2016 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska

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Fisheries Monitoring and Analysis Division, Alaska Fisheries Science Center
National Marine Fisheries Service
7600 Sand Point Way NE
Seattle, WA 98115

National Marine Fisheries Service, Alaska Regional Office
P.O. Box 21668
709 W. 9th Street
Juneau, Alaska 99802

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Contents

Executive Summary

This Final 2016 Annual Deployment Plan (ADP) documents how the National Marine Fisheries Service (NMFS) intends to assign fishery observers to vessels fishing in the North Pacific during the calendar year 2016.

- NMFS will use the trip-selection method (i.e., the trip-selection pool) to assign observers to vessels in 2016.

- In June, NMFS recommended and the Council supported changing the definitions of the deployment strata and considering designs based on gear and Fishery Management Plan (FMP) area. Faunce (2015a) conducted an evaluation of alternative sampling designs that was presented to the Council at its October 2015 meeting in Appendix B of the draft 2016 ADP (NMFS 2015a). The sampling design for observer deployment involves two elements: 1) defining subdivisions of the population of partial coverage trips (stratification); and 2) allocating total observer deployments within these subdivisions (sample allocation). Six stratification schemes, including several based on gear and FMP areas, and two allocation methods (proportional allocation and optimal allocation) were evaluated. The evaluation generated 12 alternative sampling designs (6 stratification schemes and 2 allocation strategies).

  The alternative designs were compared by simulating observer deployments and estimating the relative precision of total retained and discarded groundfish. We note that the measures of precision presented by Faunce (2015a) are not equivalent to the estimates of variance that arise from the estimation processes that incorporate the hierarchical sampling design of the observer program and the Catch Accounting System. The 12 alternative designs were evaluated using gap analysis (i.e., exploring situations where no observer data would be available). The gap analysis determined which sampling designs had a 50% probability of having at least 3 observed trips. The designs that met this criterion were ranked based on results from the simulations to provide a relative comparison among all the sampling designs. The analysis found that a stratification scheme based on gear with an optimal allocation strategy had the highest overall ranking. This sampling design was a large improvement over the small and large-vessel trip sampling designs used in previous ADPs. Additionally, the gear-only stratification outperformed stratification schemes that were defined by both gear and FMP area (e.g., trawl in the GOA; trawl in the BSAI).

- Based on the analysis of alternative deployment strategies (Faunce 2015a), the draft ADP recommended (NMFS 2015a), and the Council supported (Appendix A), a stratification scheme based on gear with an optimal allocation. There will be three trip-selection strata for 2016:
  - ***Trawl trip-selection pool*:** This pool is comprised of all catcher vessels in the partial coverage category fishing trawl gear.
  - ***Hook-and-line trip-selection pool***: This pool is comprised of vessels in the partial coverage category that are greater than or equal to 40 ft length overall (LOA) and are fishing hook-and-line gear.

- ***Pot trip-selection pool***: This pool is comprised of vessels in the partial coverage category that are greater than or equal to 40 ft, LOA and are fishing pot gear.

- NMFS will use the optimal allocation in 2016 to determine the proportion of deployments that will be allocated to each trip-selection pool (strata). To determine the deployment rate for each stratum, NMFS estimated a budget for available sea-days and anticipated fishing effort (Appendix B). The deployment rates for the 3 trip-selection strata in 2016 are:
  - Trawl – 28%
  - Hook and Line – 15%
  - Pot – 15%

- The "No selection pool" is comprised of vessels that will have no probability of carrying an observer on any trips for the 2016 fishing season and contains two categories:
  - Catcher vessels less than 40 ft LOA, or vessels fishing with jig gear.
  - *Electronic Monitoring (EM) selection pool*: Fixed gear vessels that have opted-into the EM selection pool (see Appendix C). For 2016, 58 fixed-gear vessels 40-57.5 ft LOA will participate in the EM selection pool and will carry EM systems as described in the EM Pre-Implementation Plan[1]. An additional three vessels >57.5 ft have volunteered to carry stereo camera equipment and will also be placed in the no selection pool.

- There will be no changes to the Observer Declare and Deploy System (ODDS) in 2016. NMFS will maintain the ability for vessels to log three trips in advance in ODDS. In addition, for vessels 40-57.4 ft LOA, the programming in ODDS to automatically release a trip from observer coverage if the two previous trips were observed trips will remain in place for 2016 (i.e., if two trips in a row were observed and a third trip is selected, then the third trip will be released from coverage).

- NMFS will not grant conditional releases or temporary exemptions (e.g. for insufficient bunk space or life-raft capacity) for vessels subject to observer coverage in 2016. Instead, NMFS will mitigate the impact of human observation on vessels through the EM Pre-Implementation Plan by placing vessels into the EM selection pool with no requirement to carry an observer. Vessels that had received a conditional release or temporary exemption in previous years (2013, 2014, and 2015) had an opportunity to opt-in to the EM selection pool and were given priority to participate in the EM research.

- When vessels log trips in ODDS, they are given an ODDS trip receipt with a unique trip number. NMFS will implement modifications to the eLandings system that enables the ODDS trip number to be entered on a groundfish landing reports in eLandings starting in 2016. When landing reports are entered in eLandings at the end of the trip, the vessel operators will provide their ODDS trip number so that it can be entered on the landing report. Having ODDS trip numbers entered on groundfish landing reports will facilitate data analysis and provide better linkage between ODDS and eLandings.

[1] Available at: http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/EM2016Plan915.pdf

- NMFS will continue to collect genetic samples from salmon caught as bycatch in groundfish fisheries to support efforts to identify stock of origin. The same sampling protocol established in the 2014 ADP (also used in 2015) will again be used in 2016.

- Trawl vessels that fish for Pacific cod in the BSAI will be given the opportunity to opt-in to full observer coverage and carry an observer at all times when fishing in the BSAI using the same approach as 2015.

- NMFS will continue to communicate the details of the ADP to affected participants though letters, public meetings, and posting information on the internet. Outreach activities during 2015/2016 fall and winter will focus on changes to observer deployment in the 2016 ADP and the ongoing work to integrate EM into the observer program.

1 Introduction

1.1 Purpose and authority

This 2016 Annual Deployment Plan (ADP) documents how the National Marine Fisheries Service (NMFS or Agency) intends to assign at-sea and shoreside observers to vessels and processing plants engaged in fishing operations in the North Pacific under the authority of the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI FMP), the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA FMP), and the Northern Pacific Halibut Act of 1982. Data collection by observers is currently the only reliable and verifiable method available for NMFS to gain fishery discard and biological information on fish, and data concerning seabird and marine mammal interactions with fisheries. Onboard observers also perform the critically important task of collecting biological data such as species composition, weights, and tissue samples that are important for stock assessment scientists and researchers. Much of this information is expeditiously available (e.g., daily or at the end of a trip, depending on the type of vessel) to ensure effective management.

Details on the legal authority and purpose of the ADP are found in the Final Rule for Amendment 86 to the BSAI FMP and Amendment 76 to the GOA FMP (77 FR 70062, November 21, 2012). This ADP follows section 313 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA, 16 U.S.C 1862), which authorizes the North Pacific Fishery Management Council (Council) to prepare a fisheries research plan that requires the deployment of observers into the North Pacific fisheries and establishes a system of fees. The ADP describes the science-driven method for observer deployment that enables observers to perform their duties, including species identification, quantification and disposition of catch, documenting interactions with marine mammals and seabirds, and collection of biological specimens to support research and assessment of biological resources in the North Pacific. This ADP specifically describes observer deployment for the partial coverage category (50 CFR 679.51(a)) in the halibut and groundfish fisheries in 2016.

1.2 Process and Schedule

NMFS and the Council created the ADP process to provide flexibility in the deployment of observers to gather reliable data for estimation of catch in the groundfish and halibut fisheries off Alaska. NMFS and the Council recognized that the amount of observer coverage available for any given year would be dependent on available revenue generated from fees on groundfish and halibut landings. The ADP process allows NMFS to adjust deployment in each year so that sampling can be achieved within financial constraints. In September, 2015, NMFS released an Observer Program Supplemental Environmental Assessment (SEA) (NMFS 2015c) prepared in response to a Court Order to consider whether the restructured Observer Program would yield reliable, high quality data given likely variations in costs and revenues. The SEA reached the same conclusion as the EAR/RIR/IRFA analysis prepared in 2011 for the restructuring action (NPFMC and NMFS 2011).

The ADP process ensures that the best available information is used to evaluate deployment, including scientific review and Council input, to annually determine deployment methods. Some

aspects of observer deployment can be adjusted through the ADP, including the rates of coverage, the assignment of vessels to a specific partial coverage selection pool, or the allocation strategy used to deploy observers in the partial coverage category. On an annual basis, NMFS develops an ADP to describe how observers will be deployed for the upcoming calendar year and prepares an annual report that evaluates the performance of the prior year's ADP implementation. The schedule for the 2016 ADP is as follows:

- June 2015: NMFS presented the 2014 Annual Report to the Council and the public (NMFS 2015b). The 2014 Annual Report provided a comprehensive evaluation of observer program performance including, costs, sampling levels, issues and potential changes for the 2016 ADP. The 2014 Annual Report identified areas where improvements are needed to (1) collect the data necessary to manage the groundfish and halibut fisheries, (2) maintain the scientific goal of unbiased data collection, and (3) accomplish the most effective and efficient use of the funds collected through the observer fees. This review informed the Council and the public about how well various aspects of the program are working.

- June - September 2015: Using information and analyses from the 2014 Annual Report (NMFS 2015b) and Council recommendations (Appendix A), NMFS prepared and released the Draft 2016 ADP (NMFS 2015a) containing recommendations for deployment methods in the partial coverage category. The Council's Observer Advisory Committee (OAC) and Groundfish Plan Teams reviewed the 2015 ADP.

- October 2015: The Council and its SSC reviewed the draft 2016 ADP and associated Plan Team and Observer Advisory Committee (OAC) recommendations. The Council provided recommendations for the final 2016 ADP (Appendix A).

- October - December 2015: Upon final analysis of the Council recommendations from its October meeting (Appendix A), NMFS finalizes the 2016 ADP and releases it to the public prior to the December 2015 Council meeting.

The analysis and evaluation of the data collected by observers and the ADP development is an on-going process; in June 2016, NMFS will present the 2015 Annual Report that will form the basis for the 2017 ADP.

2 Annual Report Summary

As described in Section 1.2, NMFS releases an Annual Report in June of each year that provides an evaluation of observer deployment under the ADP and includes an overview of the fees and budget associated with deployment, enforcement of the observer program regulations, a summary of public outreach events, and a scientific evaluation of observer deployment conducted by the Observer Science Committee (OSC). NMFS has released two Annual Reports: the 2013 Annual Report (NMFS 2014a) that was presented to the Council in June 2014; and the 2014 Annual Report (NMFS 2015b) that was presented to the Council in June 2015. In October, 2015, NMFS presented the draft 2016 ADP to the Council. This final 2016 ADP builds upon

NMFS recommendations in the Annual Reports and recommendations from the Council based on their review of the Annual Reports and the draft 2015 ADP (Appendix A).

In both the 2013 and 2014 Annual Reports, NMFS evaluated the deployment method and concluded that trip selection was working well whereas the vessel selection process had several problems. Based on these evaluations, NMFS recommended that participants in the vessel selection category be placed in the trip selection category and this recommendation was implemented under the 2015 ADP. NMFS continues to recommend trip-selection method for all vessels in 2016.

The Annual Reports have evaluated observer deployment in each of the sampling strata for each year. The strata definitions from 2013-2014 have been based on gear and vessel size where all trawl vessels and fixed gear vessels >57.5 ft length overall (LOA) were placed in one strata, and all fixed gear vessels from 40-57.5ft LOA were placed in a separate strata. In the 2014 Annual Report, the Observer Science Committee recommended exploring new strata definitions based on gear and FMP area (NMFS 2015b). They also noted that it would be important that definitions of the sampling strata be based on characteristics that are known before the trip begins and that each trip can be assigned to a single sampling stratum at the time the trip is logged. Based on these recommendations, NMFS and the Council recommended changing the definitions of the deployment strata (Appendix A). Faunce (2015a) evaluated alternative sampling designs and based on this analysis NMFS will implement a sampling strata definition based on gear in 2016 (section 3.1).

Recognizing the challenging logistics of putting observers on small vessels and low levels of catch by these vessels, NMFS has placed vessels less than 40ft LOA and jig vessels in the no-selection pool for observer coverage since 2013. However, the Annual Reports and the SEA highlighted the data gaps caused by not having any observer information on vessels less than 40 ft LOA. NMFS proposes to continue placing vessels less than 40ft LOA in the no selection pool in 2016 (section 3.1) and recommends that vessels less than 40ft LOA be considered for testing of electronic monitoring in the future.

The Observer Declare and Deploy System (ODDS) facilitates random selection of trips for fishery operations that are in partial coverage and within one of the trip selection pools. Vessels are required to log trips 72 hours prior to departure to allow the observer provider, AIS, adequate time to mobilize observers to vessels. However, users are also given flexibility to accommodate their fishing operations; up to three trips may be logged in advance of fishing and trips can be cancelled to accommodate changing plans. If a trip that was selected for observer coverage is cancelled by the user in coordination with AIS, then the vessel's next logged trip is automatically selected for coverage. The process of “inheriting” observed trips that were cancelled has been in effect since the ODDS system became operational in 2013. The inherited selection of this next logged trip preserves the number of selected trips in the year, but cannot prevent the delay of selected trips during the year. The 2014 Annual Report provided an evaluation of ODDS performance and found that cancelled trips resulted in temporal bias. Based on these findings, the draft 2015 ADP (NMFS 2015a) proposed a modification to ODDS to only allow two trips to be logged in advance. NMFS received feedback on the proposed change to ODDS from industry members, OAC, and the Council (Appendix A). In particular, industry members emphasized

that the ability to log three trips is critical in a race-for-fish situation, where vessels are doing quick turn-arounds between trips. The OAC discussed whether it could be possible to apply the change only to specific gear types, but decided that there was no obvious solution, and asked NMFS to evaluate the scope of the problem by gear type and fishery before moving forward with changes. The Council concurred with the OAC and recommended that NMFS maintain the ability for vessels to log three trips in ODDS in 2016 (Appendix A). In response to the industry and Council input, NMFS will make no changes in ODDS in 2016 (see section 3.3). Moving forward, NMFS will continue to evaluate temporal bias and consider potential solutions.

In 2015, programming was in place in ODDS to automatically release a trip in the small-vessel trip selection pool from observer coverage if the two previous trips were observed trips. The draft 2015 ADP recommended removing this programming; however, NMFS will make no changes to ODDS in 2016 due to feedback from industry members, the OAC, and the Council. In 2016, fixed gear vessels 40-57.5 ft LOA that have three trips in a row selected for observer coverage will have the third trip automatically released from coverage.

NMFS will no longer issue conditional releases in 2016 (section 3.4), and will instead mitigate the impact of human observation on vessels through the EM Pre-Implementation Plan by placing vessels into the EM selection pool with no requirement to carry an observer. This change in the conditional release policy grew from concerns by NMFS about data quality and progress on the EM Pre-Implementation Plan. In both the 2013 and 2014 Annual Reports, NMFS raised a number of concerns about data quality that resulted from the policy of issuing conditional releases and temporary exemptions in the vessel selection stratum (i.e., the small vessel trip-selection stratum in the 2015 ADP). In light of these concerns, NMFS updated its conditional release policy in the 2015 ADP to only provide temporary exemptions to vessels with insufficient life raft capacity. With the new life raft release policy in place, NMFS issued six conditional releases through November, 2015.

For 2016, the EM workgroup developed an EM Pre-Implementation Plan for small hook-and-line vessels that was presented and approved by the Council at its October, 2015, meeting. As part the EM selection process, the EM workgroup recommended that NMFS send a letter to the small-vessel fixed-gear fleet requesting owners to indicate if they are interested in participating in the EM cooperative research being implemented through the EM Pre-Implementation (Appendix C). NMFS sent a letter to all 40-57.5 ft LOA fixed-gear vessels requesting that anyone interested in participating should respond and that priority would be given to vessels that had been granted temporary exemptions and conditional releases for insufficient life raft capacity or bunk space. The EM workgroup proposed and the Council approved a maximum of 60 vessels be allowed in the EM selection pool for deployment of standard camera systems and set a November 20, 2015, deadline for vessels to opt-into the EM selection pool. Fifty-eight 40-57.5 ft LOA fixed-gear vessels responded to the letter and will be included in the EM selection pool for standard camera systems. An additional three vessels >57.5 ft have volunteered to carry stereo camera equipment and will also be placed in the no selection pool.

Both the 2013 and 2014 Annual Reports noted that data analysis issues were created by the lack of a shared trip identifier between ODDS and eLandings. The eLandings system enables the Alaska fishing industry to report landings and production of commercial fish and shellfish to the three management agencies in Alaska (NMFS, Alaska Department of Fish and Game, and the

International Pacific Halibut Commission) through a single application. In the context of the Observer Program, eLandings provides a record of all trips that were taken during the year, which can be compared to the number of trips that were logged in ODDS. NMFS will implement changes to the eLandings system in 2016, to provide better linkage between ODDS and eLandings and improve data analysis (section 3.5).

3 2015 Deployment Methods

The North Pacific Observer Program uses a stratified hierarchical sample design where strata are defined through a combination of regulations and the annual deployment process. A multi-stage sampling design is used to sample the species composition of catch along with other catch components, such as biological information that is important for stock assessments. Both shoreside sampling methods (for salmon) and at-sea sample collections are nested within a trip. At-sea sampling methods follow a nested structure where samples are nested within hauls, and hauls are nested within trips.

A random selection of trips will be the sole method of assigning observers to at-sea fishing events in 2016. Trip-selection refers to the selection of the fishing trip as the sampling unit. Trip-selection is facilitated through the Observer Declare and Deploy System (ODDS). Vessels log their trips into ODDS by either using a website (http://odds.afsc.noaa.gov) or by calling the observer provider AIS at 855-747-6377.

3.1 At-Sea Selection Pools (strata)

The 2014 Annual Report recommended (NMFS 2015b), and the Council reiterated (Appendix A), that NMFS evaluate different sampling strata definitions for the 2016 ADP. Appendix B of the draft ADP (NMFS 2015a) contained this analysis, which is detailed in Faunce (2015a). The analysis found that sampling strata defined by gear type was a large improvement over the small and large-vessel trip sampling designs used in previous ADPs. Additionally, a gear-only stratification outperformed stratification schemes that were defined by both gear and FMP area (e.g., trawl in the GOA; trawl in the BSAI). Based on these results, NMFS will implement gear-specific sampling strata for 2016. Separate sampling strata will be defined for trawl, hook-and-line, and pot gear. The small- and large-vessel trip strata used in the 2014 and 2015 ADPs will not be used in 2016. Instead, vessels 40 ft LOA and larger will be part of the same gear-specific sampling strata. For example, all hook-and-line vessels 40 ft LOA and larger who are in partial coverage will have the same sampling rate.

In 2016, the following observer deployment strata will be in place for vessels in the partial observer coverage category (50 CFR 679.51(a)):

- ***No selection Pool*:** The "no selection" pool is comprised of vessels that will have no probability of carrying an observer on any trips for the 2016 fishing season. These vessels are divided into two categories:
    - Fixed-gear vessels less than 40 ft LOA and vessels fishing with jig gear, which includes handline, jig, troll, and dinglebar troll gear.

- *Electronic Monitoring (EM) selection pool*: Fixed gear vessels that have opted-into the EM selection pool (see Appendix C). For 2016, 58 fixed-gear vessels 40-57.5 ft LOA have chosen to participate in the EM selection pool and will carry EM systems as described in the EM Pre-Implementation Plan[2]. An additional three vessels >57.5 ft LOA have volunteered to carry stereo camera equipment and will also be placed in the no selection pool.

- ***Trawl trip-selection pool*:** This pool is comprised of all catcher vessels in the partial coverage category fishing trawl gear.

- ***Hook-and-line trip-selection pool***: This pool is comprised of vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing hook-and-line gear.

- ***Pot trip-selection pool***: This pool is comprised of vessels in the partial coverage category that are greater than or equal to 40 ft, LOA that are fishing pot gear.

3.2 Projected At-Sea Deployment (sample size)

There are three elements that NMFS uses to determine selection rates for at-sea deployment of observers: 1) the stratification scheme to determine the proportion of deployments that will occur in each sampling pool; 2) estimates of anticipated fishing effort to determine sample size; and 3) available sea-day budget.

The Appendix B of the draft 2015 ADP (NMFS 2015a, Faunce 2015a) evaluated two allocation methods, proportional and optimal, to determine the proportion of deployments that will occur in each sampling pool. Based on this analysis, NMFS proposed and the Council agreed to implement an optimal allocation strategy in 2016. This strategy results in allocation weightings between the trip-selection pools as: 0.51 for trawl, 0.34 for hook-and-line, and 0.15 for pot (Table 1). It is important to note that allocation weightings are not the same as deployment rates. Allocation weightings sum to 1 and are the proportion of the total number of observed trips (e.g. observer deployments) that are expected to occur in each trip-selection pool.

The second piece of information used to determine deployment rates was an estimate of anticipated fishing effort. Appendix B provides an analysis of trends of past fishing effort and an estimation of anticipated effort for 2016. The analysis differs from the method used in previous ADPs where future fishing effort was assumed to be equal to the most recent year of past data (e.g., 2014 was assumed to be the same as 2012, 2015 was assumed to be the same as 2013, etc.). In the analysis prepared in Appendix B, fishing effort for vessels in partial coverage was compared for 2013-2015. Fishing effort (days) from trips that fished with hook and line and pot gear has remained relatively steady since 2014. In comparison, fishing effort from trips that fished with trawl gear has steadily increased from 5,101 days in 2013, to 6,610 days in 2014, to 7,572 days in 2015 (Figure B-1). To further evaluate the increase in trawl, a linear regression model was constructed from the trawl fishing, which predicted 9,130 fishing days in 2016. This estimate was then adjusted to 7,772 fishing days based on information from the pollock stock

[2] Available at: http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/EM2016Plan915.pdf

assessment and the proportion of the Total Allowable Catch that has been utilized in the past 2 years (Figure B-2).

The final element used to determine deployment rates is the anticipated budget for the upcoming year. For the 2015 ADP, the at-sea budget for the deployment of observers in 2016 was set at 5,107 days. NMFS anticipates the budget for 2016 deployment to be approximately $4.5M, of which $3.9M is projected revenue from the fees for the 2015 calendar year[3]. The remaining funding includes fees carried over from 2015 and federal funds from NMFS. This budget is lower than the $4.2M that was projected in the draft ADP (NMFS 2015a) and reflects updated information about projected fees and the amount of funds that will be carried over from 2015.

NMFS uses the estimates of anticipated fishing effort and available sea-day budget as the primary inputs into simulation models used to generate anticipated outcomes from different selection rates. Sample size and resulting coverage rate estimates were generated through simulation following the approach used for previous ADPs in which each simulation trial mimics an ADP selection draw for the year (Appendix B). Each vessel in the three pools of the partial-coverage fleet does not undertake identical numbers of trips and days in a year; the simulation approach provides NMFS with a full range of potential outcomes from random sampling (selections) of different vessels and trips. The simulated deployment rate was determined from an evaluation of estimated annual program costs assessed against the risk of exceeding the Observer Program's available funds. NMFS estimates that 1,263 trips will be observed for 2016 in the partial coverage category (Table 1) and the deployment rates for the trip-selection strata in 2016 are:

- Trawl – 28%
- Hook and Line – 15%
- Pot – 15%

Table 1. Summary of deployment rates, allocation weights (based on Faunce 2015a), and the number of trips expected to be observed in each stratum in 2016. See Appendix B for more detail.

Stratum	Deployment Rate	Allocation Weight	Number of trips expected to be observed
No-selection Pool	0.00	0.00	0
Trawl Trip-selection Pool	0.28	0.51	644
Hook-and-line Trip-selection Pool	0.15	0.34	428
Pot Trip-selection Pool	0.15	0.15	191
Total		1.00	1,263

[3] As in previous years, funding the partial coverage contract is contingent upon the Office of Management and Budget releasing observer fee collections in time to fund the next option period. The partial coverage observer contract awarded to AIS in April 15, 2015 was for a year and four option years. The observer fees became available the end of May and the first year was funded on June 17, 2015 to cover the period from June 17, 2015 to June 16, 2016. Additional option years must be awarded by June 17 of each year to fund the following year's observer sea days. Since the contract years span calendar years, funding for sea days from January- June 2016 is included on the current year's contract for which funds have already been obligated, and sea days from June 17- December 31, 2016 will be purchased under a new option year on the contract on June 17, 2016.

3.3 Changes to the Observer Declare and Deploy System (ODDS)

Based on feedback from the OAC and recommendations from the Council, NMFS will not make changes to the Observer Declare and Deploy System (ODDS) in 2016. NMFS will maintain: the ability for vessels to log three trips in advance; and programming that releases the third consecutively selected trip from observer coverage for fixed-gear vessels 40-57.5 ft LOA.

3.4 Conditional Release Policy

For 2016, NMFS will not grant any conditional releases or temporary exemptions to any vessels subject to observer coverage[4].

Instead of granting conditional releases, NMFS will mitigate the impact of human observation on vessels through the 2016 EM Pre-Implementation Plan by placing vessels into the EM selection pool with no requirement to carry an observer. Vessels that had received a conditional release or temporary exemption in previous years (2013, 2014, and 2015) had an opportunity to opt-in to the EM selection pool and were given priority to participate in the EM research (Appendix C).

3.5 Changes to the eLandings electronic reporting system

Starting in 2016, the eLandigns system will have a field where the ODDS trip number can be entered on a groundfish landing reports. When vessels log trips in ODDS they are given an ODDS trip receipt with a unique trip number. When landing reports are entered in eLandings at the end of the trip, the vessel operators will provide their ODDS trip number so that it can be entered on the landing report. Having ODDS trip numbers entered on groundfish landing reports will facilitate data analysis and provide better linkage between ODDS and eLandings.

3.6 Chinook Salmon Sampling in the Gulf of Alaska

Genetic sampling of Chinook salmon in the GOA remains a priority for NMFS in 2016. This priority follows the implementation of Amendment 93 to the GOA FMP (77 FR 42629, July 20, 2012), which required all vessels fishing for pollock in the central and western GOA to retain salmon until delivery to a processing facility. There have been several iterations of the sampling design used to obtain genetic samples from salmon bycatch for the purposes of stock of origin (Faunce 2015b). The sampling protocol for Chinook salmon that was established in the 2014 ADP (NMFS 2013a) and continued under the 2015 ADP (NMFS 2014b) will remain in effect for 2016. Trips that are randomly selected for observer coverage that occur in the GOA pollock fishery will be completely monitored for Chinook salmon bycatch by the vessel observer during offload of the catch at the shoreside processing facility. Outside of the pollock fisheries, tissues will be obtained from all salmon found within observer at-sea samples of the total catch. These genetic samples are important for the management of Chinook PSC and are used by the Alaska Fishery Science Center (AFSC) to identify the stock of origin of Chinook salmon caught as bycatch in groundfish fisheries (e.g. Guyon et al. 2015).

3.7 BSAI Voluntary Full Coverage Compliance Agreement

Since 2013, NMFS has provided trawl vessels fishing for Pacific cod an option to carry an observer at all times when fishing in the BSAI. The additional coverage benefits the

[4] On rare occasion, when the observer provider AIS is unable to deploy an observer to a port within the 72 hour window, AIS, in coordination with NMFS, may provide a release to the vessel. This process will continue on a case-by-case basis in 2016.

management of that fishery and reduces the population of trips in the partial coverage category, thus increasing the coverage rates for the trips remaining in partial coverage.

NMFS is extending the voluntary full coverage option through 2016. However, NMFS and the Council have recognized that this would be best addressed in the long-term through a regulatory amendment. A separate action is being considered by the Council to move BSAI trawl vessels into the full coverage category. Since the regulatory change will not be in place in 2016, entities participating in the BSAI Pacific cod trawl fishery that want full coverage in 2016 must submit a signed compliance agreement to NMFS on or before December 1, 2015 (Appendix D). As of December 1, 27 vessels signed a compliance agreement for 2016. Vessels operating under a full coverage compliance agreement would pay partial coverage observer fees as required in regulation, but would also need to contract directly with observer providers and also directly pay for those observer costs. In addition, vessels operating under the full coverage compliance agreement must comply with the partial coverage regulations, including logging trips into ODDS.

4 Communication and Outreach

NMFS will continue to communicate the details of the ADP to affected participants through letters, public meetings, and posting information on the internet[5]. Outreach activities will be held in the fall of 2015 and winter of 2016 to inform industry participants affected by changes to observer deployment in the 2016 ADP, and to also inform industry about ongoing work on the EM cooperative research plan to integrate EM into the existing research plan. The dates and suggested meeting locations are listed in Table 2.

Pending Observer Program staff availability and local interest, staff are available upon request for additional meetings through teleconference and/or WebEx. A community partner would be needed to organize a location and any necessary equipment to facilitate additional meetings. To request a meeting date or location, or to suggest a topic for discussion, please contact Chris Rilling at (206) 526-4194.

Table 2. Public outreach meeting locations and schedule.

Location	Date
Homer	Nov 4, 2015
Seattle, Pacific Marine Expo	Nov 18-20, 2015
WebEx Demo (Processors and Vessels)	Dec 2, 2015
Anchorage, NPFMC Meeting (Evening Session)	Dec 9, 2015
Petersburg	Dec 10, 2015
Sitka	1st week of March, 2016
Kodiak, ComFish	April, 2016

[5] Information is available at http://www.alaskafisheries.noaa.gov/sustainablefisheries/observers/default.htm and Frequently Asked Questions (FAQs) are available at http://alaskafisheries.noaa.gov/sustainablefisheries/observers/faq.pdf..
For FAQs regarding ODDS go to http://odds.afsc.noaa.gov and click the "ODDS FAQ" button.

5 References

NMFS (National Marine Fisheries Service). 2013a. 2013 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska. 39 pp plus appendices. http://alaskafisheries.noaa.gov/sustainablefisheries/observers/ADP_Final_2013.pdf.

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6 List of Preparers and Contributors

Craig Faunce, Alaska Fisheries Science Center (AFSC)
Jason Gasper, Alaska Regional Office (AKRO)
Jennifer Mondragon, AKRO
Alicia Miller, AKRO
Chris Rilling, AFSC

With contributions from:
Glenn Merrill, AKRO
Sally Bibb, AKRO
Elizabeth Chilton, AFSC

Appendix A. Council motions on the Annual Report and Draft 2016 Annual Deployment Plan

Council motion from June 8, 2015 on agenda item C-4 Observer Annual Report

The Council approves the following recommendations in the development of the draft 2016 Annual Deployment Plan and future annual reports, including consideration of SSC comments:

- Provide additional information on observer rates and percent coverage by gear type, in addition to numbers of trips and deployment. Report the percentage and metric tons of total catch observed (Table 4-2 and subsequent). Track these key metrics over time in each annual report. (OAC)

- Identify the best approach to a trip identifier tied to landings data to provide a linkage between ODDS and eLandings and improve data analysis, including those trips delivered to a tender. (OAC/SSC)

- Evaluate and suggest modifications to ODDS to reduce temporal bias associated with the policy of allowing trip cancelation and logging multiple trips prior to departure. (OAC and SSC)

- The Council appreciates the development of performance metrics and encourages NMFS to continue to develop tools to evaluate both the reliability of the data and deployment performance.
    - Include information on observer sampling such as percent of hauls observed vs total hauls/trip, and number of hauls with complete observer data vs partial data by vessel size and gear. (OAC)
    - Continue to develop ways to evaluate observer effects, including possible examination of potential associations of PSC with trip attributes on observed vessels. If associations are found, PSC rates in shoreside offloads from unobserved vessels could be compared for evidence of bias. (SSC)
    - Continue evaluation of and improvements in catch and bycatch estimation, including the necessary procedures for calculating the variances associated with point estimates. Consider SSC suggestions on a starting point for assessing variance. (OAC and SSC)

- Assess inefficiencies in the program and evaluate ways to achieve cost efficiencies in the partial coverage category within the existing 5-year contract. (OAC)

- Include information about the availability of fixed gear lead level 2 observers. (OAC)

- Incorporate some additional quantitative measures in the enforcement section of the report, especially in relation to trends by incident type. (OAC)

- The 2016 ADP should explore defining strata to deploy observers by gear (longline, pot, and trawl gear) and FMP area and, if necessary, consider operational sector (CV vs CP).

In addition, the Council supports continued outreach by enforcement personnel regarding observer issues, especially to vessels where captains are under increasing pressure to monitor PSC. (OAC)

Council motion from October 10, 2015 on agenda item C-6 Observer Annual Deployment Plan

The Council recommends the following for the draft 2016 Annual Deployment Plan:

- Use the trip-selection method to assign observers to vessels in partial coverage in 2016.

- Deploy observers in the trip-selection pool by gear in 2016, with optimal allocation. Support the following preliminary coverage rates resulting from this stratification:

  Trawl (29%)
  Longline (14%)
  Pot (14%)

  The no selection pool would include catcher vessels <40ft LOA; vessels fishing with jig gear; and fixed gear vessels that participate in the 2016 electronic monitoring (EM) cooperative research.

- No temporary exemptions from observer coverage are allowed due to insufficient life raft capacity, given the option for these vessels to be in the electronic monitoring pool in 2016.

- Continue the policy (programming in ODDS) that prevents a 40 – 57.5' fixed gear vessel from being selected for a third consecutive observed trip.

- Maintain the ability for vessels to log up to three trips in advance in ODDS.

- Modify eLandings to enable the ODDS trip number to be entered voluntarily on groundfish landing reports to facilitate data analysis and provide a better link between ODDS and eLandings.

- Maintain the current Chinook salmon sampling protocols to identify stock of origin.

- Allow BSAI cod trawl catcher vessels to opt-in to full coverage and carry an observer at all times when fishing in the BSAI.

- Continue to conduct outreach in fall and winter 2015/2016, with efforts to meet in Kodiak earlier than the proposed April 2016.

The Council also supports the OAC's recommendations with regard to the status of analytical projects related to the observer program.

The Council requests that Observer Program staff evaluate different weighting schemes in the sampling design based on gear with optimal allocation, such that discards are weighted more heavily than retained catch, for the draft 2017 annual deployment plan.

Appendix B. Calculation of the Selection Rate for the final 2016 Annual Deployment Plan

Introduction

Following the NMFS recommendation first put forth in the 2013 Annual Report (NMFS, 2014) and adopted in the 2015 Annual Deployment Plan (ADP), the Final 2016 ADP specifies that the method known as "trip-selection" be the sole method of assigning observers within the 'partial-coverage' category of the fleet (i.e., the portion that is sampled). Trip-selection is accomplished through the Observer Declare and Deploy System (ODDS). Trip-selection members are sent a letter prior to the start of the calendar year with their username and password so that they may access the ODDS and log planned fishing trips. Each logged trip is assigned a random number of four digits as low as 0 and up to and including 1 (e.g., 0.0000, 0.1234, 1.0000, etc.). This random number is evaluated against a pre-programmed selection rate. If the random number is below or equal to the selection rate the trip is selected for observation, otherwise it is not. For this reason, a selection rate is required prior to the start of the year for which trips are going to be logged. This appendix describes how those rates were calculated for the 2016 Final ADP.

The Annual Report and ADP process provides a mechanism for NMFS and the Council to re-evaluate deployment and improve efficiency in the sampling design. In the most recent Annual Report (NMFS 2015a), the NMFS recommended that future ADPs explore alternative ways to subdivide the population of partial coverage trips. The corresponding SSC report added that such an endeavor will require estimates of uncertainty and likely involve tradeoffs among the multiple performance measures produced by the observer program (NPFMC 2015). The 2016 Draft ADP contained an analysis of alternative stratum definitions and sample allocations for the deployment of observers into the fleet of vessels in partial coverage (NMFS 2015b). For the Draft 2016 ADP, NMFS proposed that the sample design for observer deployment be defined in units of trips stratified by three gear types with sample sizes allocated according to a blended optimal allocation strategy. At its October 2016 meeting, the Council supported this design for the final 2016 ADP. In this Final ADP, the three strata were defined as: hook and line, pot, and trawl gear, with allocation weightings (A) of 0.339, 0.151, and 0.510 respectively (Table 1, NMFS 2015b). Allocation weightings are not the same as deployment rates. Allocation weightings sum to 1, and reflect the proportion of the total number of observer deployments (hereafter observed trips) that should occur in each stratum. Therefore, this analysis sets observer coverage rates such that 33.9% of the total observed trips are in the hook and line stratum, 15.1% of the total observed trips are in the pot gear stratum, and 51% of the total observed trips are in the trawl gear stratum.

Methods and Results

All analyses were performed using the R language for statistical computing (R Core Team, 2014) following the general procedures used in previous Annual Deployment Plans (i.e., the selection of appropriate deployment rates and the generation of "risk-profiles" of not realizing a budget target).

Data preparation

Data developed by the staff of the Sustainable Fisheries Division of the Alaska Regional Office and the Fisheries Monitoring Division of the Alaska Fisheries Science Center for the Draft 2016 Annual Report (NMFS 2015b) were used in this analysis. Briefly, these data consist of species-specific catch amounts, fishing dates, locations, catch disposition, observation status, and associated ADP strata. These data were reduced to year, ending date for the trip, stratum (as defined by the three gear design from the draft 2016 ADP), and the number of days in the trip. As in past ADPs, trip data were altered to reflect the expected fishing under partial coverage in the upcoming year in the following way: (1) an additional day was added to trips that occurred in the trawl pollock fishery to account for the additional cost of monitoring associated offloads for salmon bycatch and genetic tissue collections[6], (2) past fishing activity by nine CPs in the second half of the year were labeled as belonging to the partial coverage category, and (3) vessels with no probability of selection were removed from the analysis (i.e., all trips corresponding to hook and line and pot gear on vessels < 40' LOA, vessels fishing jig gear, and vessels anticipated to participate in electronic monitoring).

Four modifications to the trip data were made between the Draft 2016 ADP and the Final 2016 ADP. First, fishing effort corresponding to the partial coverage fleet of 2015 (as of October 25th) were added to the data used in the Draft 2016 ADP (2013 and 2014 data). Second, past partial coverage activities by AFA catcher vessels that volunteered for full coverage during the 2015 BSAI Pacific cod fishery were relabeled as belonging to the full coverage category and assumed to represent the 2016 portion of the fleet that undertakes this activity. This is different from the Draft 2016 ADP which assumed the *2014* list of voluntary full coverage vessels represented the likely list of such vessels in 2016. This decision to use 2015 data was made after comparing the participating vessel lists for the past three years. The number of vessels participating in voluntary full coverage over the past few years has declined from 41 in 2013, to 38 in 2014, to 32 in 2015, and only 28 vessels have volunteered for full coverage in 2016 as of December 1st, 2015. The third change between the Draft and Final version of the 2016 ADP data is that the list of vessels expected to participate in the "2016 EM Selection Pool" increased from 56 to 61. Finally, four of the 1,482 trawl trips that occurred in 2013 had durations exceeding 30 days. These four trips were considered as outliers and were removed from the data since no other trip in 2014 or 2015 had such long durations and 2013 was the first time this database had been constructed.

Estimation of fishing effort in 2016

This analysis also differs from those used in the Draft 2016 ADP (and previous Final ADPs) in how future fishing effort is estimated. Previously, future fishing effort was assumed to be equal to the most recent year of past data (e.g., 2014 was assumed to be the same as 2012, 2015 was assumed to be the same as 2013, etc.). In this analysis, trends in past fishing effort were used to inform decisions as to whether or not to accept past assumptions in each gear stratum. The total number of fishing days in trips that would qualify as belonging to the partial coverage fleet of 2016 and ended their fishing trips by October 25th were compared among years (Figure B-1). Fishing effort (days) from trips that fished with hook and line combined with those that fished pot gear has remained relatively steady since 2014 (16,246 days in 2014 compared to 16,141

[6] More details on observer sampling methods for salmon bycatch in Faunce (2015).

days in 2015). In comparison, fishing effort from trips that fished with trawl gear has steadily increased from 5,101 days in 2013, to 6,610 days in 2014, to 7,572 days in 2015.

The steady increase in trawl fishing effort warrants forecasting with a simple model. A linear regression model was constructed from the trawl fishing effort data described previously, and used to calculate estimates for fishing effort between January 1st and October 25th for the years 2013-2016 (Table B-1). The forecasted trawl effort from this model for January 1st to October 25th 2016 time period was 8,899 days. Let this value be denoted as d_{TRW16}. Total fishing effort in days for 2016 in the trawl gear sector (D_{TRW16}) was calculated from the relationship between d_{TRW16} and the total number of fishing days in the trawl sector in 2014 (D_{TRW14}; eqn. 1):

$$D_{TRW16} = D_{TRW14} * \left(1 + \frac{d_{TRW16} - D_{TRW14}}{D_{TRW14}}\right). \quad (1)$$

Table B-1. Summary of actual and predicted fishing effort in the trawl sector for 2016. The value for D_{TRW16} in the last line is reported in boldface type.

Gear	Year	Total days Jan. 1 – Oct. 25		Total days for the year	
		Actual	Predicted (regression)	Actual	Predicted (eqn. 1)
TRW	2013	5,101	5,192	5,232	
TRW	2014	6,610	6,428	6,782	
TRW	2015	7,572	7,663		
TRW	2016		8,899		9,130

The value of 9,130 days for D_{TRW16} represents a 34% increase over D_{TRW14}. To gauge whether or not this is a realistic estimate we can look to the trends in available quota to this sector. One line of supporting evidence comes from the GOA pollock stock assessment. The 2016 ABC recommendation for pollock in the Gulf of Alaska west of 140° W lon. (W/C/WYK regions) is 254,310 t, which is an increase of 33% from the 2015 ABC (Dorn et al. 2015). Since in the GOA a trip limit exists for the GOA trawl pollock fishery, it can be expected that an increase in the number of fishing trips should also increase with available quota under the assumption that this available quota will be fully utilized. However, data from Dorn et al. (2015) indicate that the catch in the GOA pollock fishery has *not* been fully realized, and that this is most pronounced in the two most recent years (Table B-2).

Table B-2. Historical catch and allowable biological catch (ABC) / total allowable catch (TAC) in the Gulf of Alaska pollock fishery (source: Table 1.1 of Dorn et al. (2015)).

Year	Catch	ABC / TAC	Catch:TAC
2010	76,745	77,150	0.9948
2011	81,359	88,620	0.9181
2012	103,984	108,440	0.9589
2013	**96,353**	**113,099**	**0.8519**
2014	**142,633**	**167,657**	**0.8507**
Average (2013:2014)			**0.8513**

Therefore, the predicted value for D_{TRW16} from Table B-1 was multiplied by the average ratio of the Catch:TAC over the past two years in Table B-2. The new adjusted value for D_{TRW16} is 9,130 * 0.8513 = 7,772 (Table B-3).

Table B-3. Summary of original estimate of 2016 fishing effort in the trawl stratum and the final adjusted value accounting for the fact that the Gulf of Alaska pollock fishery catch has not equaled the available quota in recent years.

	D_{TRW16}
Predicted	9,130
Adjusted	**7,772**

A visual depiction of the actual, predicted, and adjusted values for D_{TRW} is presented in Figure B-2.

Since not all trips have the same number of days, a list of trawl fishing trips, each with its own unique number of days, was needed to represent fishing effort in this stratum for 2016. To accomplish this, the population of trips belonging to the trawl strata as defined in the Draft 2016 ADP from all years combined were sampled one at a time (without replacement) to generate a new list of trips to represent fishing in this strata for 2016. Sampling the 2013-2015 partial coverage trawl data to generate the list of 2016 trawl partial coverage fishing trips was continued until the total number of fishing days in the 2016 trip list was greater than 7,772 (D_{TRW16}). Let this list of trips be denoted as TRW16. Corresponding lists of trips for hook and line and pot gear (HAL16 and POT16 respectively) were derived from the partial coverage hook and line and pot fishing that occurred in 2014 since effort in these gear types did not increase from 2014 to 2015. The TRW16, HAL16 and POT16 trip lists, each with a number of fishing days, constituted the population of trips expected to occur in 2016 (POP16).

Determining deployment rates for 2016

The selection rate that can be afforded in the coming year depends on several factors. These include the amount of fishing that is expected to occur and the available budget. The available budget for 2016 was set equal to 5,107 days. This represents a 7.4% decline from 2014 and 2015 budgeted days (5,518)[7]. New to this analysis is an additional constraint on available sea-days; only 2,699 days are available for use between January 1st and June 17th, 2016[8]. This new constraint means that analyses of observer deployment rates need to be measured against both mid-year and end-of-year budgets.

As in past ADPs, the analysis of potential deployment rates was conducted in terms of trips, while the available budget for observer deployment is in units of days. A conversion rate (*CR*), calculated from the total number of trips divided by the total number of days was calculated for each stratum under the assumption that the conversion rates in the POP16 database are equivalent to those seen in past years. This assumption is especially important for the TRW16 data, since it was generated from a random selection of past trips. To evaluate the

[7] Budgeted days in ADPs are not equal to the number of days actually observed as reported in Annual Reports.
[8] as provided by the Fishery Monitoring Division of the AFSC.

appropriateness of the trip duration data in the trawl stratum, the TRW16 data were compared to the corresponding trip durations from past years. As expected, the TRW16 dataset was a good representation of past trip durations (Figure B-3).

As in past ADPs, the analysis of potential deployment rates was conducted through simulated sampling. Initial rates were determined by first calculating the number of trips afforded in the first half (FH) of the year (T_{16FH}; eqn. 2):

$$T_{16FH} = \frac{2{,}699}{\sum_{i=1}^{S} \frac{A_i}{CR_i}}, \quad (2)$$

(where A denotes allocation weightings), and subsequently calculating the number of trips afforded in each stratum (*S*) for the first half of the year (eqn. 3):

$$T_{16FH(S)} = A_S * T_{16FH}. \quad (3)$$

These values for the first half of the year were then converted to values for the entire year by first calculating the sampling rate (*R*) for each stratum (eqn. 4):

$$R_s = T_{16FH(S)} * E_{16FH(S)}, \quad (4)$$

(where $E_{16FH(S)}$ denotes the number of trips in the stratum for the first half of the year), and subsequently calculating the number of sampled trips for each stratum for the year (eqn. 5):

$$T_{16(S)} = R_S * E_{16(S)}. \quad (5)$$

The sum of $T_{16(S)}$ yields the total number of trips to be sampled for the year (T_{16}). The results of these calculations for the initial trial appear in Table B-4.

Table B-4. Summary of values used in the initial simulation of observer deployments.

Stratum	Total Trips	Total Days	Conversion Rate (*CR*)	Allocation Weighting	T_{16FH}	$T_{16FH(S)}$	$E_{16FH(S)}$	R_s	$T_{16(S)}$
HAL	2,777	13,144	0.211	0.339	696	236	1,355	0.174	484
POT	1,253	4,403	0.285	0.151	696	105	652	0.161	202
TRW	2,275	7,773	0.293	0.510	696	355	1,429	0.248	565

An initial estimate of 1,251 trips were estimated to be sampled for 2016 (sum of last column in Table B-4). Stratified random sampling without replacement of the POP16 trip data with sample sizes for each stratum set equal to $T_{16(S)}$ constituted one trial of one simulation. In each trial, the total number of days in sampled trips was summed for both the first half of the year and for the entire year, and compared to the available sea days for the first half of the year and the entire year respectively. A total of 1,000 trials were conducted for each simulation.

Upon examination of the results of the trials from the first simulation, it was determined that the number of trips that could be sampled for the year could be increased beyond those presented in

Table B-4. Therefore, 20 versions of the simulations were conducted. The following was conducted in each successive version: the total number of trips that could be sampled was incrementally increased by 2 to yield a new value for T_{16}, corresponding values for $T_{16(S)}$ were re-calculated from equation 6:

$$T_{16(S)} = A_S * T_{16FH}\ , \qquad (6)$$

and 1,000 new trials were conducted. The results from each simulation increment is presented in Figure B-4, and summaries of these plots are presented in Table B-5. Based on these results, the rates resulting from the sixth increment are recommended for use in the final 2016 ADP since they represent rates that, on average, should result in a minimum number of remaining days in the available budget for the first half of the year, and are a compromise between the risk of deploying at rates that result in the observer program spending more-or-less than available budgets (Success FH = 0.50). For clarity, these recommended rates and the expected number of observed trips in each stratum are presented in Table B-6.

The distribution of expected budgets for the first half of the year and the full year of 2016 from the selected iteration (iteration 6) are presented in Figure B-5. It is estimated that 1,263 trips will be observed in 2016. This compares with 1,237 trips estimated in the Draft 2016 ADP (sum of n_h in Table 1, NMFS 2015b).

Risk of going over-budget

The lower panel of Figure B-5 is presented as a risk-profile plot in which the expected difference between the available budget and the expended budget is expressed in terms of the proportion of trials with greater or smaller values (Figure B-6). The median (50^{th} percentile) expectation for 2016 is a sea-day budget expenditure of 4,900 days, resulting in a savings of 207 days. No trials had sea-day budgets that exceeded available sea-day budgets for 2016. The maximum budget among trials was 5,098 total days.

Table B-5. Summary of the results from simulation increments. 'Success' refers to the proportion of trials in which the total number of sampled days was below the available budget. Based on these results, the fourth increment (I) results are those recommended for the Final 2016 ADP and are depicted in bold. Symbols are as follows: D = Total days sampled, DR = Days Remaining in budget after sampling, FH = First half of Year, HAL = Hook and line gear stratum, POT = Pot gear stratum, T_{16} = trips expected to be sampled in 2016, TRW = Trawl gear stratum, YR = Year.

	Average				Success			Deployment Rate		
I	D_{FH}	DR_{FH}	D_{YR}	DR_{YR}	FH	YR	T_{16}	HAL	POT	TRW
1	2674	25	4859	248	0.62	1.00	1253	0.1530	0.1508	0.2809
2	2682	17	4867	240	0.59	1.00	1255	0.1530	0.1516	0.2813
3	2685	14	4876	231	0.57	1.00	1257	0.1534	0.1516	0.2818
4	2689	10	4886	221	0.55	1.00	1259	0.1538	0.1516	0.2822
5	2692	7	4886	221	0.53	1.00	1260	0.1538	0.1516	0.2826
6	**2700**	**-1**	**4900**	**207**	**0.50**	**1.00**	**1263**	**0.1541**	**0.1524**	**0.2831**
7	2702	-3	4905	202	0.49	1.00	1265	0.1545	0.1524	0.2835
8	2704	-5	4914	193	0.48	1.00	1267	0.1548	0.1524	0.2840
9	2710	-11	4920	187	0.44	0.99	1269	0.1548	0.1532	0.2844
10	2713	-14	4930	177	0.44	1.00	1271	0.1552	0.1532	0.2848
11	2715	-16	4936	171	0.40	1.00	1273	0.1556	0.1532	0.2853
12	2726	-27	4945	162	0.38	0.99	1275	0.1556	0.1540	0.2857
13	2728	-29	4955	152	0.37	0.99	1277	0.1559	0.1540	0.2862
14	2728	-29	4954	153	0.36	0.99	1279	0.1563	0.1540	0.2866
15	2732	-33	4961	146	0.34	0.98	1280	0.1563	0.1540	0.2870
16	2741	-42	4972	135	0.29	0.98	1283	0.1566	0.1548	0.2875
17	2747	-48	4987	120	0.27	0.94	1285	0.1570	0.1548	0.2879
18	2747	-48	4988	119	0.26	0.96	1286	0.1570	0.1548	0.2884
19	2755	-56	4998	109	0.25	0.94	1289	0.1574	0.1556	0.2888
20	2752	-53	5006	101	0.24	0.92	1291	0.1577	0.1556	0.2892

Table B-6. Summary of recommended deployment rates, allocation weights (*A*) from the Draft 2016 ADP, and the number of trips expected to be observed in each stratum ($T_{16(S)}$).

Gear Stratum (*S*)	Deployment Rates	*A*	$T_{16(S)}$
HAL	0.1541	0.339	428
POT	0.1524	0.151	191
TRW	0.2831	0.510	644
Total (T_{16})		1.000	1,263

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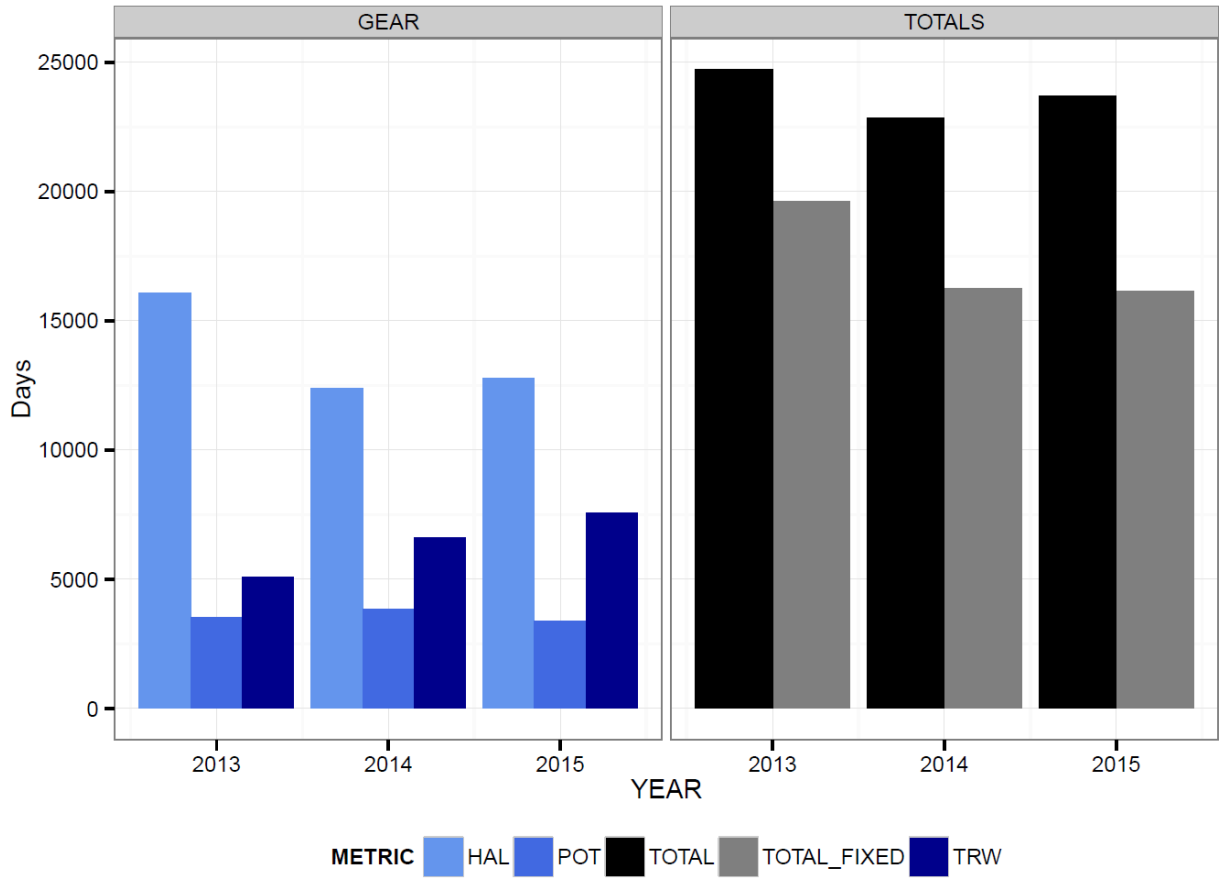

Figure B-1. Trends in partial coverage fishing effort (total fishing days) by the three gear strata defined in the draft 2016 ADP (HAL = hook and line, POT = pot gear, TRW = trawl gear) that ended between January 1st and October 25th of each year. TOTAL_FIXED = HAL and POT combined. Total fixed gear has remained steady between 2014 and 2015, while trawl gear effort has steadily increased.

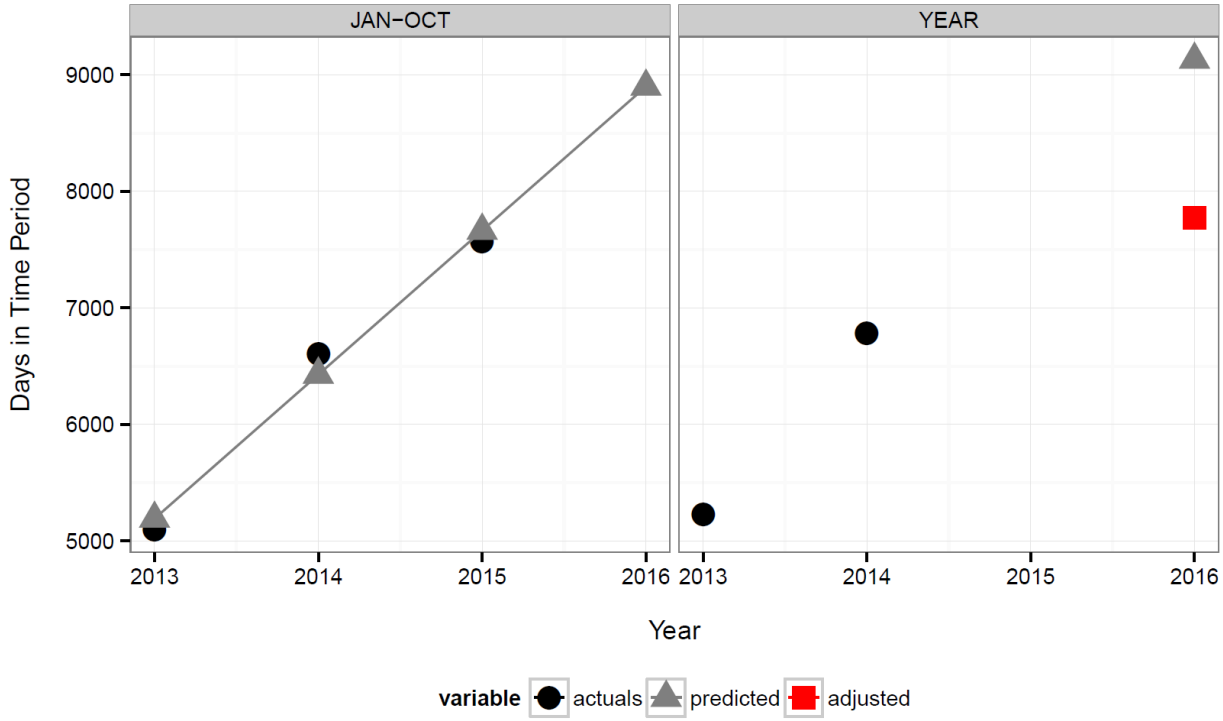

Figure B-2. Visual depiction of the actual, predicted, and adjusted fishing effort in the Trawl gear stratum. Predicted values for the January – October (JAN-OCT) period was determined with linear regression, while the same value for the entire year (YEAR) was estimated from equation 1. The final adjusted value for 2016 is based on the assumption that only 85% of the predicted effort will be realized (note: vertical y-axis does not begin at 0).

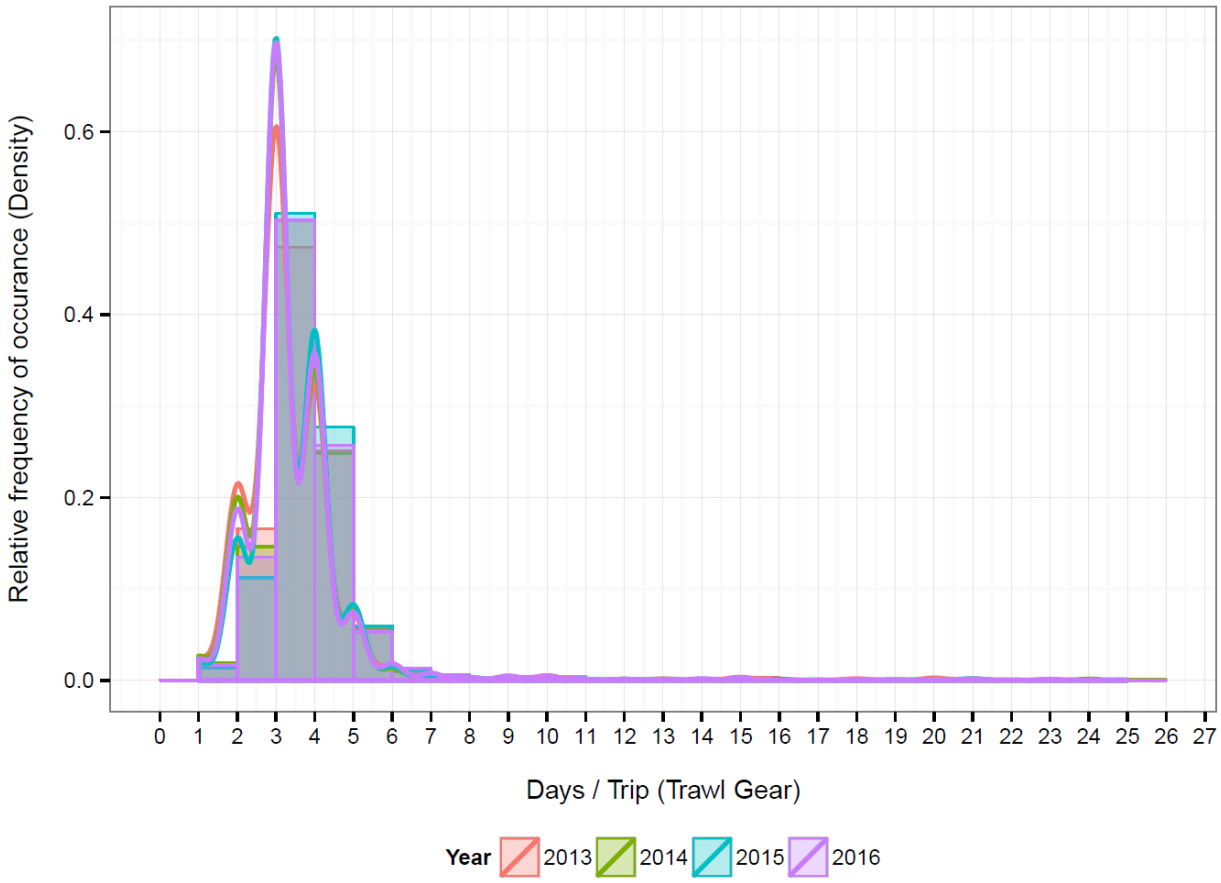

Figure B-3. Histogram of trip durations in the trawl stratum as defined in the Draft 2016 ADP. Values denoted as belonging to 2016 are those that resulted from random selection of past trips (TRW16 in text). Density splines show peaks at each day while the bar charts are offset to the right.

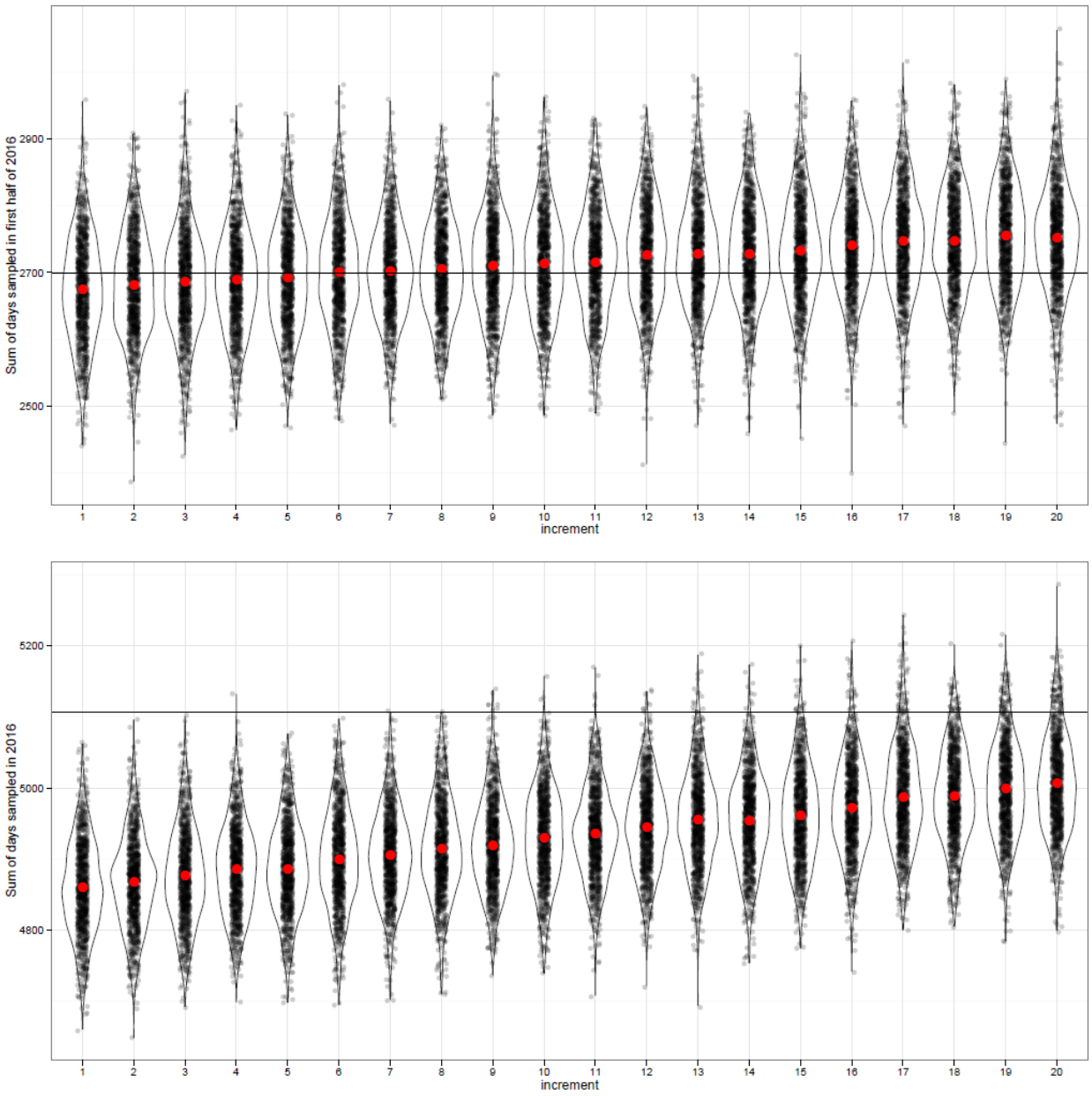

Figure B-4. The total number of days expected from simulation to be observed in the first half of 2016 (top panel) and the entire calendar year of 2016 (bottom panel) for 20 incremental increases in the total number of trips in which observers were deployed. For each increment, the outcome of a single trial is depicted as a black dot. The average of the 1,000 trials for each increment are depicted as red dots. The number of outcomes are expressed by the width of the oval for each increment. In this way, the mean is a good approximation of the most likely outcome. The black horizontal line represents the available budget.

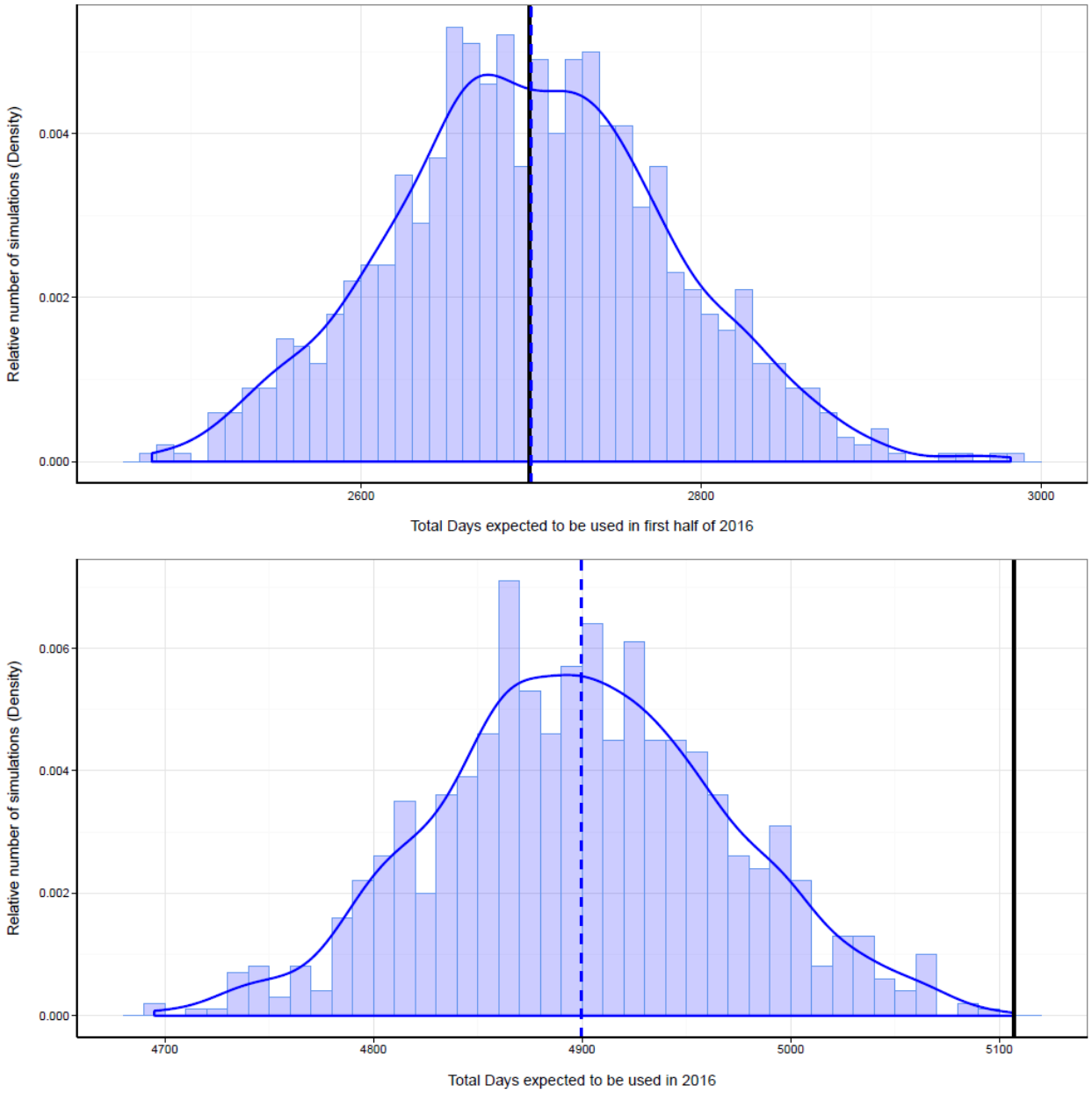

Figure B-5. Summary of 1,000 outcomes of simulated sampling from the preferred increment (increment 6) showing the expected number of observed days for the first half (top panel) and entire year of 2016 (lower panel). Dashed lines denote average outcomes from the simulations while the solid black line depicts the number of days corresponding to the available budget.

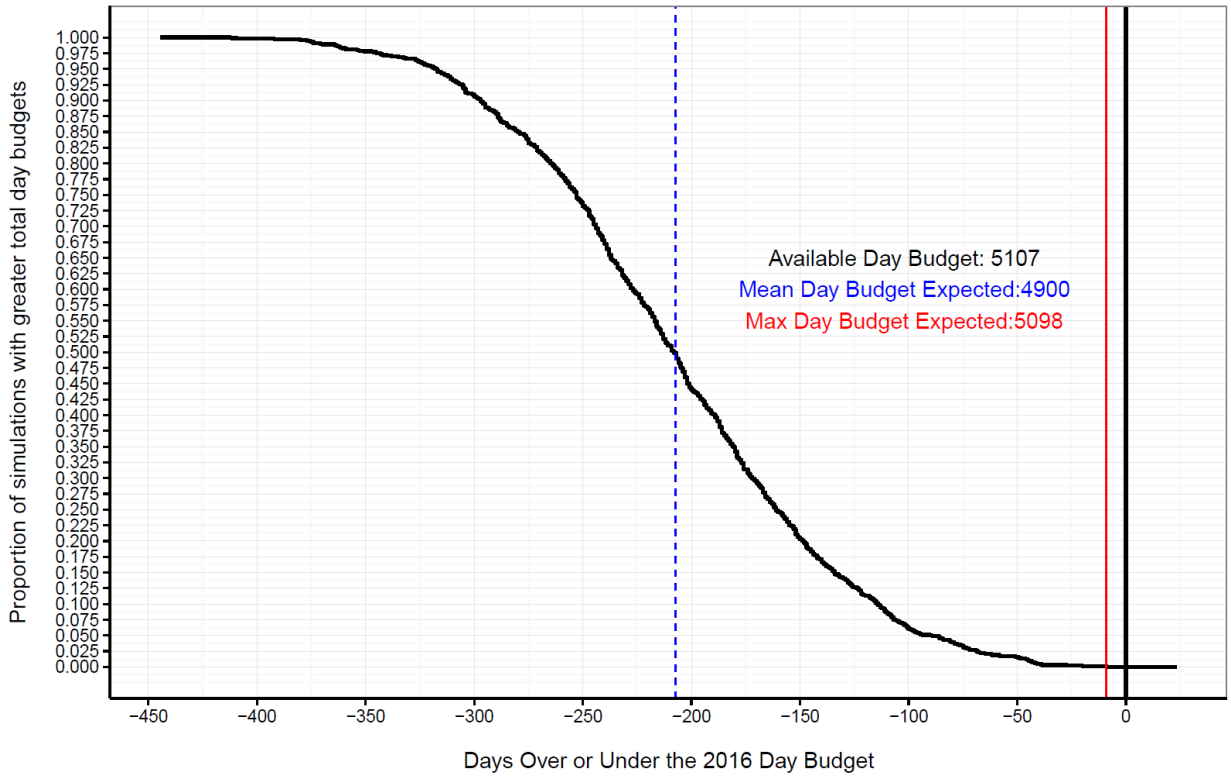

Figure B-6. The percentage of 1,000 simulations with annual observer day budgets greater than the available budget of 5,107 days. The horizontal x-axis has been adjusted to reflect the days in a given simulation trial relative to the available budget. The mean outcome is depicted in the blue dashed line, the available budget is depicted by the black solid line, and the maximum outcome is depicted by the vertical red line to the right.

Appendix C. Electronic Monitoring (EM) Pre-Implementation Plan Opt-In Letter

In 2014, the North Pacific Fishery Management Council established an Electronic Monitoring (EM) Workgroup as a Council committee, to allow industry, agency, and EM service providers a forum to cooperatively and collaboratively design, test, and develop EM systems that are consistent with Council goals and objectives to integrate EM into the Observer Program[9]. Multiple research tracks are being undertaken under the EM cooperative research plan in order to collect information that will help inform future Council alternatives for EM to enable catch estimation.

At their October meeting, the Council approved the 2016 EM Pre-Implementation Plan[10] as recommended by EM Workgroup. The plan defines EM deployment in 2016 for vessels that meet the Council's priority criteria, namely longline vessels, 40-57.5 feet length overall (LOA) that have trouble carrying an observer due to insufficient life raft or bunk space capacity. The EM Workgroup proposed a 60-vessel EM pool for these vessels in 2016; with four deployment time-periods and a 30% target coverage level in each deployment period. Vessels participating in the EM pool will be placed in the "No Selection Pool" for human observer coverage in 2016.

As part of the pre-implementation process, the EM Workgroup recommended that NMFS send a letter to the fixed gear vessels requesting them to indicate if they were interested in participating in the 2016 EM pre-implementation program. The following "opt-in" letter was sent to all 40-57.5 ft LOA fixed gear vessels indicating that priority would be given to vessels that had been granted temporary exemptions and conditional releases for insufficient life raft capacity or bunk space.

As of August, 2015, 57 vessels fixed gear vessels 40-57.5 ft LOA had responded to the letter[11]. In October 2015, NMFS sent a second letter along with a copy the 2016 EM Pre-Implementation Plan to the 57 vessel owners describing their responsibilities while participating in the EM selection pool. The opportunity to participate in the EM selection pool was also announced in the Council's October newsletter[12] and a deadline of Nov 20, 2015, was established for vessels to make a choice. Two vessels chose to opt-out of the 2016 EM selection pool and three new vessels chose to opt-in. As of December, 58 vessels have chosen to participate in the EM selection pool and will carry standard cameras as described in the EM Pre-Implementation Plan. An additional three vessels >57.5 ft have volunteered to carry stereo camera equipment and will also be placed in the zero selection pool.

[9] More information about the EM Workgroup is available on the Council's website: http://www.npfmc.org/observer-program/
[10] 2015 Pre-Implementation Plan available at: http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/EM2016Plan915.pdf
[11] Characteristics of the vessels is available at: http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/EM%20Selection%20Pool%20Opt-In%20Characteristics.pdf
[12] The newsletter is available on the Council's website: http://www.npfmc.org/wp-content/PDFdocuments/newsletters/news1015.pdf

----------Example of EM Pre-implementation Plan Opt-In Letter----------

May 18, 2015

Dear Vessel Owner,

The North Pacific Groundfish and Halibut Observer Program is seeking vessels to participate in the 2016 electronic monitoring (EM) Cooperative Research Project to collect data on board commercial fishing vessels. The goal of the research is to determine whether data collected using EM technologies can be used to estimate catch and whether this can be achieved in a cost-effective and sustainable manner. We request that you let us know of your interest to "opt-in" to the 2016 EM selection pool by July 27, 2015. Since vessels will be given a choice to opt-in for the EM pool or remain part of observer selection pool the Council may reconsider if any of the current observer exemption rules remain such as life raft capacity. Any vessel that does not opt-in by July 27 will likely not be eligible for the EM pool in 2016 and will be required to participate in the partial observer coverage pool per Federal regulations.

The National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (Council) have yet to determine the number of vessels that will be eligible to be in the EM selection pool. NMFS and the industry continue to seek additional funds to support the EM program and the number of vessels that will be selected to participate will depend on the amount of funding received. However, any owner that is interested in participating should let us know their preference to participate.

Priority will be given to vessels that meet the following criteria:

A. Hook and line vessels 40 to 57.5 feet in length;
B. Vessels granted a conditional release for insufficient life raft capacity or limited bunk space in 2013 or 2014;
C. Vessels granted temporary exemptions for limited life raft capacity in 2015, or that might be eligible for a life raft exemption in 2015. Eligibility is based on consistent fishing history with a crew of 4 including the vessel master, and a 4-person life raft;

NMFS will select vessels that meet these criteria and have contacted FMA to opt-in to create the EM selection pool. All vessels that are participating in the 2016 EM selection pool will not be required to carry a human observer for the entire 2016 fishing year.

A 2016 EM Pre-Implementation Plan will provide comprehensive details on the EM cooperative research program for 2016. The EM Pre-Implementation Plan is expected to be completed during the summer of 2015 and presented to the Council at the October 2015 meeting. The plan will include specific criteria for vessel participation and other operational details to ensure effective deployment of EM systems in 2016. Once the EM Pre-Implementation Plan is approved by the Council, NMFS will notify owners of vessels that are selected for the EM pool with more details about the 2016 EM cooperative research in November 2015. Vessels will be given an opportunity to opt-out of the EM cooperative research prior to the start of the fishing year, but any vessels that opt-out will be subject to human observer coverage, with the exception of those granted temporary exemptions for life raft capacity, if exemptions continue to apply in 2016.

All EM equipment will be provided through the EM cooperative research program. If selected, vessels will be expected to carry and maintain EM systems on all halibut IFQ trips and all groundfish trips in Alaskan federal fisheries in 2016. Vessels will also be required to use either an electronic or a paper logbook to record basic information such as fishing location, fishing effort (i.e. hook count) and fishing duration.

EM systems will be installed in a limited number of ports - likely Homer, Kodiak, Sand Point, and Sitka, AK. The final list of ports will be included in the 2016 EM Pre-Implementation Plan. Once a vessel's participation has ended, the EM system will be removed at one of these ports. Vessels will not be required to make all their landings in these ports while participating in this cooperative research project.

If you would like to opt-in to this EM cooperative research in Alaska, please contact Elizabeth Chilton at 206 526-4197 or via e-mail at elizabeth.chilton@noaa.gov by **July 27, 2015**. We look forward to working with you in this EM cooperative research effort.

Chris Rilling
Director
Fisheries Monitoring and Analysis Division
Alaska Fisheries Science Center
7600 Sand Point Way NE
Seattle, WA 98115

Appendix D. Full Coverage Compliance Agreement Letter for the BSAI Pacific Cod Fleet

----------Example Letter Requesting Full Coverage in the BSAI----------

(Include your return mailing address)

(Date your letter)

James W. Balsiger
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99801

Dear Dr. Balsiger:

We are writing to request that the National Marine Fisheries Service assign the attached list of vessels with 100% observer coverage for 2016 any time these boats are fishing in the Bearing Sea Aleutian Islands (BSAI) in 2016. This will enable trawl catcher vessels in the BSAI Pacific cod fishery to take observer coverage in addition to that required for the partial observer coverage category.

We understand that we will be required to comply with all applicable regulations, including logging all fishing trips that are not AFA pollock prior to the start of a trip. Trips will be logged in the Observer Declare and Deploy System (ODDS).

Once the trips are logged, we understand that we will procure an observer through one of the certified observer providers and pay for this observer coverage directly to the observer providers. In addition, we understand that the observer fee liability under §679.55 would continue to apply.

We agree to, and understand, the following:

1. individuals taken over and above existing observer coverage requirements are observers as defined at §679.2;
2. vessel owners and operators will comply with the prohibitions protecting observers that are at §679.7(g) and will meet the vessel responsibilities described at §679.51(e);
3. vessel owners and operators are subject to general requirements applicable to observers described at §600.746;
4. vessel owners or operators must log all fishing trips and follow applicable regulations when they are in the partial coverage category; and
5. landings will be subject to the observer fee under §679.55.

Sincerely,

Vessel Name: _____

Federal Fisheries Permit Number:_____

ADF&G Vessel Number:_____

Printed Name of the vessel owner: _____

Signature of the vessel owner: _____

Vessel Name: _____

Federal Fisheries Permit Number:_____

ADF&G Vessel Number:_____

Printed Name of the vessel owner: _____

Signature of the vessel owner: _____

Vessel Name: _____

Federal Fisheries Permit Number:_____

ADF&G Vessel Number:_____

Printed Name of the vessel owner: _____

Signature of the vessel owner: _____

Vessel Name: _____

Federal Fisheries Permit Number:_____

ADF&G Vessel Number:_____

Printed Name of the vessel owner: _____

Signature of the vessel owner: _____