the Pacific cod longline catcher/processor fishery be prepared. The Council concurred with Mr. Down's request and NMFS staff was tasked with the preparation of the paper. (NMFS 2010a: 2)

Since it seemed very likely that a voluntary quota program for the Pacific cod freezer longline fishery would develop, the purpose of the paper was to inform the Council of NMFS' perspective on monitoring and catch accounting needs under such a program. A regulatory amendment and associated analysis would be required to implement new monitoring and enforcement requirements for the freezer longline fleet. New monitoring and enforcement provisions could be assessed by the Council and implemented as a provision of regulations governing any legislated or Council initiated cooperative allocation, or as standalone provisions in the event a voluntary cooperative was formed without the benefit of further Congressional or Council action. (NMFS 2010a: 2)

NMFS staff held a public workshop in Dutch Harbor on December 1, 2009, to learn about the vessels participating in the freezer longline fishery. Following this workshop, NMFS staff visited 21 freezer longline vessels in Dutch Harbor and Seattle and discussed catch handling protocols and factory operations with vessel crew. (NMFS 2010a: 2)

In July 2010, NMFS staff accompanied the freezer longliner F/V *Bristol Leader* to observe the operation of a flow scale recently installed on the vessel, and to investigate the process of bleeding Pacific cod and the issues associated with weighing bled fish. (Appendix 2)

In the summer of 2010, the FLCC enlisted the membership of all firms holding LLP licenses with endorsements allowing catcher/processor vessels to target BSAI Pacific cod with longline gear. Starting in August 2010 with the "B" season fishery, and during 2011, the cooperative began to divide the sectoral total allowable catch (TAC) allocation among the individual firms and vessels in the sector. This effectively introduced an individual quota program in the sector, albeit one based on private contracts among participants rather than regulation. (Down, pers. comm., August 23, 2010)

In the fall of 2010, Congress passed and the President signed the "Longline Catcher/Processor Subsector Single Fishery Cooperative Act" describing the way a cooperative might be created through federal regulation, and describing the nature of any such cooperative (U.S. 2010). The Council has not acted to implement the cooperative authorized by this act.

On May 10, 2011, NMFS staff and industry representatives met for a workshop on freezer longline monitoring and enforcement in Seattle. NMFS sought to solicit input from owners and operators of freezer longliners engaged in the Pacific cod fisheries off Alaska about potential regulatory changes to equipment and operational requirements in order to enhance catch monitoring in the fleet. (76 *FR* 21705; April 18, 2011).

In October 2011, NMFS staff provided the Council with a preliminary draft of the RIR/EA for the action, and briefed the Council on the status of the regulatory proposals. The Council also received a letter, signed by representatives of each of the five observer companies, that described their concerns about their ability to meet the observer needs of the freezer longline fleet if each of the vessels was required to carry an observer with lead level 2 certification. The company representatives indicated that they would not be

possible to provide enough lead level 2 observers to allow the fleet to fully harvest its quota. The letter pointed to the limited opportunities for accumulating necessary experience within the freezer longline fleet itself, if all or most of the vessels chose a scales option, as well as the limited opportunities within the catcher vessel fleet.

Following the October meeting, NMFS staff reviewed the lead level 2 requirements, and proposed a relaxation in the lead level 2 experience requirement as a way of addressing observer industry concerns. NMFS proposed reducing the requirement for 60 sampled sets to 30 sampled sets. A new section has also been added to the RIR, addressing the lead level 2 requirement in more detail, and discussing its implications.

A draft of this RIR was made available during the proposed rule process for public review and comment. NMFS received several comments regarding the details and availability of lead level 2 observers. NMFS adjusted the language in Section 3.1.4 to reflect these comments. No other changes were made to this document as a result of public comment.

1.2 Description of the freezer longline sector

1.2.1 Technology, gear, operations, markets

The vessels in this sector are 58-foot to 196-foot[10] catcher/processors using longline gear in the BSAI. Some of these vessels also target Pacific cod in the GOA. Operations covered under this rule would be regulated in the GOA, as well as in the BSAI. This action does not, however, directly regulate freezer longliners that have LLP licenses to target Pacific cod only in the GOA.

Since January 1, 2003, vessels have been required to have a "Pacific cod longline catcher/processor" endorsement on their LLP license in order to target BSAI Pacific cod with longline gear and process it onboard. The Consolidated Appropriations Act of 2005 (section 219(a)(1)) defined eligibility in the longline catcher/processor sector as the holder of an LLP license that is transferable, or becomes transferable, and that is endorsed for catcher/processor fishing activity in the BS or AI, Pacific cod, and longline gear. (Council, 2007: 104)

In past years, the vessels in this sector generally began fishing for Pacific cod on January 1, and continued until the initial seasonal allocation was fully harvested by February, March, or April. They subsequently returned to fishing Pacific cod from August 15, when the next halibut prohibited species catch (PSC) allowance became available, through November or December. In 2011, the "A" season remained open until June 10 because the introduction of the voluntary cooperative slowed the harvest rate and spread out effort. Also in 2011, the harvest specifications for halibut PSC in this fleet were modified, to release the halibut PSC limit on June 10, as well as August 15. Thus, in 2011, this fleet is expected to operate during more of the year than in the past. (Council, 2007b: 104; 76 *FR* 11152, March 1, 2011) As of July 17, 2011, this fishery had already had more open days available for fishing than the total days available in each of the full years from 2004 through 2010 (Table 10).

Fishing Vessel Operations

The primary target species in the freezer longline fisheries are Pacific cod, sablefish (black cod), and Greenland turbot. In addition, longline vessels also may retain incidentally caught species such as skates, rockfish, arrowtooth flounder, and pollock. Retention of incidental species depends on fishing

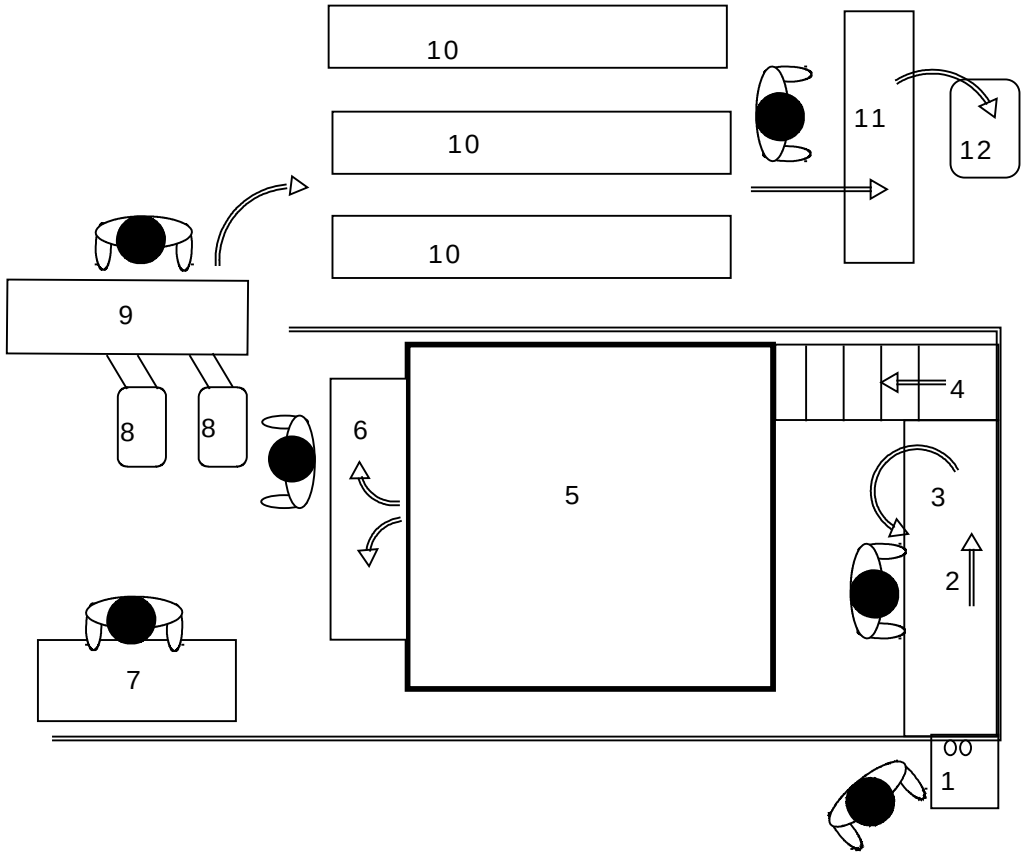
[10] Length overall or LOA. Source: Alaska Fisheries Information Network (AKFIN) data dated July 21, analyzed by AKR.

regulations, such as Increased Retention/Increased Utilization, and Maximum Retainable Allowances, as well as market price and the pace of fishing. (NMFS 2010a:2))

Freezer longliners in the North Pacific fish with baited hooks on a line that lies on or near the sea floor. The "backbone" of the gear is "groundline." Hooks are attached to the groundline by another thinner line, called a gangion. The length of the gangion and the distance between gangions is different, depending on the target fishery and vessel. To allow handling, gear is divided into smaller segments configured as magazines, rails, skates, coils, or tubs. A mechanized "autobaiter" is used to bait gear and the gear is deployed from this machine. (NMFS 2010a: 2)

Longline gear is set by dropping a buoy and anchor from one end of the groundline aft of the vessel. The rest of the gear quickly trails out as the anchor sinks. On the last segment of the set, another anchor and buoy are tied to the end of the line and deployed. After soaking, longline gear is retrieved by pulling in the groundline, so that the hooks come aboard one at a time. The line comes into the vessel over a roller, and passes through the crucifier (fish stripper), which is designed to automatically remove fish from the line. The line then is either coiled or hung onto racks by the hooks. Usually longliners set multiple strings, let them soak, and then rotate between hauling and resetting the gear. This cycle may continue for many sets per day. (NMFS 2010a: 2-3)

Processing strategies for Pacific cod aboard freezer longliners vary from vessel to vessel, but a generalized operation is shown in Figure 1. Depending on the vessel configuration, the actual factory layout and the space for each of these operations can vary as can catch handling procedures. (NMFS 2010a: 3) Most vessels in this sector undergo maintenance and repair in the summer months, although several vessels process and custom freeze salmon during this period. (Council 2007b: 104).



1-- Fish are removed from longline as they come on board by fish stripper or roller man and enter factory. 2-- Fish are bled at bleeding station. This is also generally the location where observer samples catch. 3-- Unretained catch is discarded. Catch is also discarded by the roller man at location number 1 and small amounts are discarded inside the factory at locations 6, 9 and 11. 4-- Fish enter incline belt to bleed tank. 5-- Bleed tank. 6-- Fish flow out of bleed tank into shallow pan. 7-- Observer work area. 8-- Heading machines. 9-- Fish are gutted and panned for freezing. 10-- Plate freezers. 11-- Frozen fish are glazed and bagged. 12-- Bagged fish are stored in freezer hold.

Figure 1 Generic layout of a freezer longline factory
Source: NMFS 2010a: 3.

Under IR/IU rules, with very few exceptions, no Pacific cod may be discarded. This notwithstanding, as fish enter the vessel, some fall from the hook or are deliberately removed prior to reaching the fish stripper. At the bleeding station, additional sorting takes place, undesirable catch is discarded and large species such as skates are removed for separate processing. Because the bleeder is unable to control the speed with which fish enter the vessel, it is not always possible to fully sort catch prior to the bleed tank. Nor is it possible for the bleeder to assess whether fish have parasite or sand flea damage. Thus, following bleeding, an unknown amount of catch is discarded inside the factory, either at the heading or panning stations. Finally, after freezing, final quality checks may reveal additional substandard fish that must be discarded. Because discard or fish loss can take place at numerous locations, the composition and quantity of catch changes as that catch moves through the factory. (NMFS 2010a: 4)

Observer sampling

NMFS considers everything caught on the line to be part of the catch, and the agency uses observer sample data to estimate the weight and/or number of each species caught by freezer longliners. Under the observer restructuring program, the vessels in this sector will be required to have 100 percent observer

coverage on fishing days. NMFS utilizes a robust sampling design to minimize the effects of sampling error, and observer sampling methods are based on randomized sampling designs.

Observer collected data consist of the following components. First, observers obtain an average hook count at least two times per week. An average hook count is a count of the number of hooks on an individual gear segment, and of at least one fifth of the number of segments in a regular set. For example, if a vessel regularly sets 20 segments (rails, magazines, tubs) in a set, the observer will count all the hooks on five individual segments, and this will be done at least twice per week. The number of segments of gear in an individual set is verified on a regular basis, specifically, observers compare their own observations to the vessel logbook to verify that the logbook information regarding total segments in a set is reliable. Then, observers monitor portions of the gear retrieval following a random sampling methodology. During these sample or "tally" periods, observers count everything caught by the gear. The crewmember at the roller sets aside bycatch, and PSC, as requested by the observer. These collected fish are subsequently used to determine an average weight per bycatch species and PSC species, respectively. Finally, observers obtain a weight sample from each species caught for an average weight. These weight samples are collected either during the tally period or as close to it as possible. The average weight, coupled with the count, allows the observer program to estimate the total catch of each species. (NMFS 2010a: 4; Martin, pers. comm., August 31, 2011) The samples are weighed on a motion compensated platform scale. The scale is located next to an observer station table where biological samples may be collected from the fish. (Watson, pers. comm., April 4, 2011).

Pacific cod harvests[11]

Table 4 summarizes information on retained Pacific cod harvests by the fleet over the years 2004 to 2011 (data for 2011 only covers the year through July 17). In the years for which data are complete, the number of vessels with retained Pacific cod ranged between 36 in 2010, and 39 in the years 2004 through 2006 and 2008.[12] As shown, harvests for the years with complete data range from about 84,000 metric tons in 2007 to about 113,000 in 2005. Most of the harvest was from targeted non-CDQ fishing in the BSAI, but significant proportions also came from targeted CDQ fishing in the BSAI, and targeted Pacific cod fishing in the GOA. CDQ and GOA production are discussed in more detail below. Table 5 shows estimates of average retained catches.

[11] The data used in this section were prepared by the Alaska Fisheries Information Network using information on vessels licensed for catcher/processor activity and longline gear, and with weekly or daily processor reports show retained targeted (CDQ or non-CDQ) BSAI Pacific cod catches in the relevant year. Activity in the BSAI and GOA is shown for these vessels. If a freezer longline vessel only fished for Pacific cod in the GOA, and did not target Pacific cod in the Bering Sea, it is not included in this list of vessels.

[12] This includes activity by small numbers of vessels with low levels of targeted Pacific cod production in the BSAI. Some of this production may actually represent errors in the data, and not BSAI participation by a separate vessel. Of the 296 vessel-years of activity reported in Table 4, 4 represented less than 100 metric tons of retained targeted Pacific cod production, 9 represented less than 200 metric tons, and 10 represented less than 500 metric tons.

Table 4 BSAI freezer longline Pacific cod retained harvests in metric tons, by source of harvest

Year	Number vessels	BSAI target	BSAI incidental	BSAI CDQ	GOA target.	GOA incidental	Total retained Pacific cod
Vessels and metric tons retained round weight							
2004	39	93,811	27	14,582	4,318	29	112,766
2005	39	98,595	23	13,372	934	57	112,981
2006	39	84,453	33	12,723	3,540	48	100,797
2007	37	67,917	16	11,293	4,371	77	83,673
2008	39	75,436	29	16,378	4,707	41	96,592
2009	38	83,113	6	16,702	4,386	50	104,258
2010	36	71,761	19	15,735	7,343	37	94,894
2011*	29	53,235	5	11,021	3,953	7	68,220
Year	Number vessels	BSAI target	BSAI incidental	BSAI CDQ	GOA target.	GOA incidental	Total retained Pacific cod
Percent of total retained harvest from each source							
2004		83%	0%	13%	4%	0%	100%
2005		87%	0%	12%	1%	0%	100%
2006		84%	0%	13%	4%	0%	100%
2007		81%	0%	13%	5%	0%	100%
2008		78%	0%	17%	5%	0%	100%
2009		80%	0%	16%	4%	0%	100%
2010		76%	0%	17%	8%	0%	100%
2011*		78%	0%	16%	6%	0%	100%

Notes: * reflects partial year data. Last harvest included was July 17, 2011. Includes data for freezer longliners with retained, targeted BSAI Pacific cod. "Incidental" refers to Pacific cod taken incidental to other targets. A vessel retaining incidental BSAI Pacific cod, without retaining targeted Pacific cod, would not be included; a vessel retaining GOA targeted Pacific cod, but not BSAI targeted Pacific cod would not be included.
Source: AKFIN data set of July 22 summarized by NMFS AKR[13].

Table 5 Average annual Pacific cod production in the BSAI freezer longline fleet

Year	Number vessels	Average targeted BSAI Pcod	Average CDQ Pcod	Average GOA Pcod	Average total harvest Pcod
2004	39	2,405	374	111	2,891
2005	39	2,528	343	24	2,897
2006	39	2,165	326	91	2,585
2007	37	1,836	305	118	2,261
2008	39	1,934	420	121	2,477
2009	38	2,187	440	115	2,744
2010	36	1,993	437	204	2,636
2011*	29	1,836	380	136	2,352

Notes: * reflects only part year through July 17, 2011. Includes data for freezer longliners with retained, targeted BSAI Pacific cod. Total harvest includes incidental harvests in both the BSAI and GOA. CDQ and GOA averages are for entire BSAI fleet; averages for just the vessels active in these fisheries may be found in Table 6 and Table 9.
Source: Estimates in Table 4.

[13] Many of the tables in this analysis are based on data provided by the Alaska Fisheries Information Network (AKFIN) and compiled by NMFS Alaska Region (AKR) staff. AKFIN prepared the data set using data from NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA, NMFS Alaska Fishery Science Center Observer Program sourced through NMFS AKR, data compiled by AKFIN in Comprehensive_OBS, and NMFS Alaska Region At-Sea Production Reports, data compiled by AKFIN in Comprehensive_WPR. (Fey, pers. comm., June 15, 2011)

Spatial and temporal distribution of harvest

Most freezer longline fishing activity in the Bering Sea and Aleutian Islands occurs along the continental shelf break in the Bering Sea, and especially along the area of the break to the west and north of the Pribilof Islands (Figure 2). Other activity takes place along the Aleutian Chain, although Steller sea lion protection measures, which became effective in the 2011 season, will limit activity in Area 542, and eliminate it in Area 543, in the future.[14] (75 *FR* 77535, December 13, 2010)

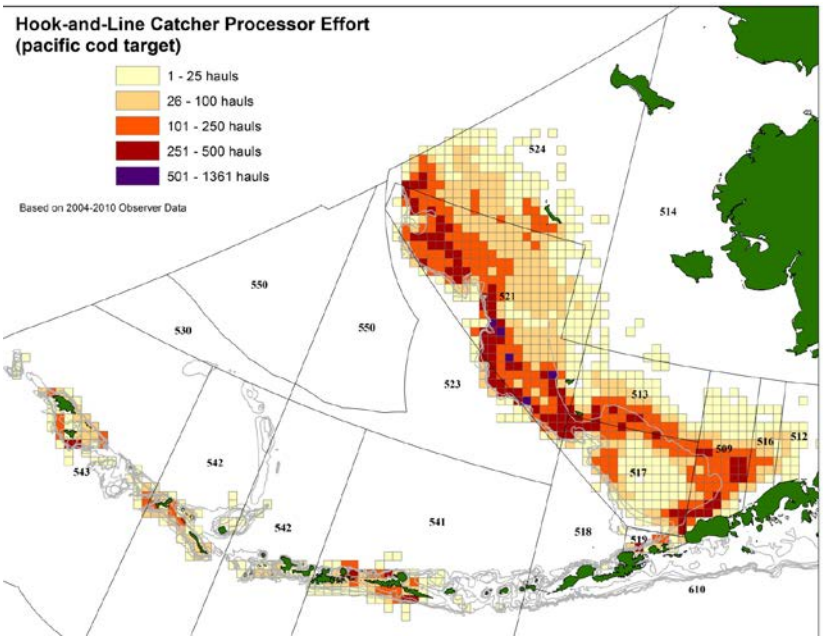


Figure 2 Locations of Freezer Longline Hauls in the Bering Sea and Aleutian Islands for the years 2004 through 2010 Source: NMFS AKR In-season management.

Prior to 2011 the BSAI non-CDQ targeted fishing was concentrated in the months from January to March, and from August to December. Fishing in the BSAI CDQ fishery tended to be concentrated in the months from February to March, and July and August, and fishing in the GOA tended to be concentrated in the months from January to March and September to October.

The FLCC began to operate its voluntary catch sharing program in the BSAI non-CDQ fishery in August, 2010. Thus, much of the fishing in 2010 took place before the effects of the program could have been felt (some impacts may have occurred from August to December 2010). Rationalization is likely to affect BSAI non-CDQ targeted fishing by slowing the rate of catch and extending the season for any given TAC and seasonal allocation. In the spring of 2011, the rate of harvest was slower than in 2010, and the "A" or first season ran until June. In addition, in 2011, the halibut PSC limit was released for the period June 10 to August 15, allowing Pacific cod fishing to take place during this time. Thus, it appears likely that the fishing season will extend to cover the entire year. CDQ and GOA fishing activity are not directly subject to the catch share arrangements within the cooperative. However, vessels in the cooperative also participate in these fisheries, and their participation in these fisheries may be affected in the future by changes in the non-CDQ targeted fishing in the BSAI.

[14] Ongoing litigation may overturn or lead to modification of the Steller sea lion protection measures. Likewise, future Council action to implement an alternative reasonable and prudent alternative (RPA) may modify the restrictions.

CDQ operations

Six CDQ groups, representing the interests of 65 Western Alaska communities, receive an allocation of 10.7 percent of the overall TAC. The allocation is divided unequally among the six groups. In 2011, these allocations ranged from a low of 8.861 percent received by Central Bering Sea Fishermen's Association, to a high of 20.938 percent received by Bristol Bay Economic Development Corporation. Five of the groups received more than 15 percent. (NMFS 2011a)

Vessel operators may lease Pacific cod CDQ from CDQ groups. In some instances, vessels owned or partially owned by CDQ groups may fish CDQ obtained as part of the joint venture. Table 6, which shows retained CDQ Pacific cod harvests for the BSAI catcher/processor longline fleet, reveals that CDQ accounted for a significant proportion of the overall harvest during the period 2004 to 2011 (the 2011 fishery is not yet complete, at this writing). CDQ accounted for a low of about 12 percent of retained harvests from all BSAI and GOA sources for this sector in 2005, and a high of about 17 percent in 2008 and 2010.

Of the 296 vessel-years with targeted Pacific cod harvests in the BSAI from 2004 through early 2011, 131 (or 44 percent) included retained harvests of CDQ quota. In 59 of these cases, the CDQ accounted for less than 25 percent of the Pacific cod harvest. However, in 72 of these 131 cases, it accounted for over 25 percent of the year's Pacific cod harvest, and in three of the 131 cases it accounted for over 50 percent. Twenty vessels retained CDQ Pacific cod over this period. Of these vessels, 17 harvested CDQ Pacific cod in six or more of the years in the 8-year period.

Table 6 CDQ activity for vessels retaining CDQ Pacific cod

Year	Number of vessels	CDQ Pcod tons for these vessels	All Pcod tons for these vessels	CDQ share (percent)
2004	19	14,582	62,164	23%
2005	17	13,372	55,765	24%
2006	18	12,723	52,260	24%
2007	17	11,293	46,850	24%
2008	17	16,378	54,227	30%
2009	17	16,702	59,116	28%
2010	15	15,735	52,011	30%
2011*	12	11,021	33,103	33%

Note: *2011 through July 17. All Pacific cod (Pcod) tons include retained targeted and incidental harvests in the BSAI and GOA, and CDQ harvests.
Source: AKFIN data from July 21, 2011 summarized by NMFS AKR

Incidental catch

The main species that are incidentally caught and retained in the BSAI Pacific cod freezer longline fishery are arrowtooth flounder, pollock, and skates (Table 7). The table only includes estimates of the most significant incidental catches.

Table 7 Retained incidental catches of the BSAI Pacific cod freezer longline fleet in the targeted Pacific cod fishery (metric tons)

Year	Arrowtooth BSAI	Pollock BSAI	Skates BSAI	Skates GOA
2004	81	4,629	4,442	164
2005	720	3,593	6,354	5
2006	502	2,602	3,879	201
2007	267	2,857	3,202	128
2008	383	4,385	4,614	98
2009	289	3,977	3,254	43
2010	274	3,387	3,390	236
2011*	29	2,397	2,091	120

Note: *2011 annual data through July 17. Only includes retained catches through June 5.
Source: AKFIN data from July 21, 2011 summarized by NMFS AKR

Other groundfish targets for this fleet

The other key groundfish species targeted by the freezer longline vessels that retain BSAI Pacific cod are sablefish and Greenland turbot (Table 8). Some of the vessels also target IFQ or CDQ halibut, however, not during their groundfish fishing activity. The halibut fishing is not managed under the BSAI or GOA FMPs. Some of these vessels may also have other fishery-related activities during the course of the year, for example, tendering or processing salmon during the summer, however NMFS does not have complete data on these activities.

Table 8 Retained targeted (non-Pacific cod) groundfish catches of the BSAI Pacific cod freezer longline fleet

Year	Sablefish BSAI	Turbot BSAI	Sablefish GOA
2004	164	1,486	1,604
2005	288	1,838	1,803
2006	275	1,586	1,437
2007	351	1,664	1,500
2008	235	1,090	1,135
2009	299	1,418	849
2010	209	2,400	646
2011*	118	511	678

Note: *2011 annual data through July 17.
Source: AKFIN data from July 21, 2011 summarized by NMFS AKR

Pacific cod fishing in the GOA

The FLCC does not currently include vessels that only target Pacific cod in the GOA and its program of quota management does not extend to harvests in the GOA. As previously explained, neither does its program of quota management extend to the portion of Pacific cod target harvests made in the GOA by operations fishing Pacific cod in both the BSAI and GOA. The management alternatives under consideration in this action will apply to these latter vessels, whether they are fishing in the BSAI or the GOA.

For that portion of the fleet fishing in both areas, Table 4 provides estimates of the percentage of total retained Pacific cod harvests originating in targeted harvests from the GOA for the eight years from 2004 through 2011 (2011 data are incomplete). These percentages ranged from one percent in 2005 to 8 percent in 2010. The median annual percentage is 5 percent.

However, the vessels that operated in both areas are significantly more dependent on production from the GOA than the average vessel in the fleet. Table 9 shows that the number of BSAI vessels that also participated in the GOA Pacific cod fishery ranged from 6 in 2005, up to 16 in 2008 and 2010. The percent of production from this source for these vessels ranged from 6 percent in 2005 (when the average for the whole fleet was 1 percent, see Table 4), up to 19 percent in 2010 (the most recent year for which complete annual information is available).

Table 9 GOA activity for vessels targeting GOA Pacific cod

Year	Number of vessels	GOA Pcod tons for these vessels	All Pcod tons for these vessels	GOA share (percent)
2004	11	4,318	31,775	14%
2005	6	934	15,031	6%
2006	15	3,540	39,222	9%
2007	13	4,371	32,888	13%
2008	16	4,707	40,693	12%
2009	15	4,386	40,636	11%
2010	16	7,343	38,601	19%
2011*	8	3,953	17,507	23%

Note: *2011 annual through July 17 All Pacific cod (Pcod) tons includes targeted and incidental harvests in the BSAI and GOA, and CDQ harvests.
Source: AKFIN data from July 21, 2011 summarized by NMFS AKR.

Time spent fishing

In the absence of survey information, NMFS can make inferences about time spent fishing from weekly processor reports, reports on days of observer deployment, and vessel monitoring system records of vessel movements. In this analysis, activity estimates have been made using data on the number of observed fishing days. This was done because the primary reason for evaluating fishing time in this analysis is to project potential costs of increased observer coverage under Alternatives 3 or 4.

Alternative 3 requires a second observer whenever the vessel is fishing for groundfish (not just for Pacific cod) when fishing for Pacific cod is open. Thus, the discussion on number of fishing days in this section focuses on the number of groundfish fishing days rather than the number of Pacific cod fishing days.

As noted in Section 1.1.4, from 2004 through 2011, observer coverage requirements varied across catcher/processors, depending on vessel length, and on whether or not they harvested CDQ. Vessels under 60 feet LOA were not required to carry observers, vessels from 60 feet to 125 feet LOA were required to carry vessels on 30 percent of their fishing days, and vessels 125 feet LOA and larger were required to carry observers on 100 percent of their fishing days. Vessels fishing with CDQ have generally been required to have two observers on each fishing day.

As a result of these rules, the data on the number of observed days a vessel 125 feet LOA and longer has been longlining for Pacific cod provides an accurate count of the number of days fishing. No data would be available from this source for vessels under 60 feet LOA (unless they had fished CDQ Pacific cod). Partial data are available for vessels between 60 feet and 125 feet LOA. Of the 296 vessel-year observations available for the period 2004 through 2011, five were for vessels with no observer coverage, 90 for vessels with 30 percent observer coverage, and 201 for vessels with 100 percent observer coverage.[15]

[15] Based on data supplied by AKFIN on July 21, 2011, and evaluated by NMFS AKR staff. One annual observation for one 30 percent vessel did not include estimates of observer days.

Thus, for a very small number of observations, there is no information from this source. For about two-thirds of the observations there is good information on the total number of fishing days. For about one-third of the observations, we have limited information on the number of fishing days. One approach to estimating total fishing days for the 30 percent vessels would be to extrapolate from the number of actual daily observations, assuming that 30 percent of the fishing days were observed, and estimate the total number of fishing days from this. However, this results in numbers that are implausibly high; they are high with respect to corresponding numbers from the 100 percent observed vessels, and they are high with respect to the length of the calendar year (many exceed 365 days).

There are several reasons for this. First, some of these vessels fish for Pacific cod CDQ or other CDQ, and would be required to carry observers on 100 percent of their CDQ fishing days, as well as 30 percent of their non-CDQ fishing days. Thus, their total days with observer coverage would exceed 30 percent.

Moreover, freezer longline vessels often carry observers on days when such coverage is not required by regulation. In the GOA, freezer longline operations between 60 feet and 125 feet LOA voluntarily carry observers on 100 percent of their fishing days when participating in the Pacific cod directed fishery. The reason is that observer information is used to monitor halibut PSC use by the fleet in the GOA, so as to prevent the fleet from shutting down all longlining prematurely. In the BSAI, freezer longliners between 60 feet and 125 feet will often carry observers on more days than are required, because the vessels are taking long trips, at a distance from port, and the cost of carrying the observer for extra days is less than the cost of fuel and lost fishing time, incurred while traveling to and from port to transfer observers. The situation is exacerbated by the requirement to carry an observer on 30 percent of fishing days during each fishing quarter. Some skippers indicate that actual BSAI observer coverage may reach 50 percent to 70 percent for these reasons. (Down, pers. comm., July 28, 2011)

Table 10 provides information on the number of days in which observers reported retained Pacific cod catches by vessels in the freezer longline fleet. This covers all days with observed groundfish harvest, not just the days with observed Pacific cod harvest. Data are provided separately for the 30 percent and the 100 percent coverage vessels. The estimates of the days for the 30 percent vessels almost certainly exceed 30 percent of actual fishing days for the reasons discussed above. A column in the table shows the length of the Pacific cod fishing season. This is not directly comparable to the number of days fishing, because the latter include days with other groundfish targets.

Table 10 Days of observed groundfish fishing by the freezer longline Pacific cod sector in the BSAI and GOA

Year	Number vessels	Total observed days for 30 percent coverage vessels	Average observed days for 30 percent coverage vessels	Total observed days for 100 percent coverage vessels	Average observed days for 100 percent coverage vessels	Length of the Pacific cod fishing season in days
2004	39	1,234	123	5,248	187	183
2005	39	1,240	124	5,127	183	171
2006	39	1,221	111	3,801	136	186
2007	37	1,090	91	2,857	114	180
2008	39	1,350	113	3,461	138	122
2009	38	1,358	113	3,544	142	129
2010	36	1,200	100	3,371	147	177
2011*	29	661	66	1,962	103	197

Note: *2011 annual through July 17.
Source: AKFIN data from July 21, 2011, summarized by NMFS AKR; fishing days per year estimated from information on opening and closing dates for seasons. 2011 data includes all days through July 18.

Markets[16]

The most important Pacific cod products produced by this fleet are frozen eastern and western cut headed-and-gutted (H&G) Pacific cod. Over the years 2008 through 2010, eastern cut accounted for between 63 percent and 83 percent of H&G production, and western cut accounted for between 17 percent and 37 percent. Over these years, both together accounted for over 95 percent of total output weight. Other products included whole or bled Pacific cod, and ancillary products such as roe, pectoral girdles, heads, cheeks, chins, belly flaps, milt, stomachs, and other products. (NMFS AKR, production reports)

Pacific cod produced by the freezer longliners is ultimately consumed in a wide variety of places (white tablecloth restaurants, fast food restaurants, food service operations in schools and hospitals, grocery stores, in the United States or in foreign countries) and in a wide variety of product forms (fillets, sticks, portions, breaded or unbreaded, and salt cod, in addition to the ancillary products listed above).

As described at the start of this section, the BSAI freezer longliner vessels are primarily producing trays of frozen H&G Pacific cod. This product is processed further once it leaves the catcher/processor. Additional processing may take place in the United States. However, much of the processing takes place overseas, as well. Pacific cod processed in second countries may be exported to third countries for consumption. For example, large Pacific cod produced from the Aleutian Islands may be shipped to Norway for further processing, and then shipped to Brazil for final processing and consumption as salt cod. Pacific cod receiving secondary processing overseas may be re-exported, to the United States, for consumption. (Northern Economics 2010: 150).

Other whitefish, including saltwater species such as Atlantic cod, hake, Alaska pollock, hoki, Atlantic pollock, and fresh water species such as Nile perch and tilapia, are substitutes for Pacific cod. Aquaculture firms in Norway, Scotland, and Canada are beginning to produce farmed cod. In Norway, for example, farmed cod production increased from 3,000 metric tons in 2004, to 15,000 in 2007. Declines in production of Atlantic cod, and greater acceptance of Pacific cod as a substitute, have contributed to higher prices for Pacific cod in recent years. Industry efforts to distinguish Pacific cod from

[16] A more detailed discussion of Pacific cod markets may be found in the report by Northern Economics.

other whitefish, and thus reduce the potential for substitution between them, include sustainability certification by the Marine Stewardship Council, and use of the name "Alaska cod" in marketing. (Northern Economics 2010:154-156) The Aleutian Islands produce large Pacific cod that are relatively unique in the market place. (Magnuson, pers. comm., September 16, 2010)

Data distributed by the consulting firm Northern Economics indicates that freezer longline Pacific cod tends to bring a higher price than Pacific cod harvested by trawl vessels.

> According to an industry representative, this price difference occurs because fish caught by longline gear can be bled while still alive, which results in a better color fish, and there is less skin damage and scale loss than if they are caught in nets." Moreover shoreside processors also tend to receive a lower price: "Two factors may contribute to the lower prices received by these processors for H&G Pacific cod: 1) the fish have been dead for many hours before they are processed (although they are generally kept in refrigerated saltwater holds; and 2) the fish delivered are from near-shore fishing grounds, and these fish tend to be more infected with parasitic nematodes ('codworms'). Labor intensive 'candling' of fillets for these and other parasites can account for approximately half of the production cost for Pacific cod from the BSAI and GOA. (Northern Economics 2010: 150, citing Bublitz and Choudhury 1992)

The available evidence indicates that Pacific cod prices were rising in the early 2000s, but that they peaked in 2008, and then collapsed in 2009. This would be consistent with the large decline in world trade following the financial crisis that occurred in September 2008. (see the price pattern in Hiatt et al. 2010: 65)

Revenues from fishing for Pacific cod

Table 11 shows estimates of nominal average, median, 25th percentile and 75th percentile gross revenues from freezer longliners fishing for Pacific cod from 2004 to 2009.[17] Figure 3 shows the mean, median, and 25th and 75th percentiles of estimated Pacific cod gross revenues for the vessels active in the BSAI freezer longline Pacific cod fishery from 2004 through 2009. Revenues include non-CDQ and CDQ, targeted and incidental, and BSAI and GOA Pacific cod revenues. Revenues have been converted to constant 2010 dollars to factor out the impact of inflation. Median and 25th percentile revenues rose from 2004 through 2005 and then appeared to remain relative stable until they dropped in 2009. The 75th percentile and, to a lesser extent, mean revenues appear to have risen over the entire period, until they dropped in 2009 as well.

[17] Revenues prior to 2004 are less reliable due to differences in the treatment of CDQ harvests. Revenue estimates for 2010 and 2011 are not yet available.

Table 11 Nominal gross revenues from BSAI Pacific cod for the BSAI freezer longline fleet

Nominal dollars					
year	Number vessels	Mean revenues	25th percentile revenues	Median revenues	75th percentile revenues
2004	39	4,006,034	2,971,296	3,953,326	4,891,963
2005	39	4,845,300	3,598,740	4,763,962	5,317,366
2006	39	5,551,425	3,786,009	5,117,406	6,545,946
2007	37	5,662,278	3,958,537	4,656,793	7,177,941
2008	39	6,258,223	3,723,166	5,298,018	8,721,451
2009	38	4,260,433	3,005,830	3,814,570	5,781,316
2010	36	5,027,225	2,726,720	4,100,440	6,596,485
Source: AKFIN data evaluated by NMFS AKR.					

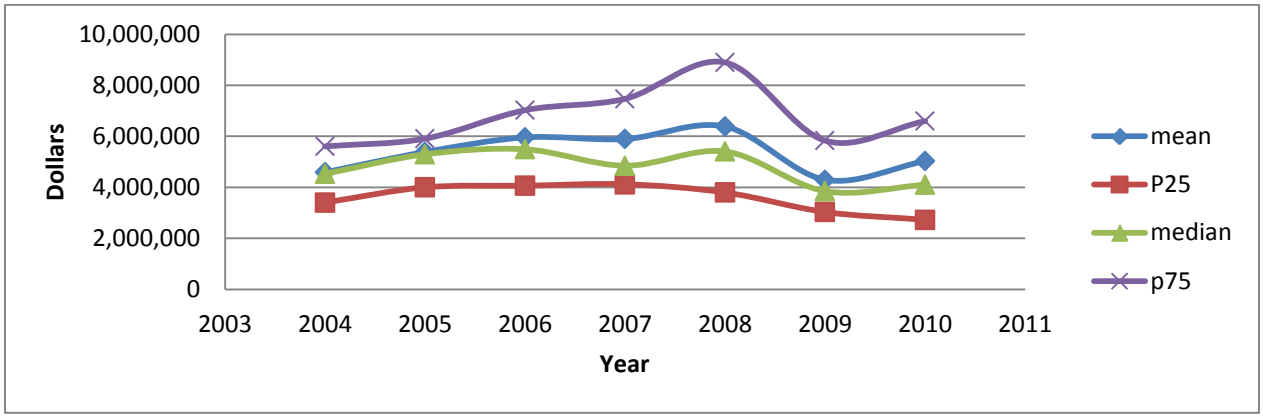


Figure 3 Real (2010 dollars) revenue distribution for BSAI freezer longline vessels
Source: AKFIN data evaluated by NMFS AKR. Notes: converted from nominal to real dollars using the implicit GDP price deflator for the second quarter of each year.

Employment

Northern Economics provided estimates of average crew sizes for freezer longliners operating in the BSAI. Average crew sizes for the freezer longliners averaged 19 persons over the period 1992 through 2000 (the annual estimated averages, based on weekly production reports, varied between 17 and 20 from 1992 through 2000). (Northern Economics 2001: 35) The numbers of longline catcher/processors fishing for Pacific cod in the BSAI ranged between 36 and 39 in the period from 2004 to 2010 (Table 4). Taking account of the variation in crew sizes, and the variation in the number of vessels per year, there may have been 612 to 780 longline positions in any given year. Numbers of persons who found employment in this sector would have been even greater, because there is turnover in crew during the year. In addition to these crew numbers, there would have been additional employment in a fishing firm's corporate office (providing overall management and strategic direction, marketing, accounting, human resources, and legal services) (NMFS 2010c: 10-23 to 10-24).

In addition to these estimates of employment in the directly regulated firms, firms buy goods and services from other firms, creating indirect employment; people earning incomes from fishing firm operations, and in the operations of their suppliers, spend these on non-fishing goods and services, generating induced employment as well. These effects reflect changes in economic activity, not benefits or costs. This is so, because an increase in activity, say, more employment in one region, is offset by equivalent declines in

employment in others. These changes are "transfers" from one region to another, and should be understood as reflecting a "zero sum" redistribution of economic activity between these respective economies.

1.2.2 History of BSAI freezer longline regulation

BSAI Sector allocations

The BSAI Pacific cod resource is targeted by multiple gear types (trawls, longlines, jig, and pot) and processing models (catcher/processors and catcher vessels delivering to mothership and shoreside processing). The entire TAC is currently allocated among different fishing industry sectors, defined by CDQ status, gear type, vessel size, and ability to process Pacific cod on board the vessel. The 2011 acceptable biological catch (ABC) is 235,000 metric tons and the 2011 TAC is 227,950 metric tons.[18] Excluding the 10.7 percent allocated to the CDQ Program reserve, the 2011 non-CDQ TAC (or ITAC) was 203,559 metric tons. (76 *FR* 11143, 11147; March 1, 2011)

Currently, Federal regulations at 50 CFR 679.20(a)(7) authorize distinct BSAI Pacific cod allocations of the ITAC[19] among the following sectors: (a) vessels using jig gear, (b) trawl catcher/processors, (c) trawl catcher vessels, (d) longline catcher/processors, (e) longline catcher vessels, (f) pot catcher/processors, (g) pot catcher vessels, and (h) longline and pot vessels less than 60 feet length overall. (Council 2007b: 2, 8) The BSAI groundfish FMP and regulations currently require (and have required since 2000) an allocation of 80 percent of the 51 percent of the ITAC allocated to fixed gear to the longline catcher/processors. (Council 2007b: 5) The BSAI Pacific cod TAC has been apportioned among gear sectors since 1994, and the CDQ Program has received a BSAI Pacific cod allocation since 1998. The existing allocations to the trawl, fixed, and jig gear sectors have been in place since 1997; a further split among the fixed gear sectors has been in place since September 2000.

Since the BSAI Pacific cod allocations have been in effect, NMFS has reallocated quota each year from the trawl and jig sectors to the pot and longline sectors. Reallocations between sectors using the same gear (e.g., trawl catcher/processor to trawl catcher vessel, or longline catcher vessel to longline catcher/processor) have occurred less frequently and in lower amounts. In terms of metric tons, the majority of reallocations have been from the trawl sectors (catcher vessels and catcher/processors). With the exception of the jig sector, because any unused *seasonal apportionment* to a particular sector is reallocated to the next seasonal allowance for that sector, reallocations from one gear sector to another occur in the last season. Typically, reallocations from trawl to the fixed gear sectors occur in October and November, and always during the trawl C season (June 10 through November 1). (Council 2007b: 7)

License limitation

The License Limitation Program (LLP) became effective on January 1, 2000. (Council 2007b: 4-5) This groundfish LLP program was implemented pursuant to BSAI Amendment 39 and GOA Amendment 41, adopted by the Council in 1995. This program provided for separate endorsements for the AI, BS, Western GOA, Central GOA, and Southeast Outside. The program provided for a catcher vessel or

[18] In 2006, the Alaska Board of Fisheries took action to establish a state waters Pacific cod fishery in the Aleutian Islands, west of 170° W longitude. This fishery has a guideline harvest level (GHL) equal to 3 percent of the BSAI Pacific cod ABC. The 2011 TAC, which is 3 percent less than the 2011 ABC, accounts for this State GHL. (Council 2007, 3)

[19] ITAC is equal to the TAC minus the 10.7 percent CDQ allocation. Note also that a 3 percent deduction from ABC is made before calculation of the TAC to accommodate the State Aleutian Islands Pacific cod GHL of 3 percent of the ABC.

catcher/processor endorsement. LLP licenses specified a maximum length overall (MLOA) for licensed vessels. The MLOA for a license was based on length determinations specified in the preceding moratorium program for vessels initially receiving licenses. Thereafter the MLOA for a license was fixed. (63 FR 52642–52644; October 1, 1998)

BSAI Amendment 67, approved by the Council in April 2000, introduced a Pacific cod endorsement for BSAI LLP licenses. Amendment 67 required that fixed gear vessels ≥60' participating in the BSAI Pacific cod fishery must qualify for a Pacific cod endorsement, which would be part of the participant's LLP license. Eligibility for a cod endorsement was based on past participation in the BSAI fixed gear fisheries during specific combinations of the years 1995 through 1999. Four different endorsements are available, depending on the gear used to harvest cod (longline or pot) and whether the cod was processed onboard the harvesting vessel (catcher vessel or catcher/processor). Amendment 67 exempts catcher vessels <60' LOA from the requirement to have a cod endorsement to participate in the directed BSAI fixed gear Pacific cod fisheries. Amendment 67 effectively granted exclusive access privileges to longtime participants in the BSAI fixed gear cod fishery and, thus, reduced the number of allowable participants. This amendment became effective January 1, 2003. (Council 2007b: 6)

Capacity reduction programs

By 2003, a freezer longline Pacific cod allocation for the BSAI had been created, and the list of vessels that could participate in the fishery in the Aleutian Islands, and in the Bering Sea had been defined. These factors would have reduced the costs and increased the benefits of collective action by fishing operations to reduce fishing capacity through a buy-back program. The defined group of potential beneficiaries would have reduced the costs of organizing. The sector allocation and limitation of entry would have reduced the potential for members of other gear groups and sectors to free ride on a reduction in freezer longliner capacity. In 2005, section 291(e) of the Consolidated Appropriations Act of 2005, established the BSAI non-pollock groundfish longline catcher/processor subsector fishing capacity reduction program. A final rule creating the institutional structure to implement a buyback program was published (71 *FR* 57696) on September 29, 2006. (72 *FR* 20836, April 26, 2007)

In the spring of 2007, the sector voted to take out a loan from NMFS for $35 million, to buyback four groundfish LLP licenses endorsed for the freezer longline fishery. The FLCC conducted the offer and selection process, submitted the reduction plan, and solicited and accepted the offers to sell. The members of the sector committed themselves to paying off the $35 million federal loan for the purchases over 30 years. The revenues from the loan were used to purchase four licenses. One was inactive and purchased for $1.5 million; three were associated with active vessels, which were to be withdrawn from the fishery, and were purchased at prices between $10 million and $11.8 million. The F/V *Northern Aurora*, F/V *Horizon*, and F/V *Western Queen* were withdrawn from the fishery. (NMFS 2007b: 2; 72 FR 20836, April 26, 2007)

The Freezer Longline Conservation Cooperative

Since 2006, most of the persons holding LLP licenses endorsed for freezer longliner have been members of the FLCC. In June 2010, the remaining LLP license holders joined the cooperative, so that with the start of the 2010 "B" season on August 15, all holders of LLP licenses authorizing the use of these vessels were members of the cooperative. (Down, personal communications; NMFS AKR in-season management) The FLCC incorporated in the State of Washington in February, 2004, for the purpose of the buyback program. It was not initially a harvest cooperative. (Council 2007b: 153)

However, the FLCC has now, reportedly, transformed itself into a harvest cooperative, creating an individual quota program within the sector. Each year FLCC members each receive a share of the sectoral

allocation; shares are issued in proportion to historical fishing activity with the LLP license. FLCC members are free to exchange their quota shares among themselves, and to stack shares on individual vessels. The program is implemented as a private contract among cooperative members. Compliance with the program is monitored by SeaState, Inc., and the contract signed by the members imposed heavy financial penalties for non-compliance. (Down, personal communications; NMFS AKR in-season management)

In the past, even without 100 percent membership, the cooperative has been able to organize GOA harvests, so as to make reliable commitments that members would reach halibut PSC avoidance goals.[20] NMFS has relied on these commitments to open fisheries that would not otherwise have been opened. (Down, pers. comm., August 23, 2010).

A harvest cooperative running an individual quota program, such as the FLCC, creates the conditions for significant reorganization of fishing activity. Individual operations now have effectively guaranteed harvest quotas each year, and they have the opportunity to fish these in the way that they find most profitable. While it is difficult to project exactly how this will play out, given the technology used in the freezer longline Pacific cod sector, reductions in the number of active vessels, reductions in the speed of harvest, improvements in product quality, or a lengthening of the fishing season, appear likely. Harvest rates declined, the season lengthened, and fewer vessels were actively participating, when the 2011 "A" season is compared to the 2010 "A" season. Sectoral profits are likely to increase, and the fleet may be able to redeploy some fishing effort from the rationalized Pacific cod fishery, into other targets, such as sablefish and Greenland turbot, all else equal. The vessels and techniques that were best adapted for a competitive fishery may not be the vessels best adapted for a rationalized fishery, which may lead to a replacement of segments of the fleet.

SSL measures restrict AI fishery

In December 2010, NMFS issued an interim final rule to implement Steller sea lion protection measures to insure that the BSAI groundfish fisheries off Alaska were not likely to jeopardize the continued existence of the western distinct population segment (DPS) of Steller sea lions, nor destroy or adversely modify Steller sea lion designated critical habitat. These management measures were designed to disperse fishing effort over time and area to provide protection from potential competition for important Steller sea lion prey species in waters adjacent to rookeries and important haulouts in the BSAI. The intended effect of the interim final rule was to protect the endangered western DPS of Steller sea lions, as required under the Endangered Species Act (ESA), and to conserve and manage the groundfish resources in the BSAI, in accordance with the Magnuson-Stevens Fishery Conservation and Management Act. (75 *FR* 77535, December 13, 2010)

This rule restricted freezer longline fishing for Pacific cod in the Aleutian Islands. Retention of Pacific cod in Area 543 (the far western Aleutians) was prohibited. More complex, but less restrictive, regulations were adopted in Areas 541 and 542. Details of these may be found in Section 2.1.4 of the EA/RIR for this action (NMFS 2010c)

The analysis of these restrictions estimated that, had they been in effect during the years 2004 to 2009, they would have reduced this fleet's median annual Aleutian Island harvests by about 58 percent.[21] It was hypothesized that this fleet would be able to make up much of its loss by shifting its fishing effort to other

[20] There is a longer discussion of this effort at the end of this section in the discussion of the GOA sector split under GOA groundfish Fishery Management Plan Amendment 83.

[21] The median residual harvest for these years was estimated to be 42 percent; this implies a 58 percent reduction. (NMFS 2010d: 10-73)

areas of the BSAI. (NMFS 2010c:10-74). Nevertheless, the fleet was expected to incur financial losses, because it would lose access to stocks of large, high valued, Pacific cod in the Aleutian Islands. (NMFS 2010d: 10-76).

Potential AI-BS Pacific cod split

The Pacific cod ABC and TAC in the BSAI are defined for the entire BSAI; that is, there are no sub-regional subdivisions of the ABC or TAC within the BSAI. The BSAI wide TAC is subdivided into nine separate industry sector allocations, in addition to the CDQ Program allocation. (Council 2011b: 5)

Over the past five years, the Council has discussed whether to split the existing BSAI Pacific cod ABC/TAC into two ABC/TAC allocations, one for the BS and another for the AI. More recent biological data suggest that apportioning the BSAI Pacific cod stock may better reflect stock biomass dynamics. Recent stock surveys suggest that a smaller portion of the BSAI Pacific cod biomass is now present in the AI than has been believed historically. Apportioning the BSAI Pacific cod stock into two separate ABC/TACs could better align the distribution of harvests with biomass distribution.

In February 2011, the Council reviewed a discussion paper on the management implications of establishing separate Pacific cod sector allocations in the BSAI areas, if the BSAI ABC and TAC were split into separate areas in the future. Upon review, the Council approved initiating a formal analysis for review. The analysis will evaluate the impacts of two alternatives. Alternative 1 is the no action alternative. Should an ABC/TAC split occur, Alternative 2 would maintain each sector's BSAI Pacific cod allocation and sectors would not receive separate allocations in the BS and AI. Each sector could fish in the BS and/or AI, as long as TAC was available and the area was open to directed Pacific cod fishing. (Council 2011b: 5)

The Council noted that it did not intend to force a conservation decision on this issue at a particular time, but that the intent was to have a clear default position, should a TAC split be determined necessary in the future. Alternative 2 appears to allow the greatest flexibility to each sector to determine where and when to fish, relative to the other alternatives. It was noted that this flexibility will be necessary should the Council undertake the development of new Steller sea lion protection measures to replace the existing measures. The Council's decision was influenced by the scientific and statistical committee (SSC) review, which recommended that the Pacific cod stock assessment author and Plan Team develop a plan of action to determine how the BSAI Pacific cod assessment should evolve, and that there did not appear to be a pressing conservation need relative to the AI Pacific cod population at this time. (Council 2011b: 5) Council staff are preparing a draft discussion paper for the October 2011 Council meeting. (Kimball, pers. comm., August 2, 2011

Relaxation of certain vessel replacement rules

In February 2011, the Freezer Longline Coalition approached the Council with a request for a discussion paper on a proposal to allow owners of certain smaller Pacific cod freezer longline vessels to rebuild or replace existing vessels with somewhat longer ones. This would require modification of existing rules governing maximum length overall conditions on LLP licenses. According to the request, the proposal would improve vessel safety, meet international class and loadline requirements that would allow a broader range of onboard processing options, or otherwise improve the economic efficiency of vessels. (Freezer Longline Coalition 2011).

In December 2011, the Council reviewed an initial review draft of the analysis, revised the problem statement, modified the set of alternatives, requested modifications to the analysis, and scheduled final action for April 2012. (Council 2011: 2)

GOA Pacific cod sector split

At its December 2009 meeting, the Council took final action on GOA Amendment 83, which allocates the Western and Central GOA Pacific cod TACs among various gear and operational sectors. Sector allocations limit the amount of Western and Central GOA Pacific cod that each sector is authorized to harvest. The action is meant to reduce competition among sectors and would support stability in the Pacific cod fishery. The action also limits access to the federal Pacific cod fisheries prosecuted in state waters, so as to promote community participation and provide incentives for new entrants in the jig sector. NMFS published a notice of availability on June 28, 2011 (76 *FR* 37763), and a proposed rule on July 26 (76 *FR* 44700, July 26, 2011). NMFS expects that this action will be effective for the 2012 calendar year. (Kelly, pers. comm., July 11, 2011) This action places all freezer longliners, of all sizes, in a single sector, and conversely, protects that sector allocation from harvest by other gear groups, starting in 2012. (FLC 2011: 2)

Long term allocations of the Western and Central GOA Pacific cod TACs to the freezer longline sector, and provisions that limit entry to the directed GOA longline Pacific cod fishery, may provide opportunities for the formation of harvest cooperatives. A cooperative may be more likely to form, once all eligible participants are easily identified through a restrictive license limitation program, and a separate allocation is made to the sector. Pacific cod endorsements on fixed gear licenses would limit entry to the directed Pacific cod fisheries in federal waters, but would not restrict vessels without LLP licenses, or without Pacific cod endorsements on licenses, from participating in the directed Pacific cod fisheries in the parallel waters fisheries. NMFS does not currently have a mechanism to allocate catch history to cooperatives in the GOA Pacific cod fisheries. A cooperative could form through voluntary action by LLP holders, through Congressional action, or through Council action, with the approval of the Secretary of Commerce. (NMFS 2011; 142)

In the GOA Pacific cod fisheries, the freezer longline sector may be the sector that is most likely to form a harvest cooperative. Traditionally, most of the freezer longliner fleet fishes for Pacific cod in the BSAI, then moves into the GOA, after the BSAI Pacific cod season closes. In 2005, the BSAI freezer longliner fleet voluntarily agreed not to fish in the GOA during the B season, because NMFS inseason management was concerned that there was not sufficient halibut PSC allowance remaining to support this fleet. As a result, during 2006 through 2009, the freezer longliners set up an informal "PSC co-op" with NMFS inseason management. Under this arrangement, the halibut PSC allowance was informally divided between catcher/processors and catcher vessels. The freezer longliners then further divided the catcher/processor PSC limit among vessels. This informal cooperation in sharing PSC limits suggests that this sector has the potential to establish a formal harvest cooperative. (NMFS 2007: 142)

The freezer longliner fleet is relatively small, and the Council's fixed gear recency action limits the number of participants in this sector by adding gear-specific Pacific cod endorsements to fixed gear licenses. An estimated 12 Central GOA licenses and 16 Western GOA licenses qualify for a longline catcher/processor endorsement. In addition, an estimated 12 Central GOA and 3 Western GOA licenses qualify for an offshore-limited longline catcher/processor endorsement, because these licenses qualified under an exemption for participants in the informal halibut PSC allowance co-op. If Pacific cod sector allocations are established, total catch by longline catcher/processors would be capped by the allocations. If vessels in this sector form a harvest cooperative subsequent to the implementation of sector allocations, this sector could potentially take advantage of increased production efficiencies of fishing cooperatively, but would not be able to increase the sector's overall harvest of the Western and Central GOA Pacific cod TACs. However, if vessels fish the catcher/processor allocations cooperatively, some vessels in this fleet could opportunistically act as catcher vessels and fish off the longline catcher vessel allocations. This would be fully consistent with the present management design in this fishery, described earlier in this document (i.e., qualified catcher/processors operating in a catcher vessel mode). Again, if the Council

perceives this to be a potential problem, there are options under Component 2 to address this issue by precluding catcher/processors that have not previously operated as catcher vessels from opportunistically operating as catcher vessels, and thereby eroding the catcher vessel allocation, while allowing vessel operators who hold catcher/processor licenses, and have historically participated as catcher vessels, to elect to operate as catcher vessels. (NMFS 2007: 142)

Changes to monitoring and enforcement requirements

Existing monitoring and enforcement requirements in the freezer longline fleet will be modified by two upcoming actions. These changes will take place whether or not the action discussed in this analysis is implemented.

NMFS currently expects that the observer restructuring program recommended by the Council will be in place at the start of 2013. In addition, NMFS has published a proposed rule revising regulations associated with recordkeeping, vessel licensing, catch retention requirements, and fisheries observer requirements to ensure that they are no more restrictive than the regulations in effect for comparable non-CDQ fisheries managed under individual fishing quotas or cooperative allocations. (75 FR 39892, July 13, 2010) NMFS currently expects to publish this final rule in the summer of 2011. (Davis, pers. comm., June 7, 2011)

Since both of these actions will help define the no action alternative for this action, they were discussed in the section 1.1.4 which described the alternatives.

Longline Catcher/processor Subsector Single Fishery Cooperative Act

In 2010, Congress passed and the President signed the "Longline Catcher/processor Subsector Single Fishery Cooperative Act." This legislation requires the Secretary of Commerce to approve a single fishery cooperative for the longline catcher/processor subsector in the BSAI no more than two years after the receipt of a request from 80 percent of the licenses issued for that subsector. The legislation authorizes the cooperative to harvest an allocation made to it, provide for a subsector "non-cooperative limited access fishery," provides for an allocation between cooperative and non-cooperative fisheries, and authorizes measures to control a shift by the rationalized fleet into GOA fisheries. (U.S. 2010). The sector has established a private cooperative arrangement, and has not taken steps to implement the provisions of this statute.

1.3 Economic impacts

The sub-sections in this section analyze the costs of Alternatives 2, 3, and 4. Alternative 1 is the no action alternative, and is the baseline for the following discussions. An additional sub-section analyzes the implications of the lead level 2 requirement.

Costs for an individual vessel

The scales alternative, Alternative 2, requires a motion compensated scale in the catcher/processor factory line, video cameras, recording equipment, and monitors to track the flow of Pacific cod, an observer sampling station (including a platform scale), an upgrade in observer requirements, and the use of an electronic logbook. Some vessels may already comply with these measures, for example, freezer longliners that have fished for CDQ Pacific cod may already have observer sampling stations to comply with the CDQ regulations.

Any physical installation will involve engineering design work, the purchase of scales, video equipment, and materials for construction, and the actual costs of installation and of modifications necessary to provide room for the observer station and the motion compensated scales in the factory. Firms will also incur ongoing annual costs for scale maintenance and inspections, and enhanced observer coverage.

As described in Section 1.2.1, the freezer longliners directly regulated by this action differ in their physical characteristics and in their business models. Vessels, for example, ranged between 58 feet LOA and 196 feet LOA in the years 2004 through 2011 (through July 17). The size of Pacific cod catch and processing capacity differed. Some vessels fished in the Aleutian Islands, and others did not; some fished for CDQ and others did not; some fished in the GOA and others did not. Vessels also had different alternative targets in the BSAI. The differences among these vessels means that the costs of this action will differ among them in ways that cannot be determined without considerable information about individual vessel characteristics and engineering analyses of factory modifications. It is not practicable to gather this information for this analysis.

The approach taken here is to identify the key cost categories and gather estimates of their likely size from informed parties. Upper and lower bound estimates are used where these are available and are combined with point estimates of other costs to produce estimates of upper and lower thresholds to total vessel costs. Because the ranges are typically attached to larger cost items, and because a liberal approach to estimating ranges was generally used, these ranges are very likely to bound almost all observations. Unfortunately, the information that would make it possible to define "very likely" with a specific probability is not available. In some instances, for example, the cost of a motion-compensated scale, NMFS believes the cost estimate is relatively precise; in others, for example, the cost of installation, the range of possible costs is quite wide and relatively imprecise. It has not been possible to estimate the size of one potentially important impact category: the changes in operational efficiency associated with the installation of scales, sampling stations, video monitoring gear, or accommodations for an additional observer.[22]

1.3.1 Alternative 2: Scales alternative

Cost of motion-compensated flow scale

Two types of motion compensated scales for weighing large volumes of catch are currently approved by NMFS. Flow scales continuously weigh fish as they move across the weighing platform on a belt; hopper scales weigh fish as they fill a container of known weight. Based on communication with informed parties, this analysis assumes that those vessels choosing to use scales, will choose flow scales because of concerns with respect to possible product quality issues, and with respect to the smooth flow of fish along the processing line. (Sources: Johannesson, pers. comm., June 16, 2011; Down, pers. comm., July 7, 2011)

The motion compensated flow scale (Figure 4) may be incorporated in the processing line, in most cases on the freezer longliner's factory deck, and may be placed before or after the bleed tank (See Figure 1 for a schematic diagram of a typical freezer longline processing line).[23]

[22] These may be positive or negative. Scales or observers can interfere with vessel efficiency or, by reducing uncertainty and providing more rapid information on harvest, may allow skippers more flexibility to fully harvest their quota shares. This is discussed later in this section.

[23] NMFS proposes to apply standard product recovery rates (PRRs) to measured weights to determine the original "live" weight of the fish. Since fish are bleeding and losing weight as they move through the processing line, the PRR will depend on the point in the processing line where the flow scale measures the fish weight. NMFS is proposing to use a PRR of 1.0 if the Pacific cod are not bled, a PRR of 0.99 if the scales are placed before the

Figure 4 Marel motion compensated flow scale
Source: Courtesy Marel Corporation.[24]

Only flow scales approved by NMFS may be used to meet the requirements of this action. Nine flow scales have been approved for weighing total catch. All of these scales are made by one firm, or by subsidiaries of this firm.[25] (NMFS no date; Watson, pers. comm., August 18, 2011)

The cost of the scale itself is currently estimated to range between $61,000 and $70,000. A vendor has indicated that vessel operators are interested in two scale sizes in this fishery, both are 1,450 mm (about four and three quarters feet) long, but one is 300 mm (about a foot) wide and the other is 600 mm (about two feet) wide. The choice will depend on available space in the location where the scale is installed. Additional costs are estimated to include approximately $4,000 to $5,000 for installation services provided by the vendor and about $200 to $700 for crew training time. The installation services include wiring and training, but do not include costs of spare parts, or of the factory modifications that will be required to adapt the factory to allow use of the flow scale (these are discussed below). A vendor representative estimates that training takes 2 to 4 hours, and that it is desirable to train two to three persons on a vessel, including the first mate and the factory manager.[26] Based on the estimates above, the scale would cost between $65,000 and $76,000. (Johannesson, pers. comm., June 16, 2011)

Flow scale failure could result in significant revenue losses, if a vessel must return to port for parts needed to make repairs. Vessels are therefore likely to purchase spare parts packages, in order to make repairs at sea. The pieces included in a motion compensated flow scale package will vary somewhat from

bleed tank, and a PRR of 0.98 if the scales are placed after the bleed tank. Under the proposed regulation, all fish going over the scales will be assumed to be Pacific cod.

[24] Use of a firm or product name does not imply endorsement by the National Marine Fisheries Service.

[25] The fact that only one firm currently sells scales approved for this purpose suggests that the price of the scales may exceed the marginal cost of production. Thus, the costs reported here may exceed the social costs of scale purchase. NMFS has no information that would allow it to estimate the degree to which these may differ.

[26] In this analysis, the costs of time for ships' officers are estimated to equal the costs of NMFS AKR staff with responsibilities for scales. Crew opportunity costs are assumed to be half of this. (These assumptions are used in this analysis to approximate the unknown opportunity costs for officers and crew. These assumptions are used in the absence of better information, following consultation with a representative of the freezer longline cooperative (Down, personal pers. comm., July 7, 2011)). The cost for a ships' officer is estimated at $56/hour, including benefits. Thus, training costs are assumed to range from the cost of two ship's officers for two hours, to three officers for four hours, at $56/hour/person.

vessel to vessel, and costs could range between $12,000 and $15,000; $13,000 may be a reasonable estimate. (Johannesson, pers. comm., June 16, 2011)

Cost of video monitoring equipment

Under this alternative, areas on the vessel in which sorting of Pacific cod occurs will be monitored by video cameras, and the vessel operator will be required to retain the digital images for 120 days. These requirements are necessary for several reasons. Video records will make it possible for NMFS to verify that no one is manipulating the scale, that only Pacific cod are crossing the scale, and that all Pacific cod caught are crossing the scale.

Under this alternative, a regulated vessel that has opted into the monitoring program and selected the scales option during a year must be in compliance with video monitoring requirements at all times when fishing for Pacific cod is open in the BSAI or GOA. The requirements will be adapted from requirements currently in §679.28(j), which apply to video monitoring of Chinook salmon PSC on American Fisheries Act pollock vessels. (Watson, pers. comm.)

The video monitoring system required by this alternative would have one or more color cameras, a digital video recorder (DVR) for storing the video, a monitor for reviewing the video, power sources, and cables to connect the different elements. The system must be operating when the catcher/processor is fishing (no matter the intended target species), and Pacific cod is open to directed fishing in either the BSAI or GOA. (§679.28(j)) As the fishery appears to be evolving at this time this is likely to be most of the year (Section 1.2.1).

Color cameras must have a minimum of 470 TV lines of resolution, auto-iris capabilities, and output color video to the recording device. The system must provide sufficient resolution and field of view to observe all areas where Pacific cod are sorted from catch, where fish pass over scale, and crew are active in these areas. The system must record at a speed of no less than 5 frames per second at all times when Pacific cod are being sorted. (§679.28(j)) The system may require from one to five cameras (depending on the vessel layout and lines of sight). (NMFS, 2009: 195-196; Watson, pers. comm.)

The DVR is basically a computer with a large hard drive and a USB port. The system must have sufficient data storage capacity to store all video data from an entire trip. Each frame of stored video data must record a time/date stamp in Alaska local time. At a minimum, all periods of time when Pacific cod are passing over the flow scale must be recorded and stored. The system must include at least one external USB (1.1 or 2.0) port or other removable storage device approved by NMFS. The video data must be maintained and made available to NMFS staff, or any individual authorized by NMFS, upon request. These data must be retained onboard the vessel for no less than 120 days after the date the video is recorded, unless NMFS has notified the vessel operator that the video data may be retained for less than this 120-day period. The system must use commercially available software. (§679.28(j)) (NMFS, 2009: 195-196)

In order to ensure that video can be monitored on board, a 16-bit or better color monitor, with the capacity to display all cameras simultaneously, must be provided. NMFS staff, or any individual authorized by NMFS, must be able to view any earlier footage from any point in the trip; the individual must be assisted by crew knowledgeable in the operation of the system if this is requested. (§679.28(j))[27] (NMFS, 2009: 195-196)

[27] A related requirement implemented in the American Fisheries Act pollock fishery as a part of recent Chinook salmon PSC measures under Amendment 91 required a waterproof or water-resistant monitor to be located at the observer sampling station, operating at all times when fish were flowing through the sorting area, or when

One estimate is that the equipment for a two camera system would likely cost between $5,000 and $10,000, while installation would likely cost between $2,000 and $5,000 (although, some firms may seek to hold down the installation costs by doing work themselves). Additional cameras would cost $1,000 to $2,000 each for equipment and installation. The range of costs reflects uncertainty about the equipment a firm might purchase. A second source says that the cost of installing video in the AFA fleet in connection with Amendment 91 was about $10,000 per vessel for equipment, and $5,000 to $20,000 for installation. (Pratt, pers. comm., July 8, 2011; Sundholm, pers. comm., August 8, 2011) In this analysis, assuming the firm contracts for the installation, total costs are assume to range from $7,000 (for a two camera system with minimal installation costs) and $36,000 (for a five camera system with installation costs at the high end of the AFA experience).

An equipment failure that cannot be fixed at sea could lead to a significant loss of revenues if a vessel had to stop fishing and return to port. As insurance against this, vessels are likely to choose to carry spare parts. A spare parts package might run $3,500. (Pratt, pers. comm., July 8, 2011)

Cost of observer sampling station

The specifications for an observer sampling station are contained in regulations (50 CFR 679.28(d)), and were described in the discussion of Alternative 2 in Section 1.1.4. The station must provide a working area of 4.5 square meters, a work table, and a platform scale, in proximity to a collection area where the observer can see the longline gear being retrieved, and can obtain fish samples.

Platform scales must be selected by the vessel operator from a list of approved scales published by NMFS AKR. This list includes 37 approved scale types. All of these are made by one of two companies, or by subsidiaries of one of these companies. (NMFS, no date; Watson, pers. comm.) A platform scale is estimated to cost between $7,000 and $10,000. (Johannesson, pers. comm., June 16, 2011; Cheung, pers. comm., July 22, 2011)

Many vessel operators are likely to carry at least two platform scales; in case of a platform scale failure at sea, which may threaten the vessel's ability to keep fishing, it may often be quicker and easier to switch out a defective scale than to repair it. Because of this, a second scale provides insurance against lost fishing time. Alternatively, it is also possible that a vessel could meet its requirements for a backup by carrying spare load cells and indicator panels, and switching these in if necessary in a scale that breaks down. These spares might cost between $5,000 and $6,000. (Cheung, pers. comm., July 22, 2011)

Some freezer longliners covered by this action already have platform scales on board. Vessels which have fished CDQ groundfish have been required to carry these in the past (although this requirement has been lifted since May 2011 [NMFS 2011d]). Vessels may also carry platform scales for their own purposes, such as quality control. (Watson, pers. comm.)

This analysis bases the cost estimates on the assumption that some vessels will not need to purchase additional scales, and that some will purchase as many as two scales, the second playing the role of a "spare parts package". Thus, costs are estimated to be between $0 and $20,000.

The costs of the observer sampling station would also include the costs of materials used to fabricate the table, and other costs that may be associated with the installation of the work space. The installation of a

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salmon were in holding tanks. This requirement is not necessary for this action. A monitor must be available on board, permitting NMFS or NOAA OLE staff to view video footage, but this monitor need not be located at the observer sampling station, and consequently does not have to be waterproof or on continuously. (Watson, pers. comm., July 22, 2011)

sampling station within the constricted area of the factory, may have an impact on factory efficiency. It is difficult to separate the fabrication costs (other than those for the purchase of specific equipment) from the installation costs. Fabrication costs and efficiency costs are not estimated separately here, but are assumed to be included in the discussions of costs in the following sub-sections on installation and factory efficiency.

Installation

The actual costs of engineering, materials, and construction to renovate the factory to accommodate the flow scale, observer sampling station, and video monitoring equipment, will vary considerably from vessel to vessel, and are very difficult to estimate quantitatively. Since they depend on detailed information about each vessel's internal layout, existing factory configuration, and product flow, they are impossible to predict in advance without a great deal of information on each vessel and without engineering analysis by factory design experts. Estimation, even after the fact, could be complicated if some vessels combine the installation of new equipment required by this action with a general reconstruction of the factory deck done for this and other purposes.

Knowledgeable persons have different views on the potential range of installation costs.[28] These persons find these costs difficult to characterize precisely, and the range of cost estimates varies by person. The lower bound of the estimates is $20,000 and the upper bound is $300,000. The lower end would be for an unusually inexpensive installation; the upper bound may involve a situation where other, unrelated, work was done at the same time. Comments suggest that many installations will be between $30,000 and $100,000. (Down, pers. comm., July 8, 2011; Kinsolving, pers. comm., July 22, 2011; Johannesson, pers. comm., June 16, 2011; Little, pers. comm. July 29, 2011). The analysis of the cost of installing flow scales for the groundfish trawlers under Amendment 80 indicated that the total cost of installing flow scales and observer sample stations to weigh groundfish catch on vessels covered by that action could range between $20,000 and $250,000 per vessel. (Council, 2007a: 372) For the purposes of this analysis, a wide range of potential costs, $20,000 to $300,000, has been adopted. The center of the distribution is likely to be between $30,000 and $100,000.

Inspections, maintenance, and repairs

Motion compensated scales, platform scales, video monitoring equipment, and observer sampling stations must meet requirements set out in regulations. All of these are subject to wear and tear and modification, which may affect their characteristics or operation. Because of this, regulations require annual inspection and certification by agency staff.

Scale and video inspections are the responsibility of the Sustainable Fisheries Division of the NMFS AKR; observer sampling station inspections are the responsibility of the Fisheries Monitoring and Assessment (FMA) Division of the NMFS Alaska Fisheries Science Center (the observer program).

Motion compensated flow scales: The inspector will check to make sure the scale is properly installed, that all components of the scale are functioning (printer, display, software), and that it can pass a performance test. The performance test consists of weighing a known quantity of test material and making sure the scale weighs the material accurately. NMFS performs scale inspections in Dutch Harbor, Kodiak, or Puget Sound. Requests for scale inspections need to be submitted at least 10 working days in advance of the requested inspection. (NMFS, no date).

[28] NMFs consulted with persons in the fishing and equipment supply industries, as well as drawing on in-house expertise.

In addition to the NMFS inspector, an inspection may involve a technician from the scale vendor, the port engineer[29], the deck boss, and one or two crew members. An inspection begins when the inspector arrives with equipment, including over 600 pounds of weights, for use in testing the equipment. Regulations require the vessel operator to help the inspector move his equipment to the location of the scales within the vessel. If present, a technician from the scale vendor can make adjustments to the scale. Testing can require from one to as many as ten hours, depending on the types of problems identified, but three to four hours is the norm. In addition to the time required for the test, the NMFS staffer requires about two hours for paperwork, scheduling the test, and documenting the results in a computer file. (Kinsolving, pers. comm.)

During the first year of the program, testing is likely to involve an additional trip to visit the vessel and an additional hour on site. NMFS staff will visit vessels prior to installation of the flow scales to review planning and the position of the scale, to ensure that placement plans are appropriate. (Watson, pers. comm.)

Factory trawler inspections are often carried out at Seattle's Pier 91, adjacent to the firm which currently provides the flow scales to the industry, and where large numbers of vessels congregate late in the year. With the vessels grouped in one place, adjacent to the vendor, it is possible to carry out multiple inspections in a short period of time with minimal overhead costs for travel by inspectors and vendor technicians. The freezer longline fleet is less likely to be found congregated in a single area at one time, and less likely to congregate at Pier 91. For this reason, overhead costs are likely to be higher in this fleet than in the factory trawler fleet. Vessels may find ways to congregate in order to economize on these costs. Freezer longliners are more likely to be inspected in Dutch Harbor than the factory trawlers have been. (Watson, pers. comm.)

Observer sampling station: The observer sampling station (not including the platform scale) is checked for compliance with regulatory requirements (described in Section 1.1.4) and certified by the Alaska Fishery Science Center's FMA Division's Observer Program (advanced notification scheduling inspection is required). The platform scale itself is checked and certified by NMFS AKR staff. Certification is good for one year.

Recent experience suggests that annual inspections of observer sampling stations in this fleet take from 10 to 40 minutes on site for two staffers[30], to which should be added travel time for the staffers, and 20 minutes per vessel for paperwork by one person. Most travel requires about an hour round trip; some inspections can take place away from Seattle, for example in Tacoma and Bellingham, and travel time to these places is significantly greater. Inspection times appear to be shorter than in some other fleets, as observer sampling stations are modified infrequently. A vessel representative is usually present during these inspections. Initial first-year inspections, on vessels outside the CDQ fleet which have not had observer sampling stations, are likely to require two visits by the inspectors, with 1.5 hours on site. (Thompson, pers. comm. June, 2011)

[29] The port engineer is a company employee handling vessel-related issues while the vessel is in port.

[30] Experience is available, since freezer longliners catching CDQ Pacific cod must already have observer sampling stations by regulation. Changes for CDQ vessels that became effective in May 2011 eliminate this requirement (NMFS 2011d). Thus, any sampling station inspection and certification costs will be attributable to the current action.

For the purposes of this analysis, total agency time per vessel inspection is estimated to be about 3.5 person- hours; time for the initial first-year inspection is estimated to be 7.5 person-hours.[31] Assuming a ship's officer is present during the on-site portion of each inspection trip, an annual inspection would require 0.5 hours for a vessel's officers, while the initial inspection would require 1.5 hours. As shown in Table 6, 15 vessels harvested CDQ Pacific cod in 2010, and can be assumed to have carried observer sampling stations. Thus, these vessels will be assumed to not require initial inspections.

Motion compensated platform scale: The motion compensated platform scale that is a part of the observer sampling station is also checked and certified annually. This is the responsibility of the Sustainable Fisheries Division of the NMFS AKR. NMFS estimates that it takes 40 minutes of staff time for a typical inspection and for documentation. NMFS does not anticipate that this inspection will create significant additional costs for the vendor or vessel crew. This analysis assumes that vessels will have one or two platform scales requiring inspection. Travel time is assumed to be included in the travel time required for flow scale inspections. (Watson, pers. comm. June 16, 2011)

Video monitoring equipment: In a normal year, NMFS anticipates that the inspection of a vessel's video equipment, and associated paperwork, will take an hour and 10 minutes of staff time and an hour's time from the vessel's engineer. Inspections, during the first year, may require one to two visits. NMFS estimates that on-site staff time will be one to three hours, with a median of two hours. An hour would be required to modify the agency inspection data base in the first year. NMFS also anticipates that in the first year, the vessel captain and engineer will both participate. Time spent bringing a video system into compliance between a first and second visit is assumed to be covered by purchase and installation costs, as discussed above. Travel time is assumed to be included in the travel time required for flow scale inspections. (Watson, pers. comm. June 16, 2011)

Summary of inspection and certification costs. Table 12 summarizes the annual inspection and certification costs for an individual vessel after the first program year, and Table 13 summarizes the higher inspection and certification costs for the first program year.

Table 12. Summary of estimated labor requirements and costs for annual vessel inspections after the first program year

	NMFS		Vendor	Crew	
	Alaska Regional Office	Fisheries Monitoring and Analysis		Officers	Other
Flow scale (hours)	6.0	0.0	4.0	8.0	8.0
Platform scale (hours)	0.7	0.0	0.0	0.0	0.0
Observer station (hours)	0.0	3.5	0.0	0.5	0.0
Video (hours)	1.2	0.0	0.0	1.0	0.0
Total (hours)	7.8	3.5	4.0	9.5	8.0
Compensation/hour	$56	$33	$90	$56	$28
Total cost	$441	$115	$360	$534	$225

Source: Thompson, pers. comm.; Watson, pers. comm.
Note: apparent discrepancies due to rounding

[31] The basic inspection time assumes two persons, each with 1 hour travel time and 30 minutes for the inspection, and one person with about a half hour of paperwork. The initial inspection is assumed to add about one hour each for the two persons on the inspection site, plus one hour each for travel time for a second trip.

Thus, estimated labor costs per vessel are $556 incurred by NMFS, $1,119 incurred by the private sector, and $1,675 in all. NMFS estimates that its annual transportation expenses associated with certifications will be about $3,800.[32] With a 33 vessel fleet, costs would thus total about $59,000 a year. The rationalization of this fleet is likely to lead to a reduction in the number of vessels participating in the fishery and, consequently, a reduction in the number of inspections and their cost. It is not possible, however, to predict the extent to which the fleet, and these costs, will be reduced through time.

Table 13 provides estimates of on-site costs for NMFS, private vendors, and vessels in the first year of the program. Estimated labor costs per vessel are $846 incurred by NMFS, $1,603 incurred by the private sector, and $2,449 in all. NMFS estimates that its annual transportation expenses associated with certifications in the first year are $55,000.[33] Transportation costs are significantly higher in the first year because most vessels will receive pre-inspection visits from NMFS staff to help with planning installations, and in order to reduce potential problems when actual inspections take place. Moreover, NMFS will not use its Dutch Harbor based staff to conduct first year inspections. With a 33 vessel fleet, costs would, thus, total about $136,000. If some operators know they will be withdrawing a vessel from the fleet, they may choose not to make the modifications discussed here. However, NMFS is not currently in a position to project how many vessels may choose not to make these installations.

Table 13. Summary of estimated labor requirements and costs for vessel inspection during the first program year

	NMFS		Vendor	Crew	
	Alaska Regional Office	Fisheries Monitoring and Analysis		Officers	Other
Flow scale (hours)	7.0	0.0	5.0	10.0	10.0
Platform scale (hours)	0.7	0.0	0.0	0.0	0.0
Observer station (hours)	0.0	7.5	0.0	1.5	0.0
Video (hours)	3.0	0.0	0.0	4.0	0.0
Total (hours)	10.7	7.5	5.0	15.5	10.0
Compensation/hour	$ 56	$ 33	$ 90	$ 56	$ 28
Total cost	$ 600	$ 246	$ 450	$ 872	$ 281

Source: Thompson, pers. comm.; Watson, pers. comm.
Note: apparent discrepancies due to rounding.

In addition to the annual inspections and the relatively intensive inspection work required to prepare for the first year of the program, scales and video monitoring equipment will require additional daily testing and maintenance and repairs.

Daily testing: Tests of the flow scale must be conducted once every 24 hours while the scale is being used to weigh catch. The test is conducted by weighing at least 400 kg of fish or other material on the flow and platform scales, and comparing the weights. The flow scale weight must be within 3 percent of the platform scale weight. If the difference is greater than 3 percent, the flow scale cannot be used until it has been retested, perhaps after adjustment such as tightening the belt, and found to produce results within 3 percent of the platform scale. A report of the test, provided on a standard form, must be signed by the

[32] This estimate assumes two additional trips to Seattle a year, in the early summer (inspections in Dutch Harbor and in Seattle at the end of the year should not require additional travel). Costs include air fare, hotel, per diem, and truck rental in Seattle.

[33] This is estimated on the basis of 18 pre-inspection trips (assuming about 2 vessels per trip), and 9 inspection trips. (Watson, pers. comm.; Kinsolving, pers. comm.; Campbell, pers. comm.).

observer and the vessel operator (who attests that he observed the test). The report must then be retained on the vessel until the end of the fishing year, and by the vessel owner for three years thereafter. (NMFS 2011b: 1-2) The test requires perhaps 10 minutes of attention from the observer, the factory foreman, and a crewmember. This cost has not been monetized, because both observer and crew would already be present at sea. To the extent that this requirement creates costs, they are assumed to be treated below as an impact on plant efficiency attributable to diverting the attention of crew from other activities.

Routine maintenance: Normal flow scale maintenance involves a number of elements, including a daily test, cleaning, three to four brief calibrations during a working day, greasing the scale, tightening belts, replacing belts two to three times a year, periodic replacement of sprockets, and annual vendor service at the time of certification. Annual maintenance costs are estimated at about $5,000. Platform scales may also require some annual maintenance; available cost estimates range from $0 to perhaps $500 a year. Assuming a video technician spends a day on the vessel each year, to inspect and adjust the system, prior to annual inspection and certification by NMFS, and that repairs costs begin to increase in the third year, maintenance costs are expected to be about $1,000 in years one and two, and to average $1,500 a year thereafter. (Johannesson, pers. comm., June 16, 2011; Pratt, pers. comm., July 7, 2011; Cheung, pers. comm., July 22, 2011).

Repairs: Vessels will have to suspend fishing operations if they experience a scales breakdown that they are unable to fix at sea. This may necessitate a return to port for repairs. However, in most cases, vessels are likely to be able to make repairs at sea. Vendor representatives can provide technical support via radio, satellite, phone, or internet, and, as described earlier in this section, vessels may purchase spare parts packages to insure against the possibility of a loss of fishing time. These packages include the parts the vessel operator may need to make those repairs that can be made at sea with the verbal assistance from the vendor. (Johannesson, pers. comm., June 16, 2011)

Monitoring of video: The NMFS Alaska Regional Office is likely to review some video records each year, in an effort to monitor activity, to provide a deterrent to potential violations, and to encourage consistent use of the video system. NMFS estimates about 20 hours for collecting and curating digital video, and 40 hours/year for review. (Kinsolving, pers. comm., May 16, 2011) Assuming the same $56/hour cost for wages and benefits used to evaluate inspections on the vessels by Alaska Regional Office staff, the annual cost would be about $3,400. Video records will be available for enforcement purposes. Given the uncertainty related to the occurrence of enforcement actions, a quantitative estimate of this potential program costs has not been included in this analysis.

Impact on harvesting and factory efficiency

The installation of scales and sampling stations may reduce processing efficiency on some vessels. Space will have to be found in crowded factories for the flow scale and observer sampling station. The flow of Pacific cod and other species through the factory will be changed by the insertion of the scale into the processing line. These impacts would vary among vessels, depending on factory configuration.

As noted above, the maintenance and inspection of the scale will divert crew attention from other duties for small periods of time each day. This could have a minor impact on efficiency, which is not monetized in this analysis.

If a scale, or the video monitoring equipment, break down the vessel will have to make repairs before it can resume fishing. If the vessel can make repairs at sea, operations may only be interrupted for a brief period. If it cannot make repairs at sea, a longer suspension may be necessary as the vessel travels to port to make repairs.

While the comments above suggest that scales and sampling stations may reduce vessel efficiency, it is also possible that the introduction of scales and sampling stations will enhance vessel efficiency. Improvements in the accuracy, precision, and timeliness of information on catch weight may allow skippers to fish more closely to their quota shares; with greater certainty about their catch status, they would not have to be as conservative as they otherwise would have had to be. (Down, pers. comm., July 7, 2011).

Quantitative estimates of these impacts cannot be made with available information. Vessels will differ considerably in their factory layout and product flow and this will impact efficiency in ways that are difficult to quantify. Research results on quantitative measures of the efficiency impacts from this source in other fleet sectors are not available. These measures are new to the longline catcher/processor sector, thus, empirical experience with them is limited.[34]

Increased Observer Coverage

In the past, observer requirements in this fleet have varied, depending on vessel size and whether or not the vessel was fishing for CDQ groundfish. Vessels between 60 feet and 125 feet LOA that were not fishing for CDQ groundfish were required to carry one observer on 30 percent of fishing days; vessels over 125 feet, not fishing for CDQ Pacific cod, were required to have one observer 100 percent of fishing days, and vessels fishing for CDQ groundfish were required to carry two observers 100 percent of fishing days. With the changes that NMFS expects will be implemented by January 2013, under the "no action" alternative all of these vessels will be required to carry one observer 100 percent of their fishing days, whether or not they are fishing for Pacific cod.[35]

The "scales" alternative adds a requirement that the single observer be a "level 2" lead observer. Lead level 2 requirements were described in the discussion of the scales alternative, Alternative 2, in Section 1.1.4. The lead level 2 requirement is discussed in Section 1.3.4.

Electronic logbook

This action will require freezer longline vessels to begin using an electronic logbook module as an addition to their existing "Sea landings" application of eLandings software. This requires software development by the NMFS Alaska Regional Office, distribution and installation of the software, and training for vessel officers in the use of the software. Total software development costs are not certain at this time, but they are estimated to range between $30,000 and $100,000. Software delivery is inexpensive. Installation may be carried out by crew, or by NMFS staff. For the purpose of projecting costs, NMFS assumes that training and distribution will take place at a workshop with vessel operators in May 2012 in Seattle. The logbook software would be distributed on a CD at that time. The cost of this to NMFS is the cost of time required for workshop preparation and delivery, and of travel between Juneau and Seattle. (Mondragon, pers. comm., July 25, 2011). Assuming the workshop is conducted in connection with a freezer longline meeting, and takes three hours during the course of a morning, private sector costs are assumed to be about $5,500 and NMFS costs are assumed to be $2,800.[36]

[34] By July 2011 one vessel had installed scales, and other vessels were expected to have done so within a few more months (Kinsolving, pers. comm.).

[35] These are described in the discussion of the no action alternative in Section 1.1.4.

[36] Private costs assume a three hour workshop attended by an officer from each of the 33 vessels at $56/hour. Public costs include three days of time at $56/hour, $1,230 in travel expenses, and $200 for hall rental.

Additional issues

For tax purposes, the purchase price of physical capital such as motion compensated flow scales and video monitoring equipment would be depreciated over a period of years, reducing a firm's taxable income and taxes. While reductions in tax payments by fishing businesses or their stockholders and owners are a benefit to the firms, they are associated with a reduction in tax receipts and public services. Thus, there is no net benefit with respect to a cost-benefit analysis done from a national accounting stance. The information that would allow NMFS to make estimates of tax impacts is not available to it.

Firms may finance investments by drawing on a line of credit, seeking new loans, or from retained earnings. A firm that incurs interest charges incurs a real, firm-specific, cost. While this is a real cost to the vessel operator, the cost is offset by equal revenues accruing to the lender (setting aside issues of possible public subsidies to the banking industry). The information that would allow NMFS to make estimates of cost impacts to individual firms is not available to it.

Public sector costs

The importance of scales, video monitoring, and observer sampling stations, in the monitoring process, and the potential for manipulation of scale weight estimates, means that scales, video equipment and sampling stations are regulated, and their status is monitored by NMFS staff. This creates costs for the agency that are paid for by the general public, ultimately through taxation. Although provisions exist for cost recovery under certain conditions, these conditions do not appear to apply in this instance.[37]

In the first year, NMFS incurs costs of $25,740 for on-site inspection time on 33 vessels, and transportation costs of $55,000, electronic logbook development costs of $30,000 to $100,000, electronic logbook workshop costs of $2,800, and video monitoring costs of $3,400, for a range of about $117,000 to about $187,000.

In subsequent years, annual costs are $18,348 for on-site inspection costs, $3,800 for transportation, and $3,400 for video monitoring, for a total of about $26,000.

Estimated aggregate costs of the scales alternative (Alternative 2)

Table 14 summarizes the costs of the scales alternative, Alternative 2, for an individual vessel in the BSAI freezer longline fleet. The total costs for the fleet of vessels are estimated to equal the product of the average cost per vessel, as described in the table, and the number of vessels fishing under the cooperative's catch sharing plan.

[37] In 1996, the Magnuson-Stevens Act was amended (by Public Law 104-297) to require, among other things, that the Secretary of Commerce "collect a fee to recover the actual costs directly related to the management and enforcement of any . . . individual fishing quota program" (section 304(d)(2)(A)). The upper limits on these fees, fee collection times, and fee deposit locations are specified by section 304(d)(2) of the Magnuson-Stevens Act. Section 303(d)(4) of the Magnuson-Stevens Act allows NMFS to reserve up to 25 percent of the fees collected for use in an IFQ loan program to aid in financing the purchase of IFQ or QS by entry-level and small-vessel fishermen. (NMFS 2006: 5) Freezer Longline Conservation Cooperative activities are not presently subject to cost recovery requirements under the Act.

Table 14 Summary of scales alternative costs for an individual vessel

Cost category	Low end of range	High end of range
First year costs		
Flow scale purchase	$ 65,000	$ 76,000
Flow scale spare parts	$ 12,000	$ 15,000
Video purchase and installation	$ 7,000	$ 36,000
Video spare parts	$ 3,500	$ 3,500
Platform scale purchase	$ 0	$ 10,000
Spare platform scale	$ 0	$ 10,000
Construction and installation	$ 20,000	$ 300,000
First year inspections	$ 1,600	$ 1,600
Electronic logbook	$ 200	$ 200
Maintenance	$ 6,000	$ 6,500
Subtotal monetized first year costs	$ 115,300	$ 458,800
Total for 33 vessels	$ 3,804,900	$ 15,140,400
Non monetized first year costs	Possible increment in observer costs for lead level 2 qualification; potential positive or negative impacts on plant efficiency; issues related to changes in firm tax liabilities or the financing of investments; normal repairs are partly covered under maintenance, replacement of spare parts packages and extraordinary repairs requiring return to port, lost fishing time, and visit from vendor representative, are not covered.	
Later year costs		
Later year inspections	$ 1,100	$ 1,100
Maintenance	$ 6,500	$ 7,000
Subtotal monetized subsequent years' costs	$ 7,600	$ 8,100
Total for 33 vessels	$ 250,800	$ 267,300
Non-monetized costs	Possible increment in observer costs for lead level 2 qualification; normal repairs are partly covered under maintenance, replacement of spare parts packages and extraordinary repairs requiring return to port, lost fishing time, and visit from vendor representative, are not covered.	
Source: text in Section 1.3.1. Rounded to nearest $100. n.e. is not estimated.		

The fishery currently has 33 licensed vessels with 37 LLP licenses (Table 1). For the purposes of this analysis, the number of active vessels is estimated to be 33. Efficiencies associated with the plan may lead to reductions in the number of operational vessels. Because reductions in the fleet size are more likely than increases, under rationalization, these costs estimates are probably high.

A reasonable low end cost estimate for installation on a single vessel is about $115,000 and a reasonable upward estimate is about $460,000 (Table 14). Few vessels are expected to come in at either extreme. The lower end of the range implies a potential installation cost of $3.8 million for 33 vessels, while the upper end implies an installation cost of $15.1 million. Since the range of costs is extreme, and few vessels are likely to find themselves at the extremes, these bounds are also extreme bounds.

The range of ongoing annual private costs, after the first year of the program, is not large, and both ends round to about $8,000, or, for a fleet of 33 vessels, about $264,000 a year. Aggregate fleet costs will be lower if vessels withdraw from the fleet as firms rationalize their businesses under the cooperative's catch sharing arrangements. However, note that this estimate does not include repair costs, potential efficiency cost or benefits, the impact of depreciation on tax payments, or the interest costs on any debt incurred.

These costs will occur through time. The present values of these costs to the fleet have been estimated by approximating the future annual expenses as a perpetuity that must be paid, starting in the second year of the program, and adding them to the first year costs. The present values were estimated using real discount rates of 3 percent and 6 percent.[38] At a 3 percent discount rate, the present value for a vessel ranges from about $361,000 to about $721,000, and at a 6 percent discount rate, the present value for a vessel ranges between about $235,000 to about $586,000.

These do not include costs incurred by NMFS. These public costs will depend significantly on the costs of designing the software for the electronic logbook. As described above, total agency costs are estimated to be between $117,000 and $187,000 for the first year, and about $26,000 per year thereafter.

The costs provided here are based on the assumption that all the work would be completed after a decision was made to go ahead with the program. However, as this is written, it is widely anticipated that the program will be implemented. At the time of writing, at least one vessel has already installed scales, and other vessels are in the process of doing so. Some parts of the NMFS inspection process have already taken place. NMFS has already incurred some of the development costs of the electronic logbook. To the extent that many of these costs have already been incurred, they will reduce the actual costs of this alternative. Because the process of implementation has already begun, and because NMFS cannot know how far it may have advanced by the time this rule is adopted, the analysis has estimated costs from a point of time before any costs for this action had been incurred.

1.3.2 Alternative 3: Second Observer

Alternative 3 requires: (1) the installation of an observer sampling station; (2) the addition of a second onboard observer; (3) that at least one of the observers be lead level 2 qualified; and (4) use of an electronic logbook.

Observer sampling station

The regulatory requirements for an observer sampling station were described in the section on alternatives in Section 1.1.4, and the costs were discussed in Section 1.3.1. For the purpose of the analysis of Alternative 3, where there is no other construction, a cost of $10,000 has been used when a new station must be installed. This is a rough estimate subject to considerable uncertainty, especially for vessels on which space is relatively limited. (Down, pers. comm. September 8, 2011). Further, not all vessels will need to newly install a station. Therefore, this cost is estimated to range from $0 to $10,000.

The earlier discussion of motion compensated platform scales applies here; it is assumed that firms may choose not buy any, or that they may buy as many as two. As in the previous section, it is assumed that a

[38] Because future costs are projected on the basis of costs circa 2011, future costs are measured in real, rather than nominal terms. Thus, a real interest rate has been used for this analysis. The rate for corporate bonds rated Baa by Moodys in July 2011 (5.76 percent) was used as an estimate of the appropriate nominal interest rate, to approximate the level of risk for the affected fishing firms. Expected inflation (2.65 percent per year) was estimated by subtracting the July 2011 rate for 30 year Treasury Inflation Protected Securities (TIPS) from the July 2011 rate for 30 year U.S. Treasury bonds (estimated inflation = 4.27 percent – 1.62 percent). The real interest rate was estimated using a standard formula: r = (i-m)/(1+m), where r is the real interest rate, i is the nominal rate, and m is expected inflation. The real rate of 3.03 percent was rounded to 3 percent. For a sensitivity analysis, a higher real rate of 6 percent was also used. This higher rate has the effect of making the observer alternative, a larger proportion of whose costs occur in the future, look relatively more attractive. All interest rates were obtained from the St. Louis Federal Reserve Bank's FRED data base. The methodology follows an approach in Boardman et al. (page 149).

vessel officer must spend a half hour to assist with inspection the first year, if the vessel already has a station, and an hour and a half to assist with the inspection, if the station is new.

Depending on the vessel, therefore, it is assumed that the costs of the observer sampling station may range from $0 to $30,100. Assuming that, of the 33 vessels, 15 have observer sampling stations (15 vessels fished CDQ Pacific cod in 2010), and that the remaining 18 vessels do not, the estimated average cost would be about $16,400.

Lead level 2 observer and the electronic logbook

The cost of the lead level 2 observer is covered in detail in Section 1.3.4. As also discussed in Section 1.3.1, NMFS estimates that the electronic logbook requirement will cost each vessel about $200 for software acquisition and training.

Industry second observer costs

Under the no action and scales alternatives (Alternatives 1 and 2), this fleet will be subject to 100 percent observer coverage. The key additional cost for Alternative 3 is the requirement to carry a second observer. An appendix in the observer restructuring analysis estimated a daily cost to the vessel of $365.72 for observers in the unrestructured portion of the observer program[39] (Council 2010a: A-24; Maier, pers. comm. July 7, 2011), and this value has been used in this analysis.

Under Alternative 3, vessels would be required to carry a second observer when they were fishing in the BSAI or GOA, or when they were fishing CDQ groundfish, at any time when the season for fishing Pacific cod was open. The working assumption in this section is that changes in the seasonal apportionment of the halibut PSC allowance, and the rationalization of the fishery, are extending season length so that Pacific cod fishing will be open to this fleet for the entire year. Thus, the analysis assumes that vessels will be required to have two observers on board, while groundfish fishing at any time during the year.

In past years, there has been a large range in the number of days spent groundfish fishing by the vessels in this fleet. Figure 5 contains histograms showing the range in the number of observed groundfish fishing days for 100 percent observed vessels (part (a)), the range in the number of observed fishing days for 30 percent observed vessels (part (b)), the range in the number of estimated total fishing days for 30 percent observed vessels (part (c)) and the range in the number of estimated total groundfish fishing days for both classes of vessels combined (part(d)). [40]

The implications of 30 percent coverage for days fishing estimates were discussed earlier in Section 1.2.1. That section explained that vessels with 30 percent observer requirements often carry observers on more than 30 percent of fishing days, because of (1) CDQ requirements, (2) voluntary agreement to 100 percent observer coverage in the GOA, and (3) costs of acquiring and discharging observers in the BSAI.

[39] This daily cost estimate includes adjustments for transportation costs and travel time to and from the assignment. (NMFS 2010: A-24) This estimate is based on general observer program experience, and may only approximate the costs in the specific conditions of the BSAI freezer longline fishery.

[40] Observations are for an individual vessel, during one year, over the period 2004 through 2010. Observations from 2011 were not included here, since 2011 is incomplete. This eliminated 29 observations, leaving 79 observations for 30 percent vessels, and 182 for 100 percent vessels. Five observations for which no observer days were available have not been included in this analysis. Since observations are vessel-year observations, vessels generate multiple observations.

Anecdotal evidence, reported in Section 1.2.1, suggests that, because of point (3), non-CDQ BSAI coverage may actually be from 50 percent to 70 percent of fishing days.

Vessels in this fishery subject to the 30 percent requirement are believed to have actually spent more than 30 percent of their fishing days with observer coverage (see the discussion of "Time spent fishing" in Section 1.2.1). The distribution of the estimated total fishing days for 30 percent vessels, reported in part (c) of the figure was estimated by assuming that observed days fishing for Pacific cod in the GOA and for CDQ Pacific cod in the BSAI, accurately reflect total days fishing, and estimating non-CDQ groundfish days in the BSAI and GOA on the assumption that 67.8 percent, rather than 30 percent, of these days were observed.[41] Finally, Figure 5 includes a histogram showing the distribution of the combined 100 percent vessel total fishing days, and estimated (adjusted) 30 percent vessel total fishing days.

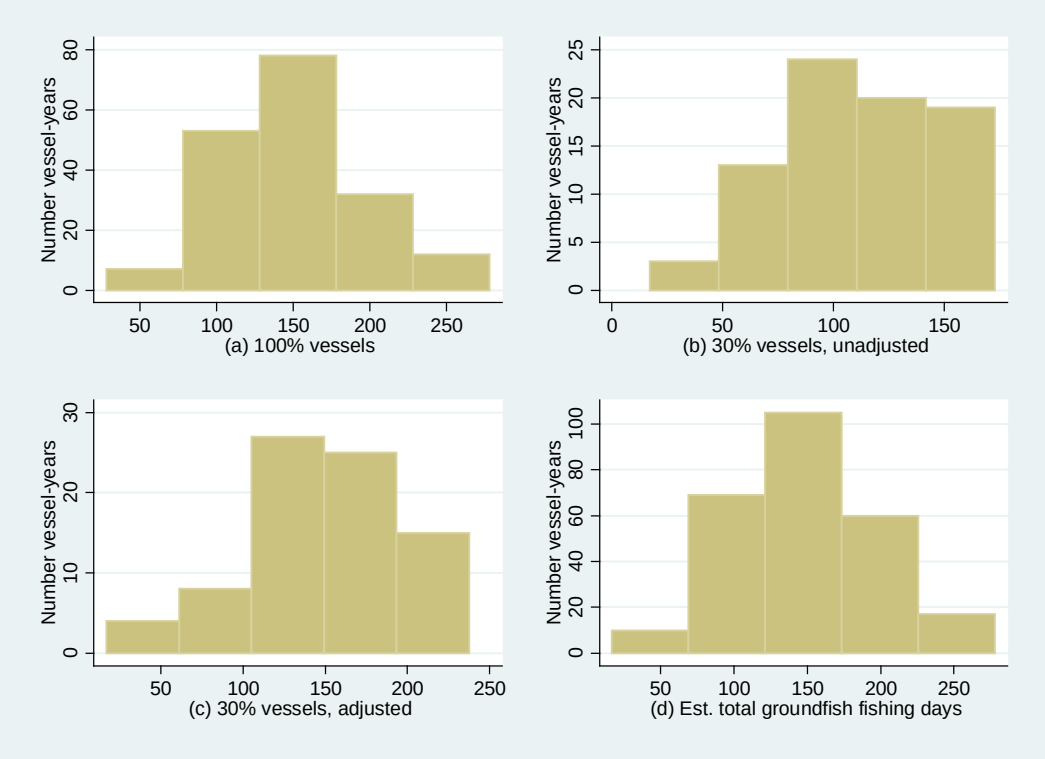

Figure 5 Distribution of vessel-year observed and total groundfish fishing days

Source: AKFIN data supplied July 21, 2011, and evaluated by NMFS AKR.
Note: The estimation procedure is described in the text.

[41] Since "observed days=(x percent)*(total days)", then "estimated total fishing days = (observed days)/(x percent)". The adjustment does not modify the days spent in the CDQ fishery or in the GOA, since these already have 100 percent coverage. The 67.8 percent estimate falls within the anecdotal range estimate described in Section 1.2.1. The specific value used here was the value that set median 30 percent vessel groundfish fishing days approximately equal to median 100 percent vessel groundfish fishing days, based on observer days. While a constant adjustment factor has been used for all vessels here, the actual multiplier should vary by vessel. Assuming that vessels with extreme values in one year tend to have more centrally located values in other years, vessels with a large number of observed days are more likely to require a smaller average multiplier, and vessels with smaller numbers of observed days are likely to require a large average multiplier. Thus, this approach would tend to overstate the proportions of observations in the tails of the distribution. The calculation excluded days from 2011, because 2011 is incomplete. The adjustment doesn't just shift the distribution for the 30 percent vessels to the right, but also changes its appearance, since not all days are adjusted, and the proportion of adjusted and unadjusted days differs by vessel, depending on the vessel's involvement in CDQ and GOA fisheries.

The 10th percentile of the estimated total groundfish fishing days for the combined 100 percent and 30 percent observed vessels was 95 days, and the 90th percentile was 213. The median was 151 days. [42]

Figure 6 provides summary comparative information on the distributions of estimated present value of costs for Alternatives 2 (the scales alternative) and 3 (the two observer alternative). The discussion here will focus on the distribution associated with Alternative 3.[43] Alternative 2, and the comparison of Alternatives 2 and 3, will be discussed in the next section (on Alternative 4).

Figure 6(a) duplicates the distribution of estimated total fishing days, shown in Figure 5(d). Figure 6(b) shows the implied distribution of total annual costs for the second observer, using the estimate of $365.72 per observed fishing day, and an estimate of $16,400 for the installation of the sampling station. Figure 6(c) and Figure 6(d) show the distribution of present values assuming 3 percent and 6 percent real discount rates. These present values are based on two important assumptions. First, for simplicity, they have been calculated as perpetuities; that is, they assume equal annual observer costs each year, forever.[44] Second, the constant cost in each instance is the estimate from the vessel-year observation in part (b) of the figure.[45]

The result of this vessel-year approach will be to exaggerate the number of observations in the tails of the distribution, since an extreme value for a given vessel is likely to be associated with other observations closer to the mean or median. If vessels, rather than years, were giving rise to the projected cost time streams, the observations would be more likely to be grouped closer to the center of the distribution, as lower cost years offset higher cost years.

The distribution of the estimated annual costs can be seen in Figure 6(b). The 10th percentile for these costs was about $35,000 and the 90th percentile for these costs was at about $78,000. The median value was about $56,000. The distribution of present values using a 3 percent real discount rate can be seen in part (c) of the figure. The 10th percentile value for these was about $1,184,000 and the 90th percentile was about $2,623,000. The median was about $1,867,000. The distribution of present values using a 6 percent real discount rate can be seen in part (d) of the figure. The 10th percentile value for these was about $600,000, while the 90th percentile value was about $1,320,000. The median value was about $942,000.[46]

[42] The discussion focuses on the 10th and 90th percentiles as measures of the distribution (a) to protect data confidentiality by not providing the high and low costs, and (b) offset potential bias from the tendency of the analysis to overstate the numbers of observations falling in the tails of the distributions (for reasons discussed earlier). This approach is also taken for the discussion of the distributions shown in Figure 6.

[43] The range of Alternative 2 (scales) costs is shown by the red vertical bars in parts (c) and (d) of the figure.

[44] The value of a perpetuity is calculated as "value perpetuity = (annual value)/(discount rate)."

[45] Thus, a vessel that fished three years, for 130 days, 150 days, and 160 days, would generate three observations in this distribution, one based on each of those annual days fishing activity. Each of these observations would be associated with a cost ($47,544; $54,858; and $58,515) and each cost would generate a present value in the distribution ($1,584,800; $1,826,600; and $1,950,500 with a real discount rate of 3 percent).

[46] An annuity calculated over a shorter time period than the perpetuity formula used in the figures would still tend to make the scales alternative look less expensive, although not to the same extent. As a sensitivity analysis, the present values are calculated here as if they were for an annuity at 6 percent, with the costs occurring over 30 years. In this case, the present values for the scales alternative would have ranged between $213,000 and $563,000, while the present values for the two-observer alternatives would have ranged between $449,000 and $1,039,000 (using the 10th and 90th percentile cutoffs). The use of the 6 percent rate discounts future costs more heavily, and is more favorable to the second observer alternative that the 3 percent rate. As noted elsewhere, the approaches taken to the determination of the ranges tend to spread them out, so overlap will appear greater than it is likely to be in reality.

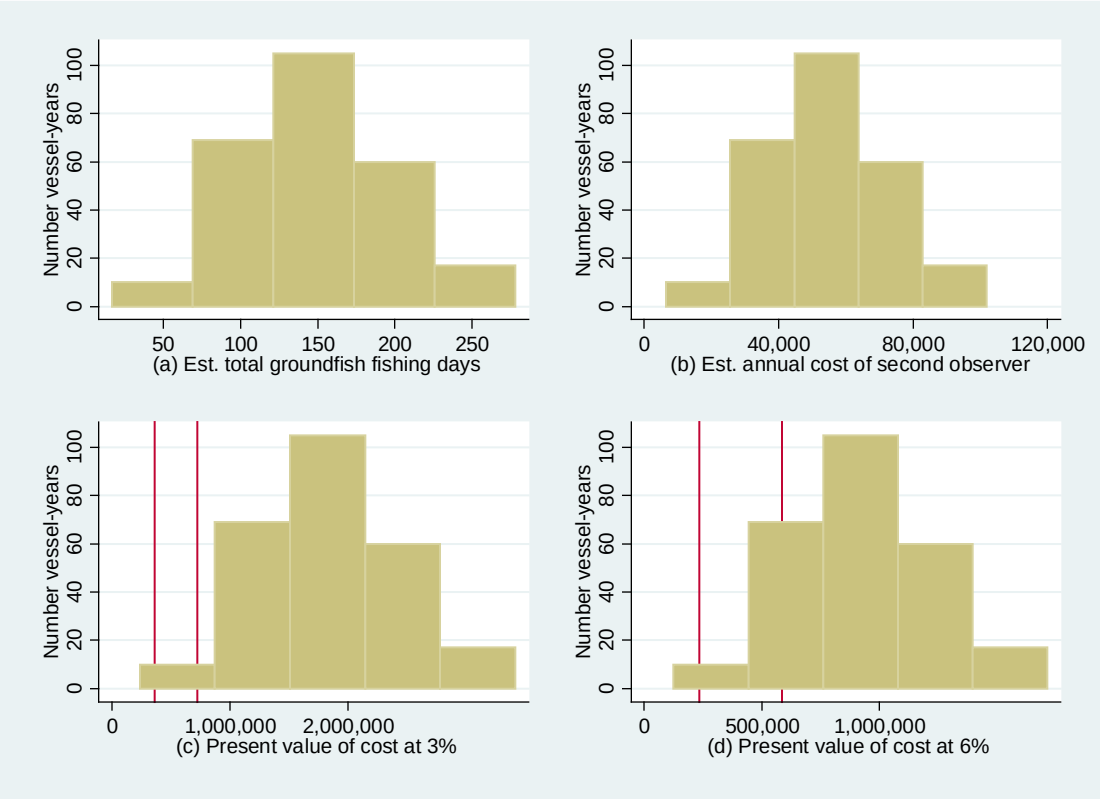

Figure 6 Distribution of annual costs and present value of costs for Alternatives 2 and 3

Source: AKFIN data from July 21, 2011 and NMFS AKR analysis

Observers could impose other costs as well. Modifications may be necessary to crew spaces to make it possible to carry an additional observer. In the past, smaller 30 percent coverage vessels have often met their observer requirements by leaving a crew member ashore when carrying an observer. In the present instance, vessels may adapt to the additional observer requirement by reducing the crew by one person (Down pers. comm. July 7, 2011). This might create operating inefficiencies.

These costs are difficult to estimate. Vessels vary and without more information it is not known what modifications or crew changes might be needed to accommodate a second observer in any specific case. Moreover, the fleet would be expected to rationalize under cooperative's catch sharing arrangements; the number of vessels is likely to decline, catch rates may decline (as in the fall of 2010 and first half of 2011), and the average days fished per vessel may increase. Changes like these would affect the number of days for which observer coverage would be needed. However, the sizes of these effects, and their net impact, cannot be determined at this time.

Public costs for this alternative

The electronic logbook was discussed in Section 1.3.1. The cost to NMFS of software development was estimated to be between $30,000 and $100,000, and the cost to NMFS of distribution, installation, and training was assumed to be $2,800. Subsequent annual costs are assumed to be zero.

NMFS will incur costs of about $5,000 for the initial year inspections of the observer sampling stations; in subsequent years the cost is estimated to be about $3,800.[47]

FMA costs will also increase with second observer requirements. Cost increases will be associated with increased staffing for data quality control and processing, additional training classes for observers, additional observer sampling equipment to acquire scientifically accurate and statistically reliable catch and bycatch data, and additional travel costs associated with providing field support. FMA costs are expected to increase by about $133 per observed fishing day (NMFS 2010a: 183; NMFS 2009: 182-183).[48] Over the years 2004 to 2010, vessels fished an estimated 150 days a year, thus, total estimated costs to the FMA are estimated to be about $20,000 per vessel, and, assuming 33 vessels, about $658,000 per year for the fleet.

Table 15 summarizes the initial year installation, and the subsequent year annual, cost estimates for this alternative. Potential present values of observer coverage requirement were discussed above.

Table 15 Summary of initial and annual costs for increased observer alternative (Alternative 3) for an individual vessel

Cost	Quantitative estimate, if any
Cost of observer sampling station	$0 to $10,000
Cost of platform scales for observer sampling station	$0 to $20,000
Initial certification costs	$0 to $100
Electronic logbook	$200
Subtotal of initial installation costs	$200 to $30,300
Annual inspection and certification costs	$0
Annual maintenance and repairs	$0 to $500
Cost of second observer	$35,000 to $78,200
Non-monetaized costs	Possible increment in observer costs for lead level 2 qualification. See Section 1.3.4.
Subtotal of annual costs	$35,000 to $78,700
Notes: Rounded to nearest $100.	

A reasonable low end cost estimate for installation on a single vessel is about $200 and a reasonable upward estimate is about $30,300 (Table 14). Few vessels are expected to come in at either the lower or the upper end. The lower end of the range implies a potential installation cost of about $6,600 for 33 vessels, while the upper end implies an installation cost of about $999,900. The range of costs is extreme, and few vessels are likely to find themselves at the extremes.

Ongoing annual private costs (from Table 15), after the first year of the program, are estimated to be about $35,000 to about $79,000. For a fleet of 33 vessels, this implies a range from about $1,155,000 to about $2,597,000 a year. Aggregate fleet costs will be lower if vessels withdraw from the fleet as firms

[47] This assumes 15 vessels already have stations and that 18 acquire them. Costs for inspections are described in Table 12 and Table 13.

[48] These costs are estimated by dividing the FMA's budget by the number of observed fishing days. This estimate is somewhat high, because it includes some fixed as well as variable. Since about 90 percent of FMA's costs are for labor, and most of this is associated with the time required for training, debriefing, and otherwise supporting observers, since a significant part of FMA's non-labor costs are associated with the numbers of observers (for instance, it costs about $1,600 to equip a new observer), and since the FMA budget only includes a part of the building space occupied by the FMA, this bias is believed to be limited. The estimate of $133 was used in a similar way in the analysis of the observer restructuring program (NMFS 2010a; Loefflad, pers. comm., August 31, 2011).

rationalize their businesses under the cooperative's catch sharing arrangements. However, note that this estimate does not include repair costs, potential efficiency costs or benefits, the impact of depreciation on tax payments, or the interest costs on any debt incurred.

These costs will occur through time. The present values of these costs to the fleet have been estimated by approximating the future annual expenses as a perpetuity that must be paid, starting in the second year of the program, and adding them to the first year costs. The present values were estimated using real discount rates of 3 percent and 6 percent (the approach is explained in footnote 39). At a 3 percent discount rate, the present value for a vessel ranges from about $1,133,000 to about $2,577,000, and at a 6 percent discount rate, the present value for a vessel ranges between about $551,000 to about $1,268,000.

These do not include costs incurred by NMFS. Summarizing the costs described earlier, total agency costs are estimated to be between $38,000 and $108,000 for the first year, and about $662,000 per year thereafter. Using the 7 percent real discount rate recommended by the federal Office of Management and Budget for present value calculations in cost benefit analysis[49], these expenditures have a present value of about $8.9 million.

1.3.3 Alternative 4: Scales or second observer (preferred alternative)

Under Alternative 4, prior to November 1 each year, the owner or operator of a vessel subject to the regulations can choose to select either a scales, or an increased observer coverage, monitoring option. If the owner or operator of a vessel that is not opting out of the program for the year does not make a selection, the vessel will be subject to the increased observer coverage option requirements. The selection would be made on a form supplied by NMFS. Vessels will not be allowed to switch between monitoring options within a year. Thus, if the owner or operator of a vessel selects the motion compensated scales option for 2015, prior to November 1, 2014, then that vessel would only be allowed to use the motion compensated scales option throughout 2015.

The preferred alternative provides owners and operators two different ways to meet monitoring and enforcement objectives. A vessel whose owner or operator selects the scales option would be subject to the requirements of Alternative 2 to this action, while a vessel whose owner or operator selects the increased observer coverage option would be subject to the requirements of Alternative 3.

The discussions of Alternatives 2 and 3 in Subsections 1.3.1 and 1.3.2 described the costs associated with the scales and the increased observer options; that discussion is not repeated here. Each operation would be free to choose the approach that minimized its costs and maximized the present value of its fishing profits. Anecdotal information from industry representatives indicates that most operations are expected to choose the scales option. (Down, pers. comm., July 7, 2011)

This analysis suggests two reasons why many vessels may tend to select the scales, rather than the additional observer, option. First, as discussed earlier, some members of this fleet believe that observer estimates tend to overstate the volume of Pacific cod being harvested. Under these circumstances, vessel owners may believe that they will be able to harvest more Pacific cod for a given cooperative catch share with the scales option than with the observer option.

[49] "Constant-dollar benefit-cost analyses of proposed investments and regulations should report net present value and other outcomes determined using a real discount rate of 7 percent. This rate approximates the marginal pretax rate of return on an average investment in the private sector in recent years. Significant changes in this rate will be reflected in future updates of this Circular." (U.S. OMB 1992) One may observe that, while OMB has not revised this recommendation, a 7 percent real discount rate has not approximated the marginal pretax rate of return on an average investment in the private sector for upwards of a decade.

Second, the analysis in the preceding sections indicates that, for many vessels, the scales approach will be less expensive than the observer approach. A firm deciding which approach to choose would consider the differences in initial installation costs, as well as the differences in on-going operational expenses in subsequent years. Figure 6 in the section on Alternative 3 sheds some light on this. Parts (c) and (d) of the figure show the distribution of present values for the second observer options.

These parts of the figure also provide information on the estimates of the range of present values for Alternative 2, the scales alternative. These estimates, which were calculated in Section 1.3.1 of the analysis, have been superimposed in parts (c) and (d) in the form of vertical lines in each part, showing the upper and lower bounds of the estimates. Because of the approach taken to estimating costs in that section, it is not possible to provide more detailed information about the potential range of costs for this alternative.

As shown in parts (c) and (d), the ranges of costs for Alternative 2 tend to overlap the lower part of the distribution for the ranges of costs for Alternative 3. As discussed earlier, the approaches taken to define the ranges for Alternative 2 and 3 tend to generate very wide ranges of estimates or to overstate the numbers of observations falling in the tails of the distributions. Thus, the parts (c) and (d) may tend to overemphasize the extent of overlap. The results of this comparison tend to support anecdotal information about the likelihood that operations will tend to choose the scales option.

The analysis of the two alternatives only provides a rough comparison of costs. Some operations may find that the observer approach is better for their businesses. Operations are more likely to choose the observer option if (a) they expect to leave the fishery soon, and do not want to invest in significant changes to the vessel; (b) they fish relatively fewer days a year; (c) they have already adopted a two observer model, because they have historically fished for CDQ groundfish (notwithstanding the change in CDQ requirements anticipated by 2013); (d) they use a higher discount rate for decision making.

Because differently structured fishing operations may find either scales or observer options more cost-effective, Alternative 4, which provides operations both options, is likely to be more cost effective for industry than either Alternative 2 or Alternative 3.

1.3.4 The lead level 2 requirement

The "lead level 2" requirement

Under Alternatives 2, 3, and 4 (the preferred alternative), all vessels not opting out of the program would be required to carry one fixed gear lead level 2[50] qualified observer at all times while Pacific cod is open to directed fishing in the BSAI, and at all times while fishing for CDQ groundfish.

In order for observers to obtain level 2 qualification, they must have successfully completed NMFS-approved Level 2 observer training as prescribed by the Observer Program, have completed at least 60 days of observer data collection in the groundfish fisheries off of Alaska,[51] and have received an evaluation by NMFS for their most recent deployment that indicated that they met Observer Program expectations for that deployment (§ 679.50(j)(1)(v)(D)). The level 2 training is now included in the basic observer training.

[50] The qualification thresholds for lead status differ from catcher/processor trawl gear vessels, catcher vessel trawl gear vessels, and fixed gear vessels [§ 679.50(j)(1)(v)(E)]. References to "lead level 2" in this section, refer to "fixed gear lead level 2" qualifications rather than trawl qualifications.

[51] Note that the 60-day requirement could be met by shoreside deployments to processing plants.

To become a lead level 2 observer for nontrawl gear, an observer must have completed two observer cruises (contracts) of at least 10 days each,[52] and sampled at least 60 sets on a vessel using nontrawl gear (§ 679.50(j)(1)(v)(E). A cruise is completed when an observer is debriefed. A set is defined in regulations as:

> Set means a string of longline gear, a string of pots, or a group of pots with individual pots deployed and retrieved in the water in a similar location with similar soak time. In the case of pot gear, when the pots in a string are hauled more than once in the same position, a new set is created each time the string is retrieved and re-deployed. A set includes a test set, unsuccessful harvest, or when gear is not working and is pulled in, even if no fish are harvested. (§ 679.2)

On an average fishing day on a fixed gear catcher/processor, an observer samples 3.00 sets, while on an average fishing day on a catcher vessel, an observer samples 2.75 sets.[53] On an average day with an observer on board, an observer samples 2.47 sets on a fixed gear catcher/processor, and 1.87 on a fixed gear catcher vessel.[54] (Narita, pers. comm.; 8/9/2012) At these sampling rates, it would take 20 fishing days on a catcher/processor (or 24 deployed observer days), or 22 fishing days on a catcher vessel (or 32 deployed observer days), to meet the 60 sampled-sets requirement. However, the number of sampled sets per day can vary considerably across vessels, depending on the fishing practices of the vessel (one very long set per day, or multiple shorter sets), or fishing conditions (test fishing may involve more, shorter, sets per day than productive fishing).

Under one scenario, an observer could go from a newly trained novice, without sea experience, to a lead level 2 observer, in a minimum of 74 days, if they completed two 30-day cruises, sampled one set each day they were deployed, and completed two 7-day debriefings. However, observer providers say that, as a practical matter, it currently takes several deployments[55] of 75 to 90 days each for observers to meet the lead level 2 requirements. They report that it takes most observers more than one calendar year to become "lead" certified. (Lake et al. 2011: 1)

In practice, a number of things can increase the length of time it takes an observer to qualify as a lead level 2. Not every day on which an observer is required will be a fishing day, days will be lost to travel or weather; few observers will be taking trips only on fixed gear vessels, observer interests or logistical needs will lead to many or most observers working on trawlers and onshore, in addition to working on fixed gear vessels; time will be lost between trips as observers wait for, or travel to, new assignments; time will be lost between cruises as observers wait to be debriefed or go through debriefing (especially when large numbers of observers need to be debriefed at one time); classes of catcher vessels new to the program (halibut or groundfish vessels under 60 feet) may require more experienced observers, especially in the early years of the program, thus reducing training opportunities on them for new observers; observers will leave the program having fished on fixed gear vessels without having qualified as lead level 2, thereby reducing the number of fixed gear sampling opportunities for persons who do eventually qualify as lead level 2.

[52] There is no requirement that the two cruises be completed on vessels fishing fixed gear.

[53] Where a fishing day is defined as a day on which observed sets are retrieved.

[54] This includes those days before the vessel leaves port, and after it returns, on which an observer is on board. This thus understates sets per day on vessel-trip-day.

[55] "Deployment" in the letter refers to a contract period of 75 to 90 days, which reflects federal regulatory requirements limiting individual observer deployments to a maximum of 90 days [§679.50(i)(2)(viii)(B)].

The marketplace for observers

Fishing operations in federal waters off of Alaska do not hire their own observers directly. There are currently five observer companies certified to provide observers in Alaska. These observer providers contract with individual fishing operations to supply observers meeting the federal requirements. These companies contract with individual observers for this purpose. They deploy the observers as necessary to meet the requirements of the fishing operations. Fishing firms cannot request specific individuals (and are prohibited from discriminating on a number of other grounds, including sex, as well).

This structure creates two separate markets: (1) one in which the observer provider companies hire individual persons as observers; (2) one in which the observer provider companies contract with individual fishing firms to supply observers. These two markets are characterized by larger numbers of parties on one side (qualified observers and fishing firms) and smaller numbers of parties on the other (observer companies). While the small number of observer providers suggests that there are opportunities for the industry to exercise market power, industry participants indicate that firms compete energetically for fishery operation business. The situation is complicated by the diversity of fishing operations with which observer providers contract: some contracts are made with large companies deploying many vessels, and others are made with individual vessels. Moreover a union exists, and for many years observer contracts with several observer providers were covered by union contracts.

In October 2010, the Council recommended Amendments 86 and 76 to the BSAI and GOA groundfish FMPs to restructure the funding and deployment system for the groundfish observer program; NMFS anticipates implementing this action in 2013. The restructured program would add a new funding and deployment system to the existing program, such that operations with less than 100 percent observer coverage would be covered by the new system and operations required to have at least 100 percent coverage would be in the status quo system. While the freezer longline fleet would be covered by the status quo system, it may be indirectly affected by the new system. Under the new regime, observer providers will bid to supply the federal government with observers for deployment in the less than 100 percent fleet; the government itself will supervise the deployment of the observers. The federal government may contract with one or more providers for this service. Compensation for observers deployed by the government will be subject to the Service Contract Act and the Fair Labor Standards Act, which will result in greater daily compensation than is currently paid to observers. The initial coverage rate for the less than 100 percent sector is estimated to be 30 percent; however the actual rate is uncertain as coverage will be funded by an ex-vessel value-based fee such that revenues for coverage will fluctuate with the fishery ex-vessel value. Among the indirect impacts this program may have for the freezer longline sector: (1) higher compensation for observers in the less than 100 percent sector may reduce the number of observers willing to take freezer longline jobs at any given wage rate; (2) expanded coverage requirements in the less than 100 percent coverage sector may also affect the supply to the freezer longline sector; (3) increased observer activity on fixed gear vessels in the less than 100 percent coverage sector may increase the annual number of persons meeting the lead level 2 qualification threshold (described below).

Anecdotal information from industry observers indicates that many observers find freezer longline work relatively less desirable than some other types of observer work. The vessels take relatively long trips, and a single observer must often work long shifts, with little or no sleep, often relatively exposed to the weather, to meet the requirements of random sampling schedules prepared in advance. Trawl catcher/processors carry two observers, making it possible to meet observing needs with fairly regular 12-hour shifts; catcher vessels take much shorter trips and involve more shoreside time; work in processing plants is also more regular. That said, personalities differ, and some persons may find freezer longline observing work relatively desirable; they may, for example, find that the diversity of species brought up by longline gear makes for more interesting work.

Anecdotal information, and at least one publically available observer contract, indicates that, in general, while observers may be paid more for more experience, they are not paid more for a lead level 2 qualification. Moreover, anecdotal information suggests that observer companies do not charge fishing firms more for either experience or lead level 2 qualifications in their observers. The letter from the observer companies, and additional anecdotal information, indicates that it can sometimes be hard to obtain sufficient lead level 2 observers for freezer longliners. Since the cost of preparing a lead level 2 is greater than for a less experienced observer, because their responsibilities can be greater, and since there is difficulty in filling positions, it is not clear why lead level 2 observers do not receive higher wages than other observers, and why firms are not charged more for their services. An individual with one observer firm has suggested that this reflects past perceptions that lead level 2 work and responsibilities are not significantly greater than those for other observers, and that it may be considered unfair to pay two, apparently similarly situated, observers differently. If so, different pay rates could create concerns among observers, and personnel difficulties for observer providers.

Alaska Region practice is to require lead level 2 observers in new quota share programs

Since 1999, NMFS has consistently required lead level 2 observers on catcher/processors in new quota share programs in the Alaska Region. These requirements have been introduced in the CDQ Program (63 FR 30381; June 4, 1998), the Pollock Fishery AFA Program (67 FR 79692; December 30, 2002), the Amendment 80 Trawl Program (72 FR 52668; September 14, 2007), the GOA Rockfish Pilot Project (71 FR 67210; November 20, 2006), and its successor Rockfish Program (76 FR 81248; December 27, 2011).[56] Catcher/processors in all of these programs are required to carry two observers, one of whom has the training and gear-specific experience to qualify as a lead level 2.

The level 2 and lead qualifications were introduced on the basis of NMFS' experience with the CDQ Program in the 1990s, which demonstrated the need for minimal standards of observer experience in quota share fisheries. Under quota share programs, fishing operations can only increase their harvests of target species by purchasing or acquiring additional quota share, or by increasing the volume of fish taken with the quota share they hold. Operations can only increase the volume of fish taken with existing quota share by misreporting, or misleading or intimidating observers. NMFS has found that the experience of lead level 2 observers, and the skills and confidence that go with it, help address potential problems.

NMFS believes that at least one observer should be lead level 2 qualified in the freezer longline fleet as well. This is the case whether the scales alternative, the two-observer alternative, or the alternative giving fishing vessel operators their choice of scales or two-observers, is chosen. Although this quota share program is the result of a private contract among vessel operators, it creates the same concerns with respect to accurate accounting for catches that are found in the programs created by the Council. As discussed elsewhere in this section, sampling in this fishery can be challenging, because of the difficult conditions, and the diversity of species caught by longline gear. The alternatives or options under which only one observer is present place increased responsibilities on that observer, and make the lead level 2 qualification even more important.

Experience is necessary under the two-observer approach

Observer quality affects data quality, which in turn influences fishery management decisions based on those data. NMFS needs high quality data for management in quota share programs and observer

[56] The halibut and sablefish IFQ programs were introduced before 1999, and lead level 2 requirements have not been introduced into those fisheries. No observers have been required in the halibut fishery. The revised Rockfish Program adopted existing lead level 2 requirements, so the rule cited does not reference the lead level 2 requirement.

experience is important to help reduce the potential for data loss. The presence of at least one observer with the experience and confidence associated with lead level 2 qualifications will be important under the two-observer approach, for several reasons: (1) it treats similarly situated operations (trawl and longline catcher/processors) in quota share programs similarly; (2) it will reduce the time required for observers to get "up to speed" with respect to sampling on a new longline vessel assignment; (3) lead level 2 observers are more likely to have the experience and confidence to identify efforts to create misleading data, and to stand up to challenges to observer-collected information; (4) requiring that one of the observers has lead qualifications provides for better organization among the observers on the vessel, and allows for mentoring of the less experienced observer during a cruise.

Concerns raised when quota share systems create incentives for operators to try and circumvent measurement systems can be addressed in part by the deployment of observers with more experience at sea, and with specialized experience with the gear being deployed. The lead level 2 requirement for one of the observers under the two-observer approach, treats the catcher/processors in the freezer longline fishery in the same way as the catcher/processors in the other quota share programs operating in the Alaska Region are treated. The quantity of fixed gear experience embodied in a lead level 2 in the longline fleet is an important variable, and is discussed below.

Performance issues with new observers can impact NMFS' monitoring of scale performance, of halibut PSC estimates, of halibut PSC viability, and of all discard estimates, including Pacific cod. All these factors are important in determining the voluntary cooperative's Pacific cod allocation and halibut PSC allowances. The level 2 requirement ensures that observers have observing experience; in this fishery, the "lead" requirement ensures that they have experience at sea, and with fixed gear, and that, having taken at least two deployments, they are likely to have experience with more than a single operation. Observers with experience of the vessel layouts and operational approaches of different operations should be able to adapt more quickly to vessel-specific conditions when assigned to a new longliner. New observers, or those with little experience aboard a fixed gear vessel, may need to take a few sets to observe vessel operations on a new assignment, and to determine the best sampling techniques for the vessel, before beginning to collect samples. Even after these observers have begun collecting samples, it may take several weeks, or even until their first mid-cruise debriefing, before they become proficient with the best sampling technique for that specific vessel. These factors could lead to unsampled sets, or to lower data quality. Observers with experience aboard a fixed gear vessel will be more likely to be able to begin collecting quality data as soon as they board the vessel.

Quota holders have an operation-specific incentive to maximize the harvest associated with their limited quota, and thus to manipulate the system to do so. Quota holders can do this by pre-sorting, manipulating the sequence of sets so as to lead the observer to sample unrepresentative sets, and by questioning data collected by the observer. NMFS has observed increases in observer statements of potential intimidate/interfere violations in the freezer longline sector in recent years, from four in 2008 to 13 in 2011. There were a total of 37 statements in this period. (Lagerwey, pers. comm., December 28, 2011, citing NORPAC data[57]). NMFS believes that, at least partly as a response to the new cooperative arrangements, managers are becoming more interested in haul-by-haul observer data and samples in the freezer longline sector. As a result, some skippers are placing direct pressure on observers to change sample numbers, sample more, sample less, or sample differently. This has been a long-term problem in the Amendment 80 and AFA catcher/processor fleets. However, the freezer longline fleet is an increasing area of concern. (Lagerwey, pers. comm., December 28, 2011). Observers with more experience are more likely to be able to identify actions that lead to the sampling of unrepresentative sets, to be more confident in their sampling decisions, and less susceptible to pressure.

[57] The NORPAC data base is the data base in which the at-sea observer data is consolidated.

Finally, the presence of a lead level 2 observer on board the vessel provides for better organization of sampling. While sampling duties will be similar between the two observers, the lead level 2 observer will be the liaison between the vessel observers and NMFS, will be responsible for determining whether any impediments to sampling exist, and will be responsible for resolving problems with sampling or data collection. The lead level 2 observer will be responsible for ensuring complete and correct data and will carry this responsibility through the debriefing process. The second observer will be able to learn the techniques to become a successful observer aboard a longline vessel.

Experience is also important under the scales approach

If the scales alternative, or Alternative 4, providing for either scales or two-observers, is chosen, this will be the first quota share program since 1999 in which only a single observer may be required. While the scales will facilitate measurement of the volume of retained Pacific cod, the scales approaches, with their single observer, are untested, and NMFS believes that, to minimize potential problems, the single observer should be a lead level 2, as they are more likely to have the skills necessary to deal with unexpected issues concerning sampling and data collection.

Unless all sets are sampled, observer protocol requires random selection of which hauls to sample. This sampling regimen can be very demanding and involve erratic sleep schedules over long periods of time. More experienced observers are better adapted to this lifestyle and can continue to perform their duties adequately over a longer period of time. If the scales approach is used, the only source for Pacific cod discard, and halibut PSC mortality estimates, will be from the single observer aboard the vessel. A lead level 2 observer is more likely to be able to quickly and independently determine the best methods for collecting these two important sources of data. Observers with little or no experience aboard a longline vessel are unfamiliar with vessel operations and layouts that could affect the ability to correctly collect this essential information to provide discard estimates and halibut PSC mortality.

In all other catch share programs, two observers, one of whom is a lead level 2 observer, monitor scale performance. In this program, only one observer will be aboard if the scales option is chosen. The scale location and process for weighing will be very different in this program. Unlike other catch share programs, where observers are working within view of the scale, it is likely that the scales aboard a freezer longliner will be in an area away from where the observer normally works. The alternatives include a provision for video monitoring, but, the video will not be monitored in real time, and an observer that is unfamiliar with fixed gear operations will have a difficult time determining if the scale is being used correctly and that no scale fraud is occurring. An observer with more experience will be more likely to address issues with scale performance with the responsible vessel representatives prior to disembarking the vessel.

How much experience is necessary?

All of the alternatives in the current action include a provision to reduce the sampled set threshold for fixed gear "lead" qualification from 60 sampled sets to 30 sampled sets. The 60 sampled-set requirement was put into place in 1999 for the CDQ fixed gear program (63 FR 30381; June 4, 1998). At that time, most observer experience was gained on longline catcher/processors conducting multiple sets each day, and making relatively long trips of up to 45 days. The majority of these trips were directed fishing for Pacific cod and there was little variability in the sets (length, soak time, species encounters). Sixty sampled sets was thought to be appropriate to ensure that lead level 2 observers were proficient in all the sampling duties required aboard a fixed gear vessel, and confident in their ability to adjust to changing circumstances aboard the vessel. (Loefflad, pers. comm., 2011)

After 12 years, and thousands of deployments, the agency has learned that observers can gain the level of experience necessary for lead level 2 observers with 60 days of observer data collection, two contracts of at least 10 days each, and 30 sampled freezer longline sets. (Loefflad, pers. comm., 2011)

NMFS expects this to remain the case in the future, if most observers are obtaining their lead experience on fixed gear catcher vessels. Currently, in the Bering Sea, the only longline fleet required to carry lead level 2 fixed gear observers is the freezer longliner fleet targeting Pacific cod. This fleet requires one of the most straightforward sampling strategies of all potential fixed gear deployments. Under the restructured observer program, the majority of observer experience in the less than 100 percent category will be obtained on fixed gear catcher vessels. These vessels conduct fewer sets than the vessels in the freezer longline fleet, but involve more challenging sampling situations to which successful observers must adapt. Small longline catcher vessels vary considerably in their vessel layouts, gear setting, and hauling techniques. They may target a variety of species during one trip. The limited space requires creative solutions by the observer. All of these factors provide an observer with more experience in a given number of sampled sets than would be received aboard a freezer longliner targeting Pacific cod.

NMFS maintains that the other existing requirements for lead level 2 qualification are necessary. Sixty days of observer data collection ensures that the observer understands the basics of the observer duties. Requiring observers to complete at least two cruises ensures that the observer has almost certainly served in at least two different observing situations and has had experience adapting sampling strategies to these different situations. Each cruise or contract must be at least 10 days in length, so that the observer has enough time adapt to a specific situation, and to ensure that vessels complete true sets and do not conduct "observer sets".[58]

Demand for "lead" level 2 qualified observers in the BSAI freezer longline fleet

In the past, only freezer longliners fishing for CDQ were required to carry lead level 2 observers. As noted earlier in this analysis, this may have been 15 to 19 vessels a year (Table 6). Currently, NMFS estimates that there are 208 observers who qualify for lead level 2 status; over the 2010–2011 period, 39 of these observers served as lead level 2s on a freezer longliner (Narita, pers. comm., 11/28/2011). The divergence between the number of qualified observers in 2011 and the number used in 2010–2011, may only reflect the limited number of positions required to meet the CDQ requirement in 2010 and the "A" season in 2011.

The requirement that CDQ vessels carry lead level 2 observers ended, effective May 31, 2011, with a policy letter issued by the NMFS Alaska Regional Administrator (Balsiger, 5/31/2011). NMFS has published a proposed rule to place this policy in regulation (75 FR 39892, July 13, 2010) and is preparing a final rule for this action (Bibb, pers. comm., 12/05/2011). Thus, at this time, and through 2012, there will be no demand in this fleet for lead level 2 observers.

Under all but the status quo alternative, all vessels will be required to carry a lead level 2 observer at all times when fishing in the BSAI or GOA while the fishery for Pacific cod is open in the BSAI, or when fishing for CDQ groundfish. It is likely that the fishery for Pacific cod will be open almost all year.

[58] "Observer" sets are conducted when a vessel needs to obtain observer coverage, but wants to keep the observer aboard for the minimum amount of time. These sets usually have very short soak times, often do not use bait, involve a vessel that fishes close to port in areas that are not traditional fishing locations, and rarely keeps the fish, if anything is caught. Observer sets do not provide the observer with the representative experience needed for a fixed gear type.

The September 27, 2011, letter sent by the five observer provider companies provides an analysis of the demand for lead level 2 qualified observers. Under the program, the companies expect to see much of the fleet fishing 9 to 12 months a year. Since many of these boats make 30 to 40 day trips, the contractors' experience is that individual observers can make, at most, two trips without violating their 90-day limit.[59] A single freezer longliner, therefore, will need four to six observer deployments for a year of coverage. With 32 vessels in the fleet, this implies up to 200 individual lead level 2 deployments a year (the authors appear to have rounded up from 192 deployments). (Lake et al. 2011: 2) Assuming that each observer takes two trips per deployment, and only take one deployment, this is equivalent to 200 persons.

Based on fishing experience in the fleet in 2011, the first full year of fishing under the cooperative's quota share program, this analysis may incorporate assumptions that lead to an overestimate of the number of observers required. An examination of records of fishing activity in 2011, the first complete year of operation by the cooperative, shows 30 active vessels, fishing during a total of 1,138 weeks. The median vessel fished for 38 weeks, and the number of weeks during which an individual vessel fished ranged between 21 and 51 separate weeks.[60] The number of observer days may be approximated by assuming vessels fished on each day in a week in which fishing took place. This will provide an upper bound to the total number of days, because vessels would not have been active on each day in each of these weeks. This approach generates a total of 7,966 observed days, or 266 observed "standardized" 30-day fishing trips. Assuming each observer fished two trips, the fleet would have required 133 individual observers.

Table 16, below, provides estimates of the number of observers that would be required under different assumptions about potential average fishing time, and about numbers of vessels remaining active in the fishery.

Table 16 Estimates of the number of observers required per year

		Average number of days fishing		
		180	270	360
Number of vessels	25	75	113	150
	33	99	149	198

Notes: Each cell in this table assumes the number of vessels and the average number of days fishing that is shown. The table assumes that freezer longline trips last 30 days, and that each observer takes two trips on a freezer longliner a year. For comparison, in 2010, observers took an average of 1.87 cruises (a cruise is a series of trips, taking not more than 90 days, and ending in a debriefing, and would not generally include more than two 30-day freezer longliner trips); each cruise involved an average of 52.08 coverage days.

The development of a cooperative based fishery is expected to lead to changes in the duration of fishing and the number of vessels participating in the fishery. This makes accurately estimating observer demand in the future difficult. The current analytical approach depends on strong assumptions about the number of trips each observer will take in a year, and about the number of trips that firms will require. Both of these factors may be affected by changes in market compensation for observers, as will be discussed later in this section. It seems more likely that the number of observers required will reflect the central part of the range (perhaps from 110 to 150 observers) than that it will reflect the extremes (which assume significantly lower numbers of vessels, and significantly higher average days per vessel, than there were in 2011).

[59] The 90-day limitation is a result of regulation at § 679.50(i)(2)(viii)(A) and (B) that require that, unless alternative arrangements are approved by the Observer Program Office, an observer provider must not deploy an observer on the same vessel or at the same shoreside or stationary floating processor for more than 90 days in a 12-month period or deploy an observer for more than 90 days in a single deployment.

[60] This was an increase of about 24 percent over the total number of weeks fished by the vessels catching Pacific cod in 2010. The reason for this change is not clear: vessels may have reduced fishing rates to take account of the opportunities offered by the cooperative, or this may have been a response to the increased TAC in 2011.

Supply of "Lead" level 2s to the BSAI freezer longline fleet in the short run

Observer program records indicate that in November 2011, 208 observers met the requirements for a lead level 2 certification. This is approximately equal to the upper bound of the annual demand range, described above. However, the observer program has not had to provide this many lead level 2 observers per year in past years. As noted elsewhere, both a freezer longline representative, and the October observer provider letter, indicate that the industry has found it challenging to meet previous lead level 2 requirements. Of the 208 qualified observers, observer program records indicate that only 39 served as lead level 2 observers in the freezer longline fleet in 2010 and 2011. A review of observer program records indicates that, if the sampled sets requirement was reduced from 60 to 30, as proposed under this rule, there would be 250 lead level 2 qualified observers available in late 2011.[61]

As a first approximation, in the absence of any reason to expect more or fewer opportunities for gaining lead level 2 qualifying sampled sets and cruises in 2012, there may be about 250 persons with lead level 2 qualifications when the monitoring and enforcement program becomes effective at the start of 2013.[62] This is more than would be needed in 2013, as discussed in the previous section. However, in the past the observer program has not had to identify and mobilize more than a small number of the available lead level 2s, and according to reports, it has only been able to do so with difficulty. There are many other demands for observers, there are logistical challenges associating with matching qualified observers to positions, and with the introduction of the observer restructuring program at the same time in 2013, and there are uncertainties associated with the new market situation.

After 2013, the supply of lead level 2 observers will come from (1) fixed gear catcher/processors, and (2) fixed gear catcher vessels. Most of the catcher/processors are longliners, although there are a few that fish pot gear. Catcher vessels include longline and pot vessels.

Long-run supply from fixed gear catcher/processors

Anecdotal information, and the cost estimates summarized elsewhere in the RIR, suggest that almost all of the catcher/processors would choose the scales option, if given a choice, as they would be under the preferred alternative (Alternative 4). Vessels operating under this option would have to carry a single, lead level 2 qualified observer. However, if all the vessels subject to this action choose this option and operate this way, no observers would be able to earn lead level 2 qualifying experience within this fleet.[63] [64]

Pot catcher vessels would not be required to carry a lead level 2 observer. But, since there are relatively few pot catcher/processors, few observers are likely to be able to obtain lead level 2 qualifying experience in this sector. Observers could also gain lead level 2 experience on freezer longliners that only fish in the GOA, or any vessels that choose to "opt out" of the program and target only Greenland turbot or IFQ halibut or sablefish. However, these are also not likely to be a significant source of observers.

[61] Estimates of the numbers of observers under the different qualification standards, and of the number serving, are based on estimates of the number of observers completing deployments within the period of January 2012 through November 2011, who had completed the requisite number of sampled sets since 2000.

[62] This assumes that persons continue to qualify at current rates, and that current attrition rates hold in the next year as well.

[63] The observer companies made this point in their September letter to the Council (Lake, et al. 2011).

[64] Except when the vessel was fishing while the Pacific cod fishery was closed for directed fishing in the BSAI. However, in the future, under the cooperative's management, it is likely that fishing will remain open almost all of the year.

So far, this discussion has assumed that freezer longliners operate without regard to the potential for a shortage of lead level 2 observers to constrain fishing and reduce the potential profits from cooperative fishing arrangements. It is possible, however, for the cooperative to arrange for its members to compensate some vessels to carry an observer in addition to the lead level 2, and the observer could thus obtain sampling experience needed to qualify for a lead level 2 position. At the rate of 2.9 sampled sets per day for observers in fixed gear catcher/processors, it would take about 12 days at the 30 sampled-sets threshold incorporated into the preferred alternative to move from level 2 to lead level 2, assuming this was not the first fixed-gear deployment for the observer.

Vessels may take additional NMFS-trained observers, voluntarily within the regulations, and the agency will be able to use any data that is collected by these observers after they have successfully been debriefed. Vessels in the AFA pollock fleet and the Northwest hake fleet have taken additional observers in the past to increase the data quality that would have been provided by one or two observers. Similarly, freezer longline vessels have taken extra observers, and sought lead observers, to monitor halibut PSC in the GOA fisheries.

Long-run supply from fixed gear catcher vessels

Going forward, fixed gear catcher vessels will be an important source of lead level 2 qualified observers. The observer restructuring program will increase the proportion of the groundfish catcher vessel fleet that will be required to carry observers, and will extend the coverage requirement to the large, and presently unobserved, halibut IFQ fleet. However, while this will also increase opportunities for acquiring lead level 2 qualifications, it will also increase the requirements for observers in general. Because of program provisions that are expected to increase observer compensation paid by the less than 100 percent sector, this may increase the relative attractiveness of working in this sector, as opposed to other operational segments of the industry. Note that the observer restructuring program, by increasing wages among vessels in the less than 100 percent sector, will also put upward pressure on wages in the 100 percent sector.

The Observer Restructuring analysis contains estimates of required observer days for different fleet segments, assuming 30 percent coverage (Council 2010a). Some of these are summarized in Table 17.

Table 17 Observer requirements for selected groundfish and halibut fleet sectors, as reported in the Observer Restructuring Analysis

Fleet segment	Number of observer days required
Sablefish IFQ CVs >= 60’	344
Sablefish CVs 50–59.9’	385
Sablefish CVs 40–49.9’	101
Sablefish CVs < 40’	30
Halibut IFQ CVs	5,904
Catcher vessels >=60’ Fixed gear	595
Catcher vessels 50’–59.9’ Fixed gear	706
Catcher vessels 40’–49.9’ Fixed gear	299
Catcher vessels < 40’ Fixed gear	169
Note: based on data for 2008. Source: Observer Restructuring Analysis (Council 2010a: A-73, Table 11-6).	

Obviously, several sectors (i.e., those using trawl gear) will not provide opportunities for sampling longline or pot sets, and therefore have not been included in Table 17. Moreover, there is an unknown amount of duplication between the halibut IFQ sector, and the groundfish catcher vessel longline sectors.

While the observer restructuring program authorizes NMFS to require observers on catcher vessels under 40 feet, this will not be an initial part of this program. For these reasons, the next table, Table 18, focuses exclusively on the groundfish catcher vessel fixed gear sectors over 40 feet, and provides estimates of the number of observer days required in each sector, and of the maximum number of lead level 2 qualifications that might be provided in a year from each.

Table 18 Maximum number of fixed gear "lead" qualified observers produced per year in selected groundfish catcher vessel fleet sectors

Vessel class	Number of observer days required in the BSAI and GOA	Number of sampled sets (@1.87/day)	Maximum number of "Lead" qualifications (@30 sampled sets/qualification)	Maximum number of "Lead" qualifications (@60 sampled sets/qualification)
Catcher vessels >=60' Fixed gear	595	1,113	37	18
Catcher vessels 50'–59.9' Fixed gear	706	1,320	44	22
Catcher vessels 40'–49.9' Fixed gear	299	559	18	9
Source: Summarizes information in Table 17 in this document.				

The maximum number of newly qualified observers each year would be 99. This is an upper bound estimate of potential new "lead" level 2 observers, because it assumes that each person works on the catcher vessels only so long as necessary to acquire the "lead" status, and then leaves, while the position is taken by someone else who also stays only so long as needed to acquire the status. As explained earlier, in practice a wide range of practical logistical considerations will reduce the numbers of new annual observer qualifications below the number calculated from the table.

While this calculation, applied to the fixed gear groundfish catcher vessels, tends to overstate the number of observers that might be generated from this fleet segment, it also ignores the potential supply of observers from the halibut IFQ fleet. An alternative analysis has been prepared for this RIR using a data set on catcher vessel fishing trips taken in 2010, prepared from eLandings data. This data set integrates data from groundfish and from halibut trips. The results of this analysis are summarized in Table 19.

Table 19 Estimated maximum numbers of fixed gear "lead" qualified observers produced by year in groundfish and halibut catcher vessel fleets for vessels 40 feet LOA or greater

Month	Trip fishing days	Observed days	Sampled sets	max lead certs
Jan	1,722	516	966	32
Feb	794	238	446	14
Mar	1,254	376	704	23
Apr	1,937	581	1,088	36
May	3,168	950	1,778	59
Jun	2,528	758	1,419	47
Jul	2,045	613	1,148	38
Aug	2,257	677	1,267	42
Sep	2,869	860	1,610	53
Oct	2,024	607	1,136	37
Nov	782	234	439	14
Dec	16	4	9	0
Grand Total	21,396	6,414	12,010	395

Notes: "Trip fishing days" for an individual trip is equal to the delivery date minus the fishing start date, plus 1, for trips that start and end on the same day, and to the delivery date minus the fishing start date for other trips. Fishing start date is the date the vessel is reported to have begun fishing, not the day it left port. Column shows total over all trips. "Observed days" is equal to 30% of the "Trip fishing days." Sampled sets is equal to the product of the "observed days" and 1.87 sampled sets per observed day (which may include days with observer coverage prior to and after the trip). "Max lead certs" is equal to the number of "sampled sets" divided by 30. Data set includes some deliveries for trips from State of Alaska GHL fisheries that won't be part of the observer restructuring program; the number of these trips is believed to be small.
Source: AKR eLandings data.

This table shows a "theoretical" maximum of 395 lead level 2 observers created each year in the catcher vessel fleet. As explained before, this is a "theoretical" maximum, calculated ignoring the factors which would reduce the actual number in any year. The actual number would be a fraction of this, and that fraction, while its size is hard to predict, could be quite small, perhaps well under half.

Table 19 is based on the assumption that the observer program will achieve the target 30 percent coverage of the relevant fleet of catcher vessels. Funding issues may preclude the achievement of 30 percent coverage for one or more years. Figure 7 shows the estimated maximum number of observers earning a lead level 2 qualification per year for different assumptions about the level of observer coverage among fixed gear catcher vessels. In each instance, the estimates are maximums, for the reasons discussed above.

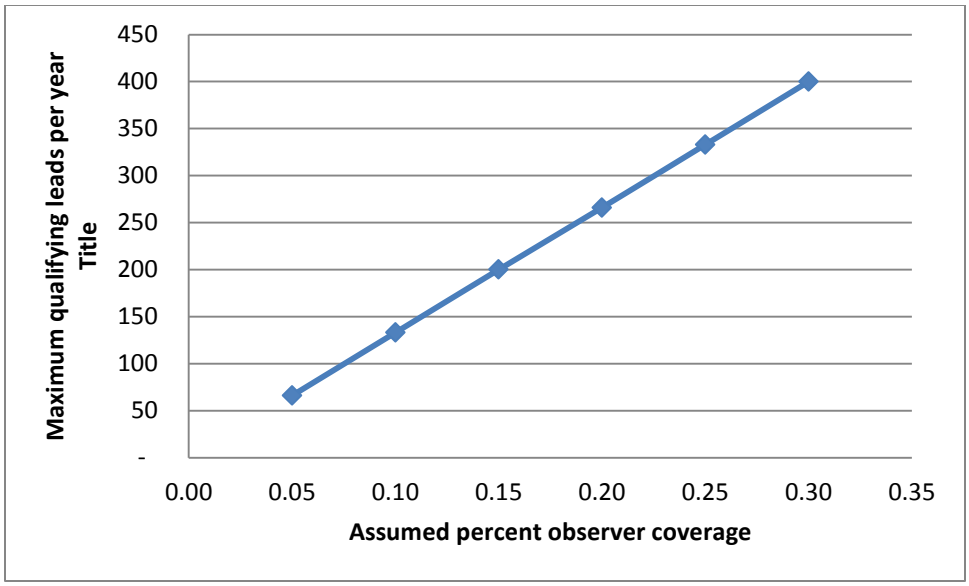

Figure 7 Maximum qualifying lead level 2 observers per year for different assumptions about the level of observer coverage among fixed gear catcher vessels

Lead level 2s from several annual cohorts of new lead level 2 qualified observers will be available at any one time. However, lead level 2s will also be leaving the observer pool as they move on to other occupations. Observer attrition is high. The following table shows equilibrium numbers of observers in the observer pool assuming that 100 observers qualify for lead level 2 work each year (this is about 25 percent of the theoretical maximum with 30 percent coverage, and about equal to the theoretical maximum at 7.5 percent coverage), and attrition per year is 50 percent.

Table 20 Long-run equilibrium numbers of fixed gear "lead" qualified observers with 100 recruits per year, and 50% annual attrition.

History of an individual lead level 2 observer cohort		Number of lead level 2 observers per year in long-run equilibrium	
Year	Number of observers in cohort at start of year	Cohort	Size of cohort in long-run equilibrium
1	100	1	100
2	50	2	50
3	25	3	25
4	12	4	12
5	6	5	6
6	3	6	3
7	1	7	1
8	0	8	0
Total number of observers per year in long-run equilibrium:			197
Note: long-run equilibrium refers to a typical year after annual recruitment to lead level 2 status has been at year one levels (100) for at least 7 years.			

As Table 20 indicates, with 100 recruits a year, and 50 percent annual attrition, the number of qualified lead level 2 observers at the start of each year would be about equal to the upper bound of the number required, described above. However, based on the experience of 2010 and 2011, described earlier, the

observer providers do not appear to have had to identify and mobilize more than about a fifth (39 of 208) of the eligible lead level 2 qualified observers in the recent past.

Figure 8 shows the relationship between annual lead level 2 recruit rates and long-run equilibrium numbers of lead level 2s available, for a range of recruitment rates from 50 to 300 persons per year, and for annual attrition levels of 40 percent, 50 percent, and 60 percent.

The Council's motion and the proposed regulations do not preclude several firms at a time from receiving contracts to provide observer coverage for the partial coverage fleet. However, the request for proposals (RFP) issued by NOAA's acquisition and grants office in support of FMA may provide for a single award. The award will be made for a one-year base period and one additional one-year option period, for a maximum performance period of two years. A firm winning a single award may have a competitive advantage over other observer providers in the freezer longline market since it would have the majority of opportunities to deploy its observers on smaller fixed gear vessels to gain the requisite experience for lead level two certification, and observers may tend to be loyal to individual companies. However, observers are able to move between observer providers, and other observer companies are able to bid for their services to supply the freezer longline market.

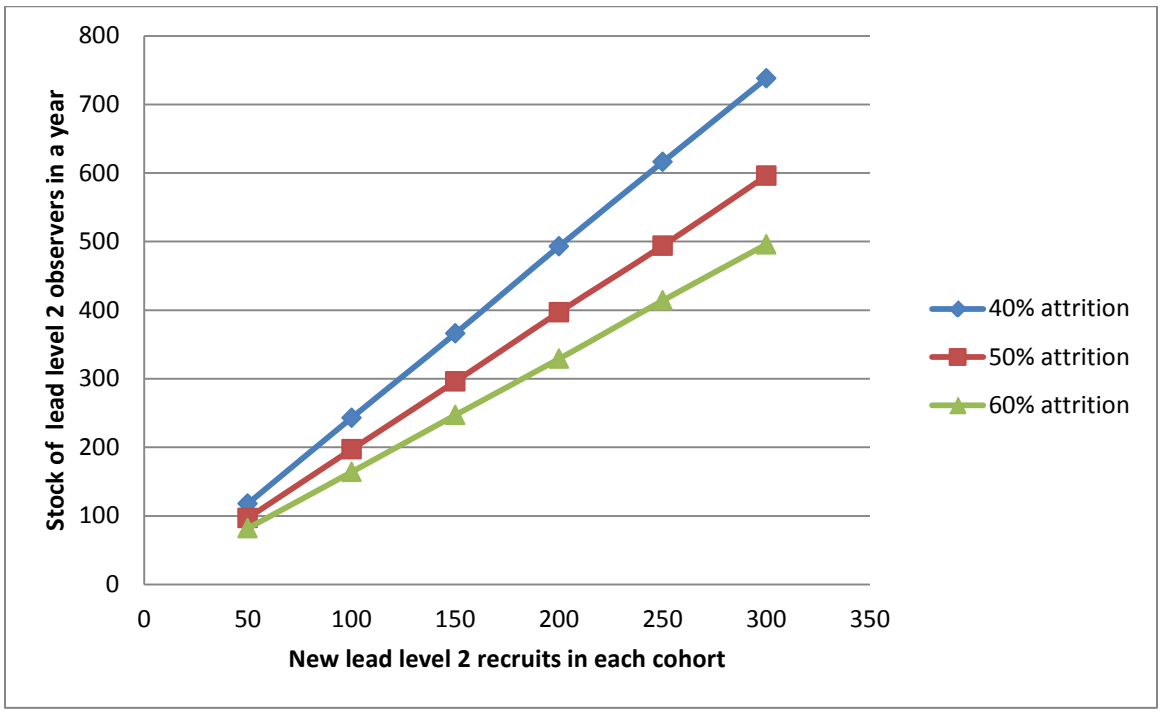

Figure 8 Lead level 2 recruitment and long-run equilibrium quantity of lead level 2 qualified observers. (based on analysis in Table 20; assuming 40%, 50%, and 60% annual attrition).

This discussion is suggestive, rather than predictive: the models are simple and incorporate a number of assumptions, and there are uncertainties with respect to the implementation of the observer restructuring program and the evolution of the freezer longline cooperative. As discussed in the next section, lead level 2 compensation will play an important role through its effect on the numbers of lead level 2 observers demanded and supplied: as compensation rises, the number of lead level 2s demanded by freezer longliners will decline, while the number supplied will increase.

The following discussion, making relatively conservative assumptions, illustrates how the calculations may be modified by changes in compensation. At the 15 percent level of observer coverage in the partial coverage fleet, the model suggests maximum annual recruitment of 200 lead level 2s (Figure 7). If 75 percent of the sampled sets are "wasted," and are not used to qualify observers for lead level 2 status for reasons described earlier, annual lead level 2 recruitment would be 50. With 50 percent attrition, the long-run equilibrium would be 100 lead level 2s (Figure 8). As noted, given the 2011 level of vessel activity, an estimated 149 would be required (Table 16). However, none of these simple models takes account of the impact of compensation on the numbers demanded or supplied. The 149 person requirement was based on an assumption of an average of two 30 day trips per lead level 2 each year; if, for example, increased compensation caused the average number of trips to increase to 2.5, the number of persons required would drop to 119. If, for example, increased compensation led to more efficient use of sampled sets in the partially covered fleet, so that the number of sample sets wasted declined from 75 percent to 65 percent, annual recruitment would rise to 70 persons, and the long run equilibrium with 50 percent attrition would be about 140 persons.

Thus, this discussion suggests that, taking account of the potential for increased compensation for lead level 2 observers, the number supplied is likely to be able accommodate the numbers demanded, because of the operation of the market. There are no certainties, and while it is possible that temporary shortages of lead level 2 observers may occur, markets should respond to eliminate these shortages.
For the purposes of this analysis, the number of qualified lead level 2s is not the appropriate number to compare to the quantity required. After all, as noted earlier, under the current 60 sampled-set requirement there are about 208 persons with lead level 2 qualifications, but anecdotal information indicates that the industry was only able to fill the required 39 lead level positions in 2010-11 with difficulty. In addition to the number of persons with lead level 2 qualifications, it would be desirable to know how many will choose to take a freezer longline position each year.

Increased investment, by observer providers, in "grooming" observers to take lead level 2 positions would be costly to them and to observers. Increased attention would have to be given to fitting available observers into fixed gear slots, complicating logistics, and reducing the numbers of observers for trawl operations. Observer contracts are currently 90-day contracts. Observer providers may be concerned about making this investment in the absence of longer term contracts that would commit observers to taking freezer longline jobs, once they had qualified as lead level 2s. Even if such contracts were written, it is not clear if it would be cost effective to enforce them if observers should change their minds. Observer companies, and fishing firms, are likely to be reluctant to compel observers to fulfill contractual commitments and serve on fishing vessels when they do not want to do so.

The importance of observer wage rates and daily charges to fishing operations

Anecdotal information, and examination of one observer contract template in the public domain, suggests that, while observer companies pay a premium for more experienced observers, they do not charge fishing businesses for greater experience; moreover they do not generally pay a significant premium to observers for lead level 2 qualifications or charge fishing companies more for providing them.

Anecdotal information also suggests that, even in the past, it has been hard to get as many lead level 2 observers as industry wants. For example, the October observer provider letter to the Council indicates that the industry is able to get as many observers as needed, but only after "a great deal of hand-wringing." (Lake et al. 2011:1) As shown in Figure 9, the evidence of a shortage implies that wages

paid for lead level 2 observers are below market-clearing levels, so that it is not easy to get observers to fill these positions.[65]

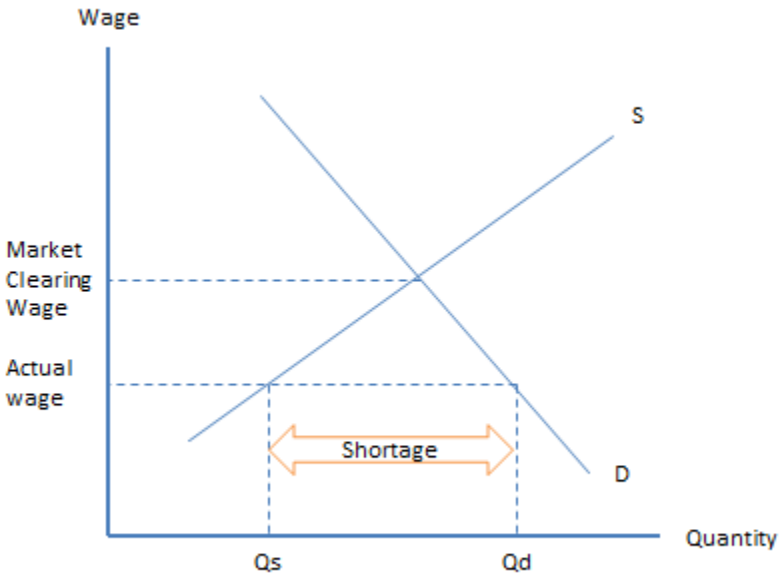

Figure 9 Supply and demand for lead level 2 observers

The industry cooperative is running a quota share program for industry Pacific cod and halibut PSC, providing significant benefits for cooperative members. If the lead level 2 requirement were implemented, it is likely that industry would be forced to bid up the price of lead level 2 qualified observers in order to compensate observer providers for the increased costs of meeting their needs. Part of those increased costs would be created as observers and observer providers incur logistical costs of "grooming" new lead level 2 observers in the fixed gear catcher vessel fleet; another part of those costs would be created as observer providers bid up compensation paid to lead level 2 observers themselves. Thus, the lead level 2 requirement is likely to increase the costs of the required observer coverage under the monitoring and enforcement program, all else equal. It is not possible to estimate the size of this cost increase.

As Figure 9 shows, increases in observer compensation would work to eliminate the lead level 2 shortage in two ways: on the one hand, more observers would find it worthwhile to get the "lead" qualification and work in the freezer-longline fishery (higher recruitment and lower attrition), and on the other, freezer-longline operators would reduce their demand for lead level 2 observers, perhaps by modifying their operating practices by increasing daily fishing rates beyond the levels that would be employed in the absence of this lead requirement. This could be costly to the industry, as they may have to forgo some of the efficiency benefits of the share program.

[65] Figure 3 shows hypothetical supply (S) and demand (D) curves for lead level 2 observers. Since the quantity of observers demanded (Qd) is greater than the quantity supplied (Qs), it is likely that the actual wage paid is less than the market clearing wage.

Although it is not shown in Figure 9, the fishing industry might be able to improve recruitment and retention of lead observers by changes in practices that make it more attractive to be a freezer longline observer. For example, on some vessels it might be possible to improve observer accommodations, or on others additional protection against the weather might be provided for observers monitoring harvests. Vessel size may be a factor limiting the ability to make these changes. To the extent that operators are able to make changes like this, a revised Figure 9 may show the impact as a shift to the right in the observer supply curve (more observers would supply more time at any given price). This would shift the intersection of the supply and demand curves to the right, indicating more observer activity at a lower price. This action by the fishing vessel operators would create costs for them, and would tend to reduce their benefits from the share program.

1.3.5 Benefits of this action

This action creates three types of benefits: (a) it improves NMFS enforcement of Pacific cod catch limits in the presence of a voluntary cooperative catch sharing program; (b) it offers freezer longline representatives increased confidence that NMFS estimates of Pacific cod catch are accurate; and (c) it improves the efficacy of the cooperative's catch share program.

Improved monitoring and enforcement of catches

NMFS uses observer sample data to estimate the weight and number of each species caught by those freezer longliners required to carry observers.[66] The methods used were described in Section 1.2.1. As described there, when only a single observer is present it is not possible to sample all sets, so the data generated from sampled sets are used to estimate the catch of unsampled sets. Since only the data from the sampled portion of the sampled sets on the observed trips is available to estimate catch, vessel crew can bias the catch data to the extent that they can control what the observer samples and when. Attempts to bias the catch estimate may occur in the absence of a cooperative catch sharing program, but the incentives are greater under a catch sharing program.

In a fishery with a race for fish, vessel operators do not have individual quotas, but are each harvesting against an aggregate quota. Harvest share may be increased by increasing fishing effort. However, members of a cooperative have a finite amount of fish they may catch. The only way to increase catch, other than by purchase of quota from other members, is to under-report or find a way to bias an observer's sample data. Thus, because of the financial incentive to under-report certain components of catch, and in the absence of a reliable source of independent information, a self-reporting system is vulnerable to fraud. Operators might also engage in different fishing behaviors on observed and unobserved trips, again contributing to potential under-reporting of catch. Past experience in other quota fisheries has demonstrated that practices such as high grading and under-reporting frequently occur (Council 2007a: 115). For example, operators in the head-and-gut fleet have manipulated estimates of halibut PSC for individual hauls (Council 2007a: 118). The alternatives under consideration in this action are intended to address this problem, by either weighing all Pacific cod, or by decreasing the number of unsampled sets to near zero and reducing the portion of each set that is unsampled.

Under Alternative 1 (no action), it is possible that manipulation of observer estimates could allow this sector to exceed its sectoral allocation of the annual Pacific cod TAC, as set out in the BSAI groundfish specifications. This may have impacts on the Pacific cod stock, on the allocation of fishing resources

[66] Currently, NMFS uses data from vessel derived product recovery to determine total catch aboard freezer longline vessels required to carry observers for 30 percent of the time. However, under the observer restructuring action, all catcher/processors will carry an observer during all of their trips.

among vessels and sectors, and on economic welfare of the public. If the sector Pacific cod catch exceeds the sector allocation set out in specifications, aggregate BSAI Pacific cod catches may exceed the TAC determined by the Council, which is based upon the ABC, set by the SSC, itself based on scientific input from fisheries biologists and the BSAI groundfish plan team. This may create a situation where the normal margin between the ABC and TAC is reduced, increasing the potential for exceeding the ABC. Under these circumstances, the SSC and Council may react by setting more conservative ABCs and TACs. If this happens, the aggregate Pacific cod available to the BSAI freezer longliners would be reduced. Moreover, other fleet sectors would be adversely impacted as well, receiving smaller Pacific cod allocations than they otherwise would.[67]

This may have an adverse impact on future revenues for all sectors targeted BSAI Pacific cod, and adverse implications for the economic welfare of the public. Given the uncertainty about the potential for overages, the impact on Pacific cod stocks, and the Council's response, and lack of information about the nature of the demand curves for Pacific cod, and on harvesting costs, it is not possible to project the size of potential revenue and welfare impacts.

Alternatives 2, 3, and 4 provide enhanced levels of monitoring that are expected to make it possible for NMFS to accurately estimate Pacific cod catches in this sector. They are expected to prevent the losses that might occur under Alternative 1.

Address industry concerns about accuracy of observer estimates

Based on a comparison of production and observer data provided to the Freezer Longline Coalition (FLC)[68] by member vessels, the FLC believes that observers tend to overestimate the amount of Pacific cod harvested. If true, this would mean the fishery could be shut down before it fully harvested its annual allowance. This would reduce industry revenues. (Down, pers. comm., July 7, 2011). The history of this action, described in Section 1.1.5, indicates that this concern was an important motivation for industry to support this action.

NMFS believes that current observer estimates of freezer longline harvests of Pacific cod are accurate. To the extent that the sampled fraction of sampled sets is representative of unsampled catch, and that the weight of sampled catch is estimated accurately, the expanded estimate will be an accurate estimate of the total catch. As the percentage of each set sampled increases, the precision of this estimate increases as well. NMFS uses sampling theory to randomize when samples are taken, and does not have statistical evidence that the methodology produces a biased or inaccurate estimate of catch.

Increasing the number of observers could decrease the number of unsampled sets to near zero, which will increase the precision of catch estimates for individual trips. The scales approach will also be precise, because all Pacific cod will be weighed individually. Based on many years of experience with the trawl fleet weighing total catch at-sea, NMFS expects that the scales and observer alternatives will both increase confidence in the accuracy of estimates of individual vessel Pacific cod catches.

NMFS expects that Alternatives 2, 3, or 4 should reduce industry concerns about these issues.

[67] If the Council took no action, the BSAI Pacific cod TACs and ABCs might be exceeded and future Pacific cod populations and harvests might be smaller than they otherwise would have been. The discussion above assumes the Council anticipates this possibility and reacts proactively to protect the stocks.

[68] The Freezer Longline Coalition (FLC) and the Freezer Longline Conservation Cooperative (FLCC) are different organizations.

Improves efficacy of cooperative's catch share system

This action would tend to improve the effectiveness of the cooperative's catch sharing arrangements. Observer data are received with a lag, and are provisional until the observer is debriefed. Since the original numbers are sometimes subsequently modified, it can be hard for a vessel captain, or a cooperative catch share manager, to determine with certainty when quotas have been reached. Vessels may have to fish for several days without hard estimates of the agency's ultimate estimate of the catch. An industry representative reports that a delay of a week is not unheard of. With the introduction of scales, captains will have real time, relatively accurate and precise information about the agency's ultimate estimate of their Pacific cod harvests. While operations will still be dependent on observer sampling for estimates of halibut PSC and of the species composition of catch, these are not as crucial for the operation of the cooperative's catch sharing arrangements, because halibut PSC limits are rarely reached in this fishery. (Kinsolving, pers. comm., July 7, 2011; Down, pers. comm., July 7, 2011)

1.3.6 Summary of the RIR

Alternative 2

The costs of the scales alternative, Alternative 2, were described in Section 1.3.1. Firms will incur costs for the installation of a motion compensated flow scale, an observer sampling station with motion compensated platform scale, and video monitoring equipment. In addition, firms will incur annual inspection, repair, and maintenance costs. The requirement that one of the observers be lead level 2 qualified will also add to the operations costs, but the cost impact can't be quantified given uncertainty over the structure of observer markets, and over the impact of changes to be introduced into the fisheries under observer restructuring. NMFS will incur annual costs for the inspection and certification of scales, video monitoring equipment, and the observer sampling station.

The range of potential initial installation costs are estimated to be between $115,300 and $458,800 for a vessel. Subsequent annual expenses ranged between $7,600 and $8,100 per vessel. With 33 vessels estimated to incur these expenses, total costs ranged between $3.8 million and $15.1 million for installation, and between $250,800 and $267,300 a year, thereafter. These costs do not reflect potential negative (or positive) impacts on vessel operating efficiency, which could not be estimated quantitatively. NMFS was estimated to incur between $117,000 and $187,000 in costs the first year of the program, and about $26,000 per year in subsequent years.

Alternative 3

The costs of the second observer alternative, Alternative 3, were described in Section 1.3.2. These included the costs of the installation and annual inspection of an observer sampling station and associated motion compensated platform scale, the costs of a second observer, the costs of upgrading at least one of the observers to a lead level 2 observer level, and the costs of an electronic logbook.

The costs of constructing the observer sampling station were estimated to range between $0 (since some vessels already have observer sampling stations to comply with the rules governing CDQ groundfish fishing), and $30,100 (for a vessel that installs a station, purchases two platform scales - to have one for backup, and incurs initial certification and electronic logbook training costs). Inspection costs and annual maintenance and repairs for the observer station and platform scale were estimated to range for $0 to $500. The significant annual cost component for Alternative 3 is the cost of a second observer, which was estimated to range between about $35,000 and $78,000 per boat, depending on the number of days of groundfish fishing. As noted in the discussion of Alternative 2, the requirement that one of the observers be lead level 2 qualified will also add to the operations costs, but the cost impact can't be quantified.

Alternative 3 created significant costs for the NMFS. Much of this, including the cost of initial inspections of the observer sampling station, and the cost of developing the electronic logbook, were shared with Alternative 2. These one-time costs at the start of the program were expected to range between about $38,000 and $108,000. However, in addition, Alternative 3 requires significant expenditures in support of the additional observers. This was estimated to be about $662,000 a year.

Alternative 4

The preferred alternative allows the vessel operator to choose the scales or the observer option each year. The costs of the preferred alternative, Alternative 4, were described in Section 1.3.3. These would vary depending on whether the vessel operator chose the scales option or the additional observer option. Anecdotal information from industry representatives suggests that most operators will chose the scales option. The cost analysis in this RIR supports this conclusion. Thus, it is likely that the costs for the scales alternative provide a more accurate picture of program costs under the preferred alternative.

The benefits from this action were described in Section 1.3.4. It (a) allows NMFS to enforce Pacific cod catch limits in the presence of a voluntary cooperative; (b) gives freezer longline representatives greater confidence in the accuracy of NMFS Pacific cod catch estimates; and (c) improves the efficacy of the cooperative's catch share program, potentially contributing to the stability of this program. It was not possible to quantify these benefits.

The lead level 2 requirement

The lead level 2 requirement, coupled with the reduction in the number of sampled sets required to qualify for lead status, will increase the costs of fishing for operations within the cooperative. It is likely that freezer longliner operators will bid more to encourage observer companies to invest the logistical work and the relationships with individual observers that would be necessary to prepare observers for fixed gear lead status. Observer providers themselves are likely to bid up compensation for observers to encourage them to invest in obtaining fixed gear lead qualifications and to work on freezer longline vessels. To an unknown extent, costs to the fishing operations, and observer providers, may translate into income gains for observers; thus, these costs would not be costs from a national efficiency standpoint, but a transfer of resources from fishing operations to observers.

The lead level 2 requirement ensures that freezer longliners operating in the cooperative's quota share system carry more experienced observers. This has several benefits: (1) increases confidence in the accuracy and timeliness of observer data, (2) reduces data loss through inexperience, (3) reduces the possibility that data inaccuracies may be introduced as a result of pressure on the observer, or other manipulation of the data gathering process, from skippers and crew. The benefits from the requirement may be greater under Alternatives 2 and option 1 of Alternative 4 (scales approaches) under which only one observer will be on a vessel, than they would be under the two-observer approaches.

Additional considerations

Potential impacts of this action on rural fishery dependent communities are uncertain, but believed to be small. This is a catcher/processor fleet, largely based in more urbanized regions. The action would have its primary impact indirectly, through its effect on the cooperative, but the ultimate impact of the cooperative itself is not clear. While it may lead to some rationalization and reduction in fleet size, it may also extend the fishing season, and lead to more vessel activity in Alaska waters, and visits to Alaskan ports. This action may improve the cooperative's internal monitoring of member harvests, but it will also increase the costs of monitoring fish harvests.

This action is not expected to have a significant net impact on fishing vessel safety or on the potential for human injury or mortality. Alternative 3 would increase the number of observers placed on vessels, and thus at risk in case of an incident at sea. Increased observer coverage may be associated with a reduction in average crew size, as noted. This alternative may thus increase the number of people facing the risks of a fishing environment and reduce effective crew size, and possibly crew efficiency. This is not the case with Alternatives 1 or 2, and, as noted, probably significantly less likely under Alternative 4.

Enforcement costs are also likely to rise under all the alternatives, except the no action alternative, as enforcement personnel will be required to oversee new regulatory requirements for freezer longliners for longer periods than experienced in the past. Non-compliance with any of the regulations would result in additional enforcement actions that would increase enforcement costs. It is difficult to estimate the increased enforcement costs at this time, because the extent to which this fleet will comply with the regulations is not known.

2.0 Environmental Assessment

2.1 Introduction

The purpose of this section is to analyze the environmental impacts of a proposed federal action that would make changes to the monitoring and enforcement requirements for freezer longliners that participate in the BSAI Pacific cod and CDQ fisheries. An environmental assessment (EA) is intended to provide evidence of whether or not the environmental impacts of the action are expected to be significant (40 CFR 1508.9).

This action would affect vessels that are part of the longline catcher/processor subsector as defined in the Consolidated Appropriations act of 2005, section 219(A)(6), which states:

> LONGLINE CATCHER PROCESSOR SUBSECTOR.—The term‘‘longline catcher processor subsector’’ means the holders of an LLP license that is noninterim and transferable, or that is interim and subsequently becomes noninterim and transferable, and that is endorsed for Bering Sea or Aleutian Islands catcher processor fishing activity, C/P, Pcod, and hook and line gear.

LLP licenses are issued to an individual and are not vessel specific, they can be transferred from vessel to vessel and can be “stacked” so that a single vessel may have more than one LLP license. Thus there is not a fixed group of vessels that this action will impact. Because NMFS anticipates that there will be very little transferring of LLP licenses between vessels, the vessels that currently possess an LLP license meeting the definition above are considered the impacted entities. As shown in Table 1 there are currently 37 LLP licenses associated with 32 vessels in the universe of impacted entities. For analytical purposes, all catcher/processors that participated in a directed fishery for Pacific cod in the BSAI were considered. Some of these vessels currently hold an LLP license while others sold their LLP license, did not qualify for an LLP license, or have sunk.

There are longline catcher/processors fishing for; other species in the BSAI, or fishing exclusively in the GOA that do not meet this definition and are not considered.

A longline catcher/processor possessing one or more LLP licenses that authorize the vessel to directed fish for Pacific cod in the BSAI and to freeze that fish on board, will be referred to as a “freezer longliner” throughout this EA.

2.2 Alternatives

In order to address the problem identified in the purpose and need statement, identified in Section 1.1.2 of this document, NMFS has developed the following alternatives for analysis. The alternatives are discussed in detail in Section 1.1.4 of this document.

Alternative 1. No action. Catch of Pacific cod and incidentally harvested species by freezer longliners would continue to be accounted for by extrapolation of observer data. No additional monitoring measures would be implemented.[69]

Alternative 2. The scales alternative. Under this alternative, a freezer longliner fishing off Alaska with an LLP license for BSAI Pacific cod, at any time when directed fishing for Pacific cod is open or when participating in any groundfish CDQ fishery, would be required to:

- Weigh all Pacific cod that enters the vessel on a NMFS-approved motion-compensated scale;
- Provide a video monitoring system that clearly records all areas where catch sorting or weighing takes place, stores the data to a removable hard drive, and save those data for 120 days;
- Provide an observer sampling station meeting the requirements of 50 CFR 679.28(d);
- Carry a lead level 2 observer;
- Comply with the electronic logbook requirements specified at 50 CFR679.5(f).

Owners of freezer longliners that do not intend to participate in directed Pacific cod fishing in the BSAI, or any groundfish CDQ fishery, could choose to opt out. An opt out election would have to be made by November 1 of the prior year. A vessel that has opted out would not be allowed to directed fish for Pacific cod or participate in any groundfish CDQ fishery. Vessels that opted out would be allowed to participate in directed Pacific cod fisheries in the GOA.

Alternative 3. The increased observer coverage alternative. Under this alternative, a freezer longliner fishing off Alaska, at any time when directed fishing for Pacific cod is open or when participating in any groundfish CDQ fishery, would be required to:

- Carry two observers, at least one of whom has lead level 2 certification;
- Provide an observer sampling station meeting the requirements of 50 CFR 679.28(d);
- Comply with the electronic logbook requirements specified at 50 CFR679.5(f).

Owners of freezer longliners that do not intend to participate in directed Pacific cod fishing in the BSAI or any groundfish CDQ fishery could choose to opt out. An opt out election would have to be made by November 1 of the prior year. A vessel that has opted out would not be allowed to directed fish for Pacific cod or participate in any groundfish CDQ fishery. Vessels that opted out would be allowed to participate in directed Pacific cod fisheries in the GOA.

Alternative 4. The scales or enhanced observer coverage alternative (the preferred alternative). Vessel owners would be allowed to select between the measures described under Alternative 2 or Alternative 3 annually. The selection of an alternative would have to be made prior to November 1 of the year proceeding the year during which the alternative would be complied with. Once a vessel owner made an election, the vessel would be required to operate under that alternative for the entire fishing year. If a vessel owner does not make an election by November 1 of the prior year, the vessel would be subject to the increased observer coverage option.

[69] This statement of the alternative assumes that observer restructuring will be in place in January 2013.

2.3 Affected environment

The National Environmental Policy Act (NEPA) requires an assessment of both the biological, social, and economic consequences of fisheries management alternatives. It provides the members of the public an opportunity to be involved in and influence decision-making on federal actions.

An EA is prepared pursuant to NEPA to determine whether an action will result in significant effects on the human environment. An effect on a part of the environment may be either direct or indirect and beneficial or adverse. If the environmental effects of the action are determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact are the final environmental documents required by NEPA. If an analysis concludes that the action is a major federal action significantly affecting the human environment, an environmental impact statement (EIS) must be prepared.

The marine environment of the BSAI is made up of physical, biological, and human components that may be affected by the groundfish fisheries off Alaska. The physical components include geological, oceanographic, and climatic conditions. The proposed alternatives address revisions to observer coverage requirements, catch accounting, and licensing requirements. The alternatives are more likely to potentially affect the biological and human components of the marine environment because the alternatives propose changes to fisheries management measures. These measures are most likely to affect the biological component (by modifying how the catch of fisheries resource components are estimated) and socioeconomic component (by modifying factors associated with participation in the fisheries affected by this action).

The documents listed below contain extensive information about the fishery management areas, fisheries, marine resources, ecosystem, social, and economic elements of the BSAI groundfish fisheries. Rather than duplicate an affected environment description here, readers are referred to these documents, which are incorporated by reference into this document. This list is a partial listing of NEPA documents that have been prepared for BSAI fishery management measures. Internet links to these documents, as well as a comprehensive list of NEPA documents that have been prepared by NMFS, AKR and the Council are at *http://www.alaskafisheries.noaa.gov/index/analyses/analyses.asp* . Any additional information beyond what is included in the following references is contained in the section addressing each particular resource component in Section 2.0.

Alaska Groundfish Harvest Specifications Final Environmental Impact Statement (NMFS 2007). This EIS provides decision makers and the public with an evaluation of the environmental, social, and economic effects of alternative harvest strategies for the federally managed groundfish fisheries in the GOA and the BSAI management areas. The EIS examines alternative harvest strategies that comply with federal regulations, the BSAI FMP, and the Magnuson-Stevens Act. These strategies are applied to the best available scientific information to derive the total allowable catch estimates for the groundfish fisheries. The EIS evaluates the effects of different alternatives on the resource components of the BSAI, which include target species, non-specified species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, as well as, economic aspects of the BSAI fisheries.

Stock Assessment and Fishery Evaluation (SAFE) Report for the Groundfish Resources of the Bering Sea/Aleutian Islands Region (Council 2010). Annual SAFE reports contain a review of the latest scientific analyses and estimates of each BSAI species' biomass and other biological parameters. This includes the acceptable biological catch specifications used by NMFS in the annual harvest specifications.

The SAFE report also includes summaries of the available information on the BSAI ecosystem and the economic condition of the groundfish fisheries off Alaska.

Alaska Groundfish Fisheries Final Programmatic Supplemental Environmental Impact Statement (NMFS 2004). A final programmatic SEIS (Final PSEIS) was prepared to evaluate the fishery management policies embedded in the BSAI and GOA groundfish FMPs against policy level alternatives. NMFS issued a Record of Decision for the Final PSEIS on August 26, 2004, effectively implementing a new management policy that is ecosystem-based and more precautionary when faced with scientific uncertainty. The PSEIS serves as the primary environmental document for subsequent analyses of environmental impacts on the groundfish fisheries. For more information, see the Final PSEIS and related documents at *http://www.alaskafisheries.noaa.gov/sustainablefisheries/seis/default.htm*.

The Final PSEIS provides a recent complete description of the environment that may be affected by groundfish fishing activities in the following PSEIS sections:

Features of the physical environment, Section 3.3.
Threatened and endangered species, Section 3.4.
Groundfish Resources, Section 3.5.
Habitat, Section 3.6.
Seabirds, Section 3.7.
Marine mammals, Section 3.8.
Socioeconomic conditions, Section 3.9 (See also Section 3.2 of this document).
Ecosystem, Section 3.10.

Chapter 3 of the Final PSEIS establishes an environmental baseline, which is a description of the existing conditions that serve as the starting point for the document's analyses. This chapter provides a detailed description of the affected environment, including extensive information on fishery management areas, marine resources, and marine habitat in the North Pacific Ocean. The description of baseline environmental conditions was developed using the best available scientific information, which at the time that the PSEIS was drafted incorporated data up to 2002. This EA uses the PSEIS baseline as a starting point for the present evaluation of environmental effects and, therefore, incorporates the PSEIS baseline by reference.

Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska (NMFS 2005). This document evaluates alternatives for three separate actions. These actions include describing essential fish habitat (EFH), identifying a means to identify Habitat Areas of Particular Concern (HAPC), and minimizing the adverse effects of Council-managed fishing on EFH. The EFH EIS provides a thorough description of EFH in the BSAI, as well as a discussion of the past and present effects of different gear types on EFH.

2.4 Environmental effects of the alternatives

This section assesses the impact of this action's alternatives on the environment. NMFS anticipates that the actions contemplated in this analysis would become effective in January of 2013. As described more fully in Section 1.1.4 of the RIR, the "no action" alternative includes the observer restructuring program, which NMFS expects to be in place in January 2013. This

analysis assumes a restructured observer program that would require at least one observer on all fishing days for freezer longliners.[70] This implies:

- an increase in observer coverage for freezer longline vessels <125 feet LOA that currently are required to only carry an observer 30 percent of fishing days;
- no change in observer coverage requirements for freezer longline vessels ≥125 feet LOA

2.4.1 Effects on target species

Target species include the species covered in the BSAI and GOA groundfish FMPs. The most important target in this fishery is Pacific cod, however arrowtooth flounder, pollock, and skates are important groundfish species taken incidentally to Pacific cod fishing. The current Stock Assessment and Fishery Evaluation (SAFE) reports contain the most recent status of these target species.

Groundfish stocks in the BSAI and GOA are in good condition. The 2010 assessments prepared for the Council by the Alaska Fisheries Science Center report that, for the species for which a determination can be made (and this includes Pacific cod in the BSAI and GOA), there are no stocks which are overfished, or for which overfishing is taking place. (Council 2010c: 11; Council 2010d: 51)

Alternative 1: Alternative 1, the "no action" alternative, while not reducing coverage levels for BSAI freezer longliners targeting Pacific cod, will provide a level of monitoring that is lower than in other quota based fisheries. Since quota based programs create an incentive to misreport catch, there is a possibility that estimates of Pacific cod harvests by this fleet sector may be lower than actual harvests. This could lead to overoptimistic estimates of sustainable catch, and to OFLs, ABCs, and TACs that are higher than they should be to meet conservation objectives. Over time, this could lead to harvestable biomass levels that are lower than optimal. The extent of underreporting cannot be projected quantitatively, thus, it is not possible to make quantitative estimates of the potential impact on Pacific cod stocks.

Experience with other quota programs has demonstrated that estimates of catch and bycatch are routinely challenged by industry. When sets are unsampled, NMFS must use the species composition and weight data collected from other, sampled, sets to generate an estimate of catch in the unsampled set. Without motion compensated platform scales, observers must use far less accurate spring scales and the lack of an observer sampling station can reduce the size of sample that an observer can reasonably be expected to enumerate. All of these factors could result in less precise data that is more open to challenge by stakeholders.

The limitation on data precision, and the need for vessel and haul specific catch data, are addressed by the requirements of the alternatives for either weighing all Pacific cod on motion compensated scales, or for a second observer to increase the proportion of sampled sets. These or similar measures are necessary to operate a quota based program that minimizes the potential for data misreporting and provides an unambiguous record of catch that NMFS and quota holders can agree on.

This fleet sector also takes other groundfish target species, principally arrowtooth flounder, pollock, and skates, as incidental catches while it is targeting Pacific cod. The cooperative and its quota share program does not create new incentives to misreport these species.

[70] Since May 2011, vessels fishing CDQ Pacific cod have been subject to the same observer requirements as vessels fishing for non-CDQ Pacific cod. (NMFS 2011d). With the advent of the observer restructuring program, this will be one observer 100 percent of the time.

While Alternative 1 may have an adverse impact on BSAI Pacific cod stocks, this is unlikely to be a significant impact. The Pacific cod freezer longline sector only accounts for about half of BSAI Pacific cod harvests.[71] Existing observer programs and enforcement efforts will constrain misreporting, and if the existing program were to generate sufficient uncertainty about harvest levels, the Council could adopt a more conservative approach, creating larger buffers between BSAI Pacific cod OFLs, ABCs, and TACs. The absence of significant environmental impacts, does not preclude possible social and economic impacts as aggregate harvests are reduced for freezer longliners and other sectors.

Alternatives 2, 3, and 4: Alternatives 2, 3, and 4 each provide levels of harvest monitoring that are comparable to those implemented in other quota based programs, and are believed by NMFS to provide harvest estimates of comparable quality. Thus, for biological impact purposes, these three alternatives are evaluated together. Alternative 3, which increases observer coverage, may lead to improved estimates of incidental catches of other groundfish target species, such as arrowtooth, pollock, and skates, which are taken incidentally to fishing for Pacific cod. Under Alternative 4 some vessels may choose a second observer option, and this could also improve estimates of catches of these species on these vessels. These approaches are expected to produce accurate information about Pacific cod harvests, may lead to improvement in estimates of catches of other groundfish target species, and therefore may improve groundfish fishery management. NMFS does not expect them to have significant environmental impacts.

2.4.2 Effects on prohibited species

The only PSC species taken in quantity in the freezer longline fishery for Pacific cod is halibut. In addition to receiving a sector specific allocation of Pacific cod, the freezer longline sector receives specific allocations of halibut PSC. In past years, vessels were given two seasonal allotments of halibut. The first was made available from January 1 until June 10, and the second was made available on August 15. This effectively prevented fishing for Pacific cod between June 10 and August 15. In 2011, the specifications for halibut PSC in this fleet were modified, to release halibut PSC on June 10, as well as August 15. If all of the available halibut PSC were taken during one of the seasonal periods, the Pacific cod fishery would shut down until another seasonal allocation was made available.

The IPHC analyzes the status of the halibut stocks and sets the constant exploitation yield (CEY). The CEY is adjusted for removals that occur outside the commercial directed hook-and-line harvest (incidental catch in the groundfish fisheries, wastage in halibut fisheries, recreational harvest, subsistence use) to determine the commercial directed hook-and-line quota. The 2011 assessment revised the 2010 estimate of 295 million pounds downwards to 267 million pounds (http://www.iphc.washington.edu/publications/bluebooks/IPHC_Bluebook_2012.pdf). The coastwide survey index of abundance declined by approximately 20 percent from 2010 to 2011. The 2011 stock assessment resulted in a preliminary coastwide estimate for the 2012 Fishery CEY of 33.88 million pounds, a decline of approximately 19 percent from the 2011 value of 42.02 million pounds.

In some fisheries, a lack of sufficient halibut PSC will cause a directed fishing closure before TAC can be reached. In these fisheries, NMFS has experienced problems with vessel crew attempting to manipulate halibut PSC estimation by the observer in order to extend the season. However, halibut PSC has not resulted in the premature closure of a non-trawl BSAI Pacific cod fishery since 2001. Further, a cooperative fleet is more able to minimize halibut PSC by sharing information and requiring members to avoid practices or areas that could increase PSC. Thus it is unlikely that the fishery will be constrained by halibut PSC.

[71] Between 47 percent and 58 percent of the TAC, depending on year, between 2004 and 2010 (NMFS AKR Catch accounting system).

Alternatives 1, 2, 3, and 4: Because the fishery is unlikely to be constrained by halibut PSC, there would be very little incentive for vessel crew to attempt to manipulate halibut PSC rates, and it is unlikely that any of the alternatives would have any impact on prohibited species, because halibut take is constrained by the PSC allocation. Alternative 3, the second observer alternative, will generate more data on halibut PSC catch, and will improve our estimates. Some vessels may choose observers under Alternative 4, and this could lead to some improvements in PSC catch estimates as well. None of the alternatives will an effect on halibut PSC, given the nature of this action.

2.4.3 Effects on forage fish

Alternatives 1, 2, 3, and 4: Forage fish include those species which are a critical food source for many marine mammal, fish, and seabird species. The current SAFE report contain the most recent status of forage fish. NMFS does not expect that the catch of forage fish species will increase as a result of any alternative. Under Alternative 3, and to some extent, perhaps, under Alternative 4, increased observer coverage will improve estimates of catch composition, and of the volume of forage fish harvested in this fleet. Nevertheless, none of the alternatives would have an effect on forage fish, as this action would only affect the monitoring and catch accounting of this species.

2.4.4 Effects on benthic habitat and essential fish habitat

Alternatives 1, 2, 3, and 4: The alternatives considered under this action are not expected to change the locations, or operational practices of the freezer longline fisheries. Therefore, none of the alternatives considered in this action are expected to adversely affect marine benthic habitat or EFH in any manner or to an extent not already addressed in previous NEPA analyses, including the EFH Final EIS (NMFS 2005a).

2.4.5 Ecosystem considerations

Alternatives 1, 2, 3, and 4: The alternatives in this analysis address regulatory amendments that would modify observer coverage, and are non-biological, administrative changes to the Pacific cod freezer longline fisheries. Because these changes are primarily administrative in nature, and are unlikely to produce population-level impacts for marine species, or changes to community-level or ecosystem-level attributes beyond the range of natural variability for the system, these alternatives are expected to have no effect at an ecosystem level.

2.4.6 Marine Mammals

This action does not change the timing, location, or quantity of fishing in a manner that would affect marine mammals. Freezer longline vessels interact with the endangered western population of Steller sea lion, and Pacific cod are one of three prey species targeted by fisheries that are under special restrictions for their protection. NMFS uses Steller sea lion protection measures to ensure the groundfish fisheries off Alaska are not likely to jeopardize the continued existence of the western population of Steller sea lions or adversely modify their critical habitat. The management measures disperse fishing over time and area to protect against potential competition for important Steller sea lion prey species near rookeries and important haulouts. The effects of the Pacific cod fishery on Steller sea lions were analysed in the EA/RIR for Revisions to the Steller Sea Lion Protection Measures for the Bering Sea and Aleutian Islands Management Area Groundfish Fisheries" (http://alaskafisheries.noaa.gov/analyses/ssl/sslprotections_earir1210.pdf). The most recent information on the status of marine mammals can be found in the 2010 marine mammal stock assessment report. The 2010 marine mammal stock assessment report provides background information, population estimates, population trends, and estimates of the potential biological removal levels for each marine mammal stock

The 2010 Marine Mammal Stock Assessment Report (Allen and Angliss 2011) is available at http://www.nmfs.noaa.gov/pr/pdfs/sars/ak2010.pdf.

Alternative 1: To the extent that a lower level of monitoring results in the under reporting of Pacific cod catch, the no action alternative could potentially reduce the effectiveness of the stock assessments for setting harvest levels of marine mammal prey species. To date, there is no indication that groundfish stocks are overfished, or that, with the Steller sea lion protection measures harvests have resulted in prey competition that may lead to population level effects for any marine mammals. Therefore, Alternative 1 would have no effects on marine mammals.

Alternatives 2, 3, and 4: These alternatives would impose monitoring measures on the freezer longline fishery in line with the measures employed for other quota based fisheries and have the potential to minimize or prevent the under reporting of Pacific cod harvest. To the extent that this may help prevent an increase in the exploitation rate of the Pacific cod stock, this action may have some beneficial impact on Pacific cod stocks. Better management of groundfish stocks may result in improved availability to marine mammals.

Given the measures currently in place to protect marine mammals, and the conservative nature of the TAC setting process, the impact of the action alternatives on marine mammals would be limited. There is no indication that the harvest of groundfish prey by the fisheries is currently having a population level effect on marine mammals, so any improvement in stock assessments is not expected to result in population level effects. As a result, no no effects to marine mammals are anticipated as a result of this action.

2.4.7 Effects on Seabirds

Alternatives 1, 2, 3, and 4: The EA/RIR/IRFA for seabird avoidance measures in the hook-and-line fisheries off Alaska to reduce the incidental take of the short-tailed albatross and other seabird species (http://alaskafisheries.noaa.gov/analyses/seabirds/EARIRFRFA1007.pdf) details the effects of the Pacific cod fishery on seabirds. The endangered short-tailed albatross (*Phoebastria albatrus*) occurs in areas of the BSAI where Pacific cod fishing occurs, and the incidental take of these and other seabird species occurs. Techniques have been developed to minimize take of seabirds, and longline vessels are required to employ sea bird avoidance measures as specified in 50 CFR 679.24(e)(2). Because of these measures and the *de minimis* nature of the change in fishing behavior as a result of any of the alternatives, it is unlikely that selection and implementation of any these alternatives would have a discernible effect on seabird populations, thus, NMFS expects that this action's would have no effects on seabirds.

2.5 Socioeconomic Effects

The expected economic and social effects are discussed in the RIR and summarized in Section 1.3.5 of the RIR. The reader is directed there for details. An evaluation of the significance of social and economic impacts is not required for a finding of no significant impact, and none was prepared here.

2.6 Cumulative Effects

NEPA requires that EAs analyze the potential cumulative effects of a proposed action and its alternatives. An EA must consider cumulative effects when determining whether an action significantly affects environmental quality. Cumulative effects are those combined effects on the quality of the human environment that result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions. (40 CFR 1508.7, 1508.25(a), and 1508.25(c))

Cumulative impacts can result from individually minor, but collectively significant, action taking place over time. The concept behind cumulative effects analysis is to capture the total effects of many actions over time that would be missed by evaluating each action individually.

The potential effects of the BSAI groundfish fisheries on BSAI resource components are detailed in the Final PSEIS (NMFS 2004, Chapter 4) and in the Groundfish Harvest specification EIS (NMFS 2007). Past actions that impact the Pacific cod fishery are detailed in section 1.1.5 and 1.2.2. The Pacific cod freezer longline fisheries are a subset of these fisheries. Direct effects of fish harvesting include fishing mortality, changes in biomass, and changes in population structure due to the spatial and temporal concentration of catch. Indirect effects include the changes in prey availability and changes in habitat suitability. Indirect effects are not anticipated to occur with any of the alternatives analyzed because the proposed action would not change overall fishing practices that indirectly affect prey availability and habitat suitability.

No cumulative significant impacts on these resources are anticipated with the proposed action because no direct or indirect effects on BSAI resources have been identified.

2.7 Conclusions

The actions contemplated as part of this analysis are highly unlikely to impact the natural environment. While we believe that enhanced monitoring is a necessary part of a quota program, it is unlikely that a failure to implement the monitoring measures detailed in Alternatives 2, 3 or 4 would result in significant impacts.

Socioeconomic impacts are fully discussed in Chapter 1 (RIR) of this document. In brief, implementing any of the alternatives other than no action alternative will result in increased costs for the owners of freezer longline vessels. Whether Alternative 2 or 3 would result in the highest cost would be a function of vessel size and layout. However, the industry as represented by the FLCC, has indicated a strong preference for the use of scales over increased observer coverage. Alternative 4 will allow vessel owners the flexibility to choose the monitoring approach that they feel is most economically feasible and thus would be expected to have the lowest socioeconomic impact of the three action alternatives. Given that, the increased costs associated with the action alternatives are offset by benefits to the cooperative, we believe that the socioeconomic impacts will not be significant.

In order for NOAA to make a finding of no significant impact (FONSI), the FONSI must identify and address each of the significance criteria contained in the CEQ regulations and NAO 216-6, sections 6.01 and 6.02. The significance criteria questions and responses to those questions that result from this analysis, are set forth below.

1) Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?

Response: The action would add additional monitoring requirements for freezer longline vessels that fish for Pacific cod in the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA). It will not change the type of gear used, the manner in which it is deployed, the location where fishing takes place, or the duration of fishing activities. This action is not expected to jeopardize the sustainability of any target species because this action will not affect any aspect of how the Pacific cod fishery in the BSAI or GOA is prosecuted. (RIR/EA Section 2.4.1).

2) Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species?

Response: The action would add additional monitoring requirements for freezer longline vessels that fish for Pacific cod in the BSAI and GOA. It will not change the type of gear used, the manner in which it is deployed, the location where fishing takes place, or the duration of fishing activities. This action is not expected to jeopardize the sustainability of any non-target species because this action will not affect any aspect of how the Pacific cod fishery in the BSAI or GOA is prosecuted. (RIR/EA Sections 2.4.2 and 2.4.3).

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

Response: The action would add additional monitoring requirements for freezer longline vessels that fish for Pacific cod in the BSAI and GOA. It will not change the type of gear used, the manner in which it is deployed, the location where fishing takes place, or the duration of fishing activities. This action is not expected to cause damage to the ocean and coastal habitats and/or essential fish habitat because this action will not affect any aspect of how the Pacific cod fishery in the BSAI or GOA is prosecuted. (RIR/EA Section 2.4.4).

4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

Response: The proposed action would impose new monitoring requirements on freezer longline vessels that target Pacific cod in the BSAI. These new monitoring requirements would require that vessel owners either carry an additional observer or weigh all Pacific cod catch. This action is not expected to have a significant net impact on fishing vessel safety or on the potential for human injury or mortality. Alternative 3 would increase the number of observers placed on vessels, which may result in a reduction in average crew size. Thus, this alternative may increase the number of people facing the risks of a fishing environment and reduce effective crew size, and possibly crew efficiency. This is not the case with Alternatives 1 or 2. It may be the case with Alternative 4, the preferred alternative, to the extent that vessel operators choose the observer option.

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

Response: As described in sections 2.4.6 and 2.4.7 of the Environmental Assessment, the Pacific cod fishery in the BSAI has the potential to interact with the endangered short-tailed albatross and the western distinct population segment of Steller sea lions. The changes contemplated as part of this action will not alter the nature of these interactions, and impacts on both species have been fully analyzed in the EA/RIR/IRFA for seabird avoidance measures in the hook-and-line fisheries off Alaska EA/RIR/IRFA for seabird avoidance measures in the hook-and-line fisheries off Alaska to reduce the incidental take of the short-tailed albatross and other seabird species (http://alaskafisheries.noaa.gov/analyses/seabirds/EARIRFRFA1007.pdf) and the EA/RIR for "Revisions to the Steller Sea Lion Protection Measures for the BSAI Groundfish Fisheries" (http://alaskafisheries.noaa.gov/analyses/ssl/sslprotections_earir1210.pdf).

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

Response: The proposed action is not expected to have any impact on biodiversity and or ecosystem function within the BSAI or GOA. The additional monitoring requirements proposed as part

of the preferred alternative would not be expected to significantly change any aspect of how the fishery is prosecuted. (RIR/EA Section 2.4.5).

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

Response: The monitoring measures contemplated by this action would impose additional costs on the owners of participating vessels. These costs have been fully analyzed in Section 1.3 of the Regulatory Impact Review (RIR) prepared for this action. Based on conversations with industry members, it is likely that most participating vessels would choose the scales option. Startup costs for this option are estimated to range from about $115,000 to about $459,000 per vessel with ongoing costs ranging from $7,600 to $8,100 per vessel per year. These costs are highly variable because of the diversity of vessel size and layout in this fleet. These costs are balanced by benefits to the vessel owners of improved catch accounting and more reliable estimates of catch for quota management.

8) Are the effects on the quality of the human environment likely to be highly controversial?

Response: This action would impact the holders of the 37 License Limitation Program (LLP) licenses allowing participation in the BSAI freezer longline Pacific cod fishery. All of these owners are members of a single fishing cooperative that has gone on record supporting the preferred alternative. NMFS has held two public meetings for LLP holders, and representatives from the majority of companies holding LLP licenses have attended. NMFS staff has also spoken individually with the majority of LLP holders. Given the broad acceptance of this action by the impacted entities, this action is not expected to be controversial. (RIR/EA Section 1.3).

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

Response: Because this action will not change the location or intensity of fishing activities, it is expected to have no impact on any unique area including essential fish habitats or ecologically critical areas.

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: The costs associated with this action are well known and have been estimated for similar fleets (catcher/processors targeting pollock, head-and-gut catcher/processors fishing in the BSAI, catcher/processors targeting rockfish in the GOA). The vessels and companies impacted by this action are a closed class, and NMFS staff has extensively discussed the potential costs with vessel owners, equipment manufacturers and installers, and observer providers. There is very little uncertainty associated with this action's impact on the human environment, and it is highly unlikely to involve unknown risks. (RIR/EA Section 1.3).

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

Response: A series of other actions have created the opportunity for industry members to form a voluntary cooperative. The history of these actions is described in Section 1.2.2 of the RIR. The current action responds to the formation of this voluntary cooperative by proposing monitoring standards similar to those that have been promulgated for other quota programs. No cumulative significant impacts on

these resources are anticipated with the proposed action because no direct or indirect effects on BSAI resources have been identified. (RIR/EA Section 2.6).

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

Response: Pacific cod fishing in the BSAI and GOA does not take place in any location listed in or eligible for listing in the National Register of Historic Places. There is no possibility that this action directly or indirectly would cause the loss or destruction of scientific, cultural, or historical resources.

13) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

Response: Because this action will not change the type of gear used, the manner in which it is deployed, the location where fishing takes place, or the duration of fishing activities, there is no possibility that it would result in the introduction or spread of a nonindigenous species.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

Response: If NMFS promulgates regulations that establish a formal regulatory fishing cooperative to replace the current voluntary fishing cooperative, the regulations developed as a result of this action would be expected to be part of the regulatory package governing the cooperative. The package of monitoring measures that have been developed for this action are similar to those imposed on other recently developed catch share programs and follow an existing and well established precedent for the monitoring of individual catch shares. (RIR/ EA Section 1.2.2).

15) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Response: This action proposes no measure that would reasonably be expected to threaten a violation of Federal, State, or local law or any requirement imposed for the protection of the environment.

16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Response: The overall harvest of Pacific cod in the BSAI is determined by the annual process to set total allowable catch (TAC). Apportionments of Pacific cod to the various gear and processing sectors is set forth in regulation. This action will not alter the TAC of Pacific cod and is not expected to alter the dynamics of the fishery in any way that would change the catch of target or non-target species. No cumulative significant impacts on these resources are anticipated with the proposed action because no direct or indirect effects on BSAI resources have been identified. (RIR/EA Section 2.4.2).

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