Final

Regulatory Impact Review
for Proposed Regulatory Amendment

Halibut Deck Sorting Monitoring Requirements for Trawl Catcher/Processors Operating in Non-Pollock Groundfish Fisheries off Alaska

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National Oceanic and Atmospheric Administration

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Abstract: This Regulatory Impact Review evaluates the benefits and costs of a regulatory amendment to allow halibut to be sorted on the deck of trawl catcher/processors (CPs) and motherships when operating in non-pollock groundfish fisheries off Alaska. This would allow Pacific halibut to be returned to the sea from the deck prior to weighing on a flow scale. The purpose of this action is to reduce the discard mortality of halibut aboard trawl CPs and motherships operating in the non-pollock fisheries off Alaska and to ensure observer data continue to provide reliable estimates of halibut prohibited species catch. A reduction in discard mortality of halibut could contribute to maximized harvest of the directed groundfish fisheries and reduce halibut mortality which may provide additional harvest opportunities in the commercial halibut fishery. In addition to the primary action, this RIR also evaluates the benefits of minor changes to bin monitoring requirements in the Amendment 80 fleet and the observer sampling station inspection requirements in Federal groundfish fisheries.

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List of Acronyms and Abbreviations

Acronym	Description
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
AKSC	Alaska Seafood Cooperative
BSAI	Bering Sea and Aleutian Islands
BSAI FMP	Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area
CAS	Catch Accounting System
CDQ	community development quota
CDQ Program	Western Alaska Community Development Program
CFR	Code of Federal Regulations
Convention	Convention between the United States and Canada for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea
Council	North Pacific Fishery Management Council
CP	catcher/processor
CV	catcher vessel
DMR	discard mortality rate
DVR	digital video recorder
EFP	exempted fishing permit
E.O.	Executive Order
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
ESA	Endangered Species Act
FMA	Fisheries Monitoring and Analysis Division
FMP	fishery management plan
FONSI	Finding of No Significant Impact
FR	Federal Register
FRFA	Final Regulatory Flexibility Analysis
GC	General Counsel
GOA	Gulf of Alaska
IRFA	Initial Regulatory Flexibility Analysis
GOA FMP	Fishery Management Plan for Groundfish of the Gulf of Alaska
IFQ	individual fishing quota
IPHC	International Pacific Halibut Commission

Acronym	Description
LLP	license limitation program
m	meter or meters
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
mt	metric ton
NMFS	National Marine Fishery Service
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
Observer Program	North Pacific Groundfish and Halibut Observer Program
OLE	Office of Law Enforcement
PSC	prohibited species catch
QS	quota share
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
Rockfish Program	Central Gulf of Alaska Rockfish Program
SAFE	Stock Assessment and Fishery Evaluation
SBA	Small Business Act
Secretary	Secretary of Commerce
SFD	Sustainable Fisheries Division
t	ton
TAC	total allowable catch
TBD	to be determined
TLAS	Trawl limited access sector
U.S.	United States

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1 Introduction

This Regulatory Impact Review (RIR)[1] evaluates the benefits and costs of a regulatory amendment to allow halibut to be sorted on the deck of trawl catcher/processors (CPs) and motherships when operating in non-pollock groundfish fisheries off Alaska. This would allow Pacific halibut to be returned to sea from the deck prior to weighing on a flow scale. The purpose of these regulations is to reduce the discard mortality of halibut aboard trawl CPs and motherships operating in non-pollock fisheries off Alaska.

An RIR assesses the benefits and costs of the alternatives, as well as their distribution. This RIR also provides information to use in evaluating the consistency of the alternatives with the National Standards in section 301 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

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

> *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 nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.*

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

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

1.1 Purpose and Need

Halibut is a prohibited species in the groundfish fisheries of the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA). Halibut prohibited species catch (PSC) limits are necessary to limit the amount of halibut taken as bycatch in the groundfish trawl fisheries off Alaska. These limits ensure halibut is available to support the subsistence, personal use, recreational (sport), and commercial halibut fisheries. Regulations for the directed commercial halibut fisheries are implemented by the International Pacific Halibut Commission (IPHC) and allow Pacific halibut to be commercially harvested in the North

[1] The proposed action has no potential to have an effect individually or cumulatively on the human environment. As such, it is categorically excluded from the need to prepare an Environmental Assessment.

Pacific Individual Fishing Quota (IFQ) and Community Development Quota (CDQ) fisheries. Since 2009, halibut PSC limits have been reduced in the GOA and in the BSAI with the most recent reductions occurring in 2014 and 2016. These reductions increase the potential for the halibut PSC limit to constrain the harvest of allocated species in non-pollock groundfish trawl fisheries. A decrease in halibut biomass has been shown in the BSAI.[2]

In some years, harvesters may reach their halibut PSC limits before the total amount of allocated species are harvested in the non-pollock limited access fisheries in the BSAI and GOA. In these years, halibut PSC can reduce the overall economic benefit of the fishery by closing the directed fishery prior to harvesting all the allocated species. The potential for halibut PSC to limit the harvest of groundfish creates an incentive for vessels to minimize the amount of halibut that accrues toward the PSC limit.

To minimize halibut mortality, NMFS requires that all halibut must be returned to the sea as soon as possible after allowing sampling by observers. Under current catch handling and monitoring requirements NMFS-certified observers (observers) assess the condition of halibut after weighing and sorting in the factory at the point of discard. These assessments are used to calculate a discard mortality rate (DMR) which is applied to the total estimated amount of halibut caught to determine the amount of halibut PSC accruing against a sector's halibut PSC limit.

Halibut mortality increases with increased handling and time out of water. In the non-pollock groundfish trawl fisheries most of the halibut are typically out of the water for long periods of time and are usually dead or in poor condition at the time of discard after weighing and sorting in the factory. This results in a high halibut DMR for the non-pollock trawl groundfish fishery.

For several years, experiments conducted through Exempted Fishing Permits (EFPs), have tested procedures to decrease halibut mortality by sorting, sampling, and discarding halibut from the deck of the vessel, rather than discarding halibut from the factory. The data collected during EFP fishing show that the practice of deck sorting can reduce halibut mortality. Participation in these EFPs has been widespread across fisheries, times of year, and fishing fleets within the BSAI.

Existing monitoring and enforcement requirements are designed to ensure that observer data results in reliable estimates of total catch and bycatch used for fisheries management in the non-pollock groundfish trawl fisheries in the BSAI and GOA. Because total catch weight and observer species composition data are currently collected in the factory of trawl catcher/processors and motherships, no halibut may be discarded until after sorting and weighing resulting in high discard mortality. The purpose of this action is to reduce the mortality of halibut bycatch and continue to ensure that observer data results in reliable estimates of total catch bycatch species in the non-pollock groundfish trawl fisheries off Alaska.

1.2 Statutory Authority

Under the Magnuson-Stevens Act (16 U.S.C. 1801, *et seq*.), the United States has exclusive fishery management authority over all marine fishery resources found within its exclusive economic zone. The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in the regional fishery management councils. In the Alaska Region, the North Pacific Fishery Management Council (Council) has the responsibility for preparing fishery management plans (FMPs) and FMP amendments for the marine fisheries that require conservation and management, and for submitting its

[2] Described in more detail in Section 3.3.1.1 of the Environmental Assessment/ Regulatory Impact Review For 2018 Pacific halibut catch limits and associated management measures in International Pacific Halibut Commission Regulatory Areas: Area 2C (Southeast Alaska), Area 3A (Central Gulf of Alaska), Area 3B (Western Gulf of Alaska), and Area 4 (subdivided into 5 areas, 4A through 4E, in the Bering Sea and Aleutian Islands of Western Alaska). Available from the NMFS Alaska Region website at http://alaskafisheries.noaa.gov.

recommendations to the Secretary. Upon approval by the Secretary, NMFS is charged with carrying out the Federal mandates of the Department of Commerce with regard to marine and anadromous fish.

Trawl CPs operating in non-pollock groundfish fisheries off Alaska are managed under the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI FMP) and the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA FMP).[3] The proposed action would amend Federal regulations at 50 CFR 679. Actions taken to implement regulations governing these fisheries must meet the requirements of Federal law and regulations.

This action is authorized under section 305(d) of the Magnuson-Stevens Act, which authorizes the Secretary of Commerce to develop regulations necessary to implement fishery management plans (FMPs). Specifically, this action is necessary to implement monitoring requirements consistent with section 3.9.1 and the following management objectives included in Section 2.2.1 of the BSAI FMP and the GOA FMP, which state—

- "Continue and improve current incidental catch and bycatch management program" (Objective 14) and
- "Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and non-commercial species" (Objective 19).

1.3 History of this Action

Halibut bycatch has long been a concern in the directed groundfish fisheries in the BSAI and GOA off Alaska. Low halibut bycatch mortality limits can be constraining in certain fisheries with relatively high halibut bycatch. The following sections describe the background information and catch and bycatch rates for the fisheries affected by this action. Several of the fisheries affected by this action are managed under a cooperative structure where individual vessels share information to independently manage their harvest of the allocated species within transferrable bycatch limits. These cooperative programs have allowed individual vessels to more closely monitor and track their halibut bycatch. By sharing information about areas of high bycatch, vessels may implement bycatch avoidance behavior by fishing in a different area. Since 2009, industry participants have tested various catch handling and monitoring procedures in an effort to reduce the mortality of halibut discarded by using EFPs. The details of these experiments are described in Section 1.3.5.

In October 2017, after several years of testing catch handling and monitoring procedures, NMFS began preparing this RIR as the first step toward modifying regulations to allow halibut deck sorting. NMFS notified EFP participants and consulted with the North Pacific Fishery Management Council (NPFMC) at its October, 2017 meeting.[4] In June 2018, NMFS consulted with the NPFMC by posting the draft RIR on the NPFMC meeting agenda and providing an overview of during the NMFS B2 agenda item[5].

1.3.1 Background

The IPHC and NMFS manage fishing for Pacific halibut (*Hippoglossus stenolepis*) through regulations established under the authority of the Convention between the United States and Canada for the

[3] The BSAI FMP is available on the Council's website at: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf. The GOA FMP is available on the Council's website at: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

[4] See the NMFS Management report under agenda item B2 on the Council's website at: http://legistar2.granicus.com/npfmc/meetings/2017/10/965_A_North_Pacific_Council_17-10-02_Meeting_Agenda.pdf.

[5] The letter and draft RIR are available on the Council's website at: http://legistar2.granicus.com/npfmc/meetings/2018/6/982_A_North_Pacific_Council_18-06-04_Meeting_Agenda.pdf.

Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea (Convention) and the Northern Pacific Halibut Act of 1982. The IPHC promulgates regulations pursuant to the Convention. The IPHC's regulations are subject to approval by the Secretary of State with concurrence from the Secretary. Regulations implemented by the IPHC allow Pacific halibut to be commercially harvested by the directed North Pacific longline fishery.

Pacific halibut is fully utilized in the waters off Alaska as a target species in subsistence, personal use, recreational (sport), and commercial halibut fisheries. Halibut is also incidentally taken as bycatch in groundfish fisheries. Although participants in the groundfish fisheries are under an obligation to avoid halibut, all halibut cannot be avoided. The groundfish fisheries cannot be prosecuted without some amount of halibut bycatch because groundfish and halibut occur in the same areas at the same times and because no fishing gear or technique has been developed that can avoid all halibut bycatch.

Although halibut is taken as bycatch by vessels using all types of gear (trawl, hook-and-line, pot, and jig), halibut bycatch primarily occurs in the trawl and hook-and-line groundfish fisheries. Halibut bycatch occurs in both the GOA and the BSAI. The greatest portion of halibut bycatch occurs in the BSAI. NMFS manages halibut bycatch in the BSAI groundfish fisheries by 1) establishing halibut PSC limits for trawl and non-trawl fisheries; 2) apportioning those halibut PSC limits to groundfish sectors, fishery categories, and seasons; and 3) managing groundfish fisheries to prevent halibut PSC use from exceeding the established limits. The proposed rule for Amendment 111 to the BSAI FMP contains a detailed explanation of halibut bycatch management in the BSAI groundfish fisheries (80 FR 71650, 71654–71660, November 16, 2015).

Halibut is a prohibited species in the groundfish fisheries, requiring immediate return to the sea with a minimum of injury. Halibut caught incidentally by trawl CPs in the groundfish fisheries must be weighed on a NMFS-approved scale, sampled by observers, and returned to the ocean as soon as possible. The Council establishes annual maximum halibut bycatch allowances and seasonal apportionments adjusted by an estimated halibut DMR for groundfish fisheries. The DMRs are based on the best information available, including information contained in the annual Stock Assessment and Fishery Evaluation (SAFE) report, available at http://www.alaskafisheries.noaa.gov/. NMFS approves the halibut DMRs developed and recommended by the IPHC and the Council for the BSAI groundfish fisheries for use in monitoring the halibut bycatch allowances and seasonal apportionments (see Section1.3.2 for additional information on DMRs).

Directed fishing in a groundfish fishery closes when the halibut mortality apportionment for the fishery is reached, even if the target species catch is less than the seasonal or annual quota for the directed fishery. In the case of the Bering Sea flatfish fishery, seasons have been closed before fishery quotas have been reached to prevent the fishery from exceeding the halibut mortality apportionment.

A decrease in halibut biomass has been shown in the BSAI.[6] Amendment 57 to the BSAI FMP (65 FR 31105, May 16, 2000) prohibited the use of nonpelagic trawl gear in the non-CDQ pollock fishery in the BSAI. The prohibition was expected to permanently reduce trawl halibut PSC. Amendment 57 reduced the BSAI trawl gear halibut PSC limit of 3,775 mt by 100 mt to 3,675 mt.

With the implementation of Amendment 80 to the BSAI FMP (72 FR 52668, September 14, 2007), halibut PSC limits were established for the Amendment 80 sector and for Amendment 80 cooperatives. Amendment 80 is a catch share program that allocates several BSAI non-pollock trawl groundfish fisheries (including the flatfish fishery) among fishing sectors, and facilitates the formation of harvesting

[6] Described in more detail in Section 3.3.1.1 of the Environmental Assessment/ Regulatory Impact Review For 2018 Pacific Halibut Catch Limits and Associated Management Measures in International Pacific Halibut Commission Regulatory Areas: Area 2C (Southeast Alaska), Area 3A (Central Gulf of Alaska), Area 3B (Western Gulf of Alaska), and Area 4 (subdivided into 5 areas, 4A through 4E, in the Bering Sea and Aleutian Islands of Western Alaska). Available from the NMFS Alaska Region website at http://alaskafisheries.noaa.gov.

cooperatives in the non-American Fisheries Act (non-AFA) trawl CP sector. Amendment 80 reduced the halibut PSC allocated to the Amendment 80 sector starting in 2009. The allocation of halibut PSC to the Amendment 80 sector was reduced 50 mt a year from 2009 to 2012 ultimately resulting in an annual reduction of 200 mt of halibut PSC for the Amendment 80 sector. In 2011, the 50 mt reduction was allocated to the CDQ sector. The halibut PSC allocation under Amendment 80 resulted in a total reduction of the annual trawl halibut PSC limit by 150 mt. Though halibut PSC limits provide Amendment 80 cooperatives more flexibility to use available mortality, halibut mortality continues to constrain fishing in some Amendment 80 fisheries. Therefore, this sector is actively exploring ways to continue to reduce halibut mortality.

The Amendment 80 sector may also harvest groundfish in the GOA. The Amendment 80 sector does not receive fishery allocations in the GOA and the amount of each groundfish species that may be caught by the cooperative in the GOA is limited to the sideboard amounts specified in Table 27 of the 2018 GOA Groundfish Harvest Specifications.[7] The Amendment 80 sector is subject to halibut PSC limits established for that sector in the GOA. The Amendment 80 sector GOA halibut PSC limits for 2018 are provided in Table 28 of the GOA Groundfish Harvest Specifications.

Amendment 111 to the BSAI FMP, implemented on April 27, 2016 (81 FR 24714), reduced halibut PSC limits in the BSAI groundfish fisheries in four groundfish sectors: the Amendment 80 sector; the BSAI trawl limited access sector (all non-Amendment 80 trawl fishery participants); the non-trawl sector (primarily hook-and-line CPs); and the Western Alaska Community Development Program (CDQ Program). The purpose of Amendment 111 was to decrease BSAI halibut PSC to the extent practicable by the BSAI groundfish fisheries while continually achieving optimum yield from the BSAI groundfish fisheries. The final rule for Amendment 111 implemented the following reduced BSAI halibut PSC limits: 1,745 mt for the Amendment 80 sector, 745 mt for the BSAI trawl limited access sector, 710 mt for the BSAI non-trawl sector, and 315 mt for the CDQ Program. These reductions resulted in an overall BSAI halibut PSC limit of 3,515 mt. By reducing halibut PSC, the final rule for Amendment 111 aimed to increase harvest opportunities for the directed halibut fisheries, if the IPHC increased catch limits for the directed halibut fisheries.

GOA halibut PSC limits were reduced 7 percent with the implementation of Amendment 95 to the GOA FMP (79 FR 9625, February 20, 2014). The reduction of PSC limits also may create additional harvest opportunities in the directed fisheries at a time of declining halibut biomass. This amendment reduced GOA halibut PSC limits by 7 percent for the hook-and-line CP sector, 15 percent for the hook-and-line catcher vessel (CV) sector, and 15 percent for the trawl sector.

Amendments 111 to the BSAI FMP and 95 to the GOA FMP further incentivized the continued exploration of ways to reduce halibut mortality.

1.3.2 Catch Rates, Bycatch Rates, Total Annual Harvest for Target and Incidental Catch Species, Discards, and Halibut Mortality

To monitor halibut PSC limits and apportionments, the Regional Administrator uses observed halibut incidental catch rates, halibut DMRs, and estimates of groundfish catch to project when a fishery's halibut PSC limit or seasonal apportionment is reached. Halibut incidental catch rates are based on observers' estimates of halibut incidental catch in the groundfish fisheries. DMRs are estimates of the proportion of incidentally caught halibut that do not survive after being returned to the sea. The cumulative halibut mortality that accrues to a particular halibut PSC limit is the product of a DMR multiplied by the estimated halibut PSC. DMRs are estimated using the best information available in conjunction with the

[7] The 2018 GOA Groundfish Harvest Specifications are available at https://alaskafisheries.noaa.gov/harvest-specifications/field_harvest_spec_year/2017-2018-841.

annual BSAI SAFE report process. The DMR estimation method and findings are available on the Council website (https://www.npfmc.org/halibut-management-committee/).

Historically, DMRs consisted of long-term averages of annual DMRs within target fisheries that were defined by management area, CDQ, gear, and target species. Since the late 1990s, halibut DMRs were calculated by the IPHC as part of the SAFE reports, which then provided the estimates to the Council and NMFS for application in managing halibut PSC limits. Long-term averages were taken from annual estimates for the most recent 10-year period with the number of years with data to support annual DMR estimates varying among fisheries. Fishery-specific DMRs, once calculated, were generally in place for 3-year increments. See Table 1 for halibut DMRs for the BSAI for 2013 through 2016.

Table 1 IPHC-calculated Pacific halibut DMRs for the BSAI for 2013 through 2016.[8]

Gear	Fishery	2013, 2014, and 2015 Halibut DMR (percent)	2016 Halibut DMR (percent)
Non-CDQ hook-and-line	Greenland turbot	13	11
	Other species[1]	9	9
	Pacific cod	9	9
	Rockfish	4	9
Non-CDQ trawl	Alaska plaice	71	66
	Arrowtooth flounder[2]	76	84
	Atka mackerel	77	82
	Flathead sole	73	72
	Greenland turbot	64	82
	Kamchatka flounder	n/a	84
	Non-pelagic pollock	77	81
	Pelagic pollock	88	88
	Other flatfish[3]	71	63
	Other species[1]	71	66
	Pacific cod	71	66
	Rockfish	79	83
	Rock sole	85	86
	Sablefish	75	66
	Yellowfin sole	83	84
Non-CDQ Pot	Other species[1]	8	9
	Pacific cod	8	9
CDQ trawl	Atka mackerel	86	82
	Arrowtooth flounder	n/a	84
	Flathead sole	79	79
	Greenland turbot	89	84
	Kamchatka flounder	n/a	86
	Non-pelagic pollock	83	90
	Pacific cod	90	87
	Pelagic pollock	90	89
	Rock sole	88	70

[8] Source: Harvest Specification tables: https://alaskafisheries.noaa.gov/sites/default/files/16_17bsaitable19.pdf, https://alaskafisheries.noaa.gov/sites/default/files/15_16bsaitable19.pdf, https://alaskafisheries.noaa.gov/sites/default/files/14_15bsaitable15.pdf, https://alaskafisheries.noaa.gov/sites/default/files/13_14bsaitable15.pdf

Gear	Fishery	2013, 2014, and 2015 Halibut DMR (percent)	2016 Halibut DMR (percent)
	Rockfish	80	86
	Yellowfin sole	86	85
CDQ hook-and-line	Greenland turbot	4	10
	Pacific cod	10	10
CDQ pot	Pacific cod	8	1
	Sablefish	34	41

[1] "Other species" includes skates, sculpins, sharks, squids, and octopuses.

[2] In 2013, 2014, and 2015, Arrowtooth flounder includes Kamchatka flounder.

[3] "Other flatfish" includes all flatfish species except for halibut (a prohibited species), Alaska plaice, flathead sole, Greenland turbot, rock sole, yellowfin sole, Kamchatka flounder, and arrowtooth flounder.

NMFS revised methods for estimating DMRs consistent with those methods developed by the halibut DMR working group and recommended by the Council for the 2017 and 2018 groundfish harvest specifications in both the BSAI and GOA.[9] Table 2 and Table 3 compare the 2016 halibut DMRs to the 2017 and 2018 halibut DMRs recommended by the working group for the BSAI and GOA, respectively. A summary of the changes in DMR estimation methods made by the DMR working group follows.

The halibut DMR working group, consisting of the IPHC, Council, and NMFS Alaska Region staff recommended the following broad changes to the DMR estimation method: implementation of sampling design consistent with sampling protocols used under the North Pacific Observer Program (Observer Program); categorization of data of halibut viability based on vessel operations (sorting and handling practices, gear type, and processing sector) rather than target fisheries; and revision of reference timeframes to obtain estimates that are more responsive to changes in how the groundfish fisheries are observed and managed. These recommendations, and others, are described below.

- Incorporate CDQ with non-CDQ in the calculation of the DMRs instead of the currently specified DMRs, which calculate DMRs separately for CDQ and non-CDQ. Regulations allow assignment of CDQ status to a haul up to 2 hours after completion of gear retrieval. Most vessels fishing under the CDQ Program also participate in the non-CDQ fisheries. The size of the haul, fishing operations, and catch-handling process do not tend to differ compared to the non-CDQ fisheries. For this reason, CDQ is not a recommended aggregation factor for estimating DMRs under the revised estimation method.
- Revise the DMR estimation method for consistency with the sampling protocols instituted in 2013 through the restructured Observer Program. The Observer Program randomizes sampling of fishing trips within operational groupings, sampling of hauls within fishing trips, and sampling of biological data within hauls. Basing halibut DMR estimation on a sampling design consistent with Observer Program sampling protocols should reduce the potential for sampling bias, improve data on operational causes of variation in post-capture halibut viability, and promote the ability for NMFS to make timely improvements to halibut DMR estimation in the future.
- Incorporate the use of vessel operations into the DMR estimation methodology. This incorporates data about the viability (likelihood to survive) of discarded halibut into DMR calculations. Data based on different vessel operational categories, such as sorting practices, handling practices, gear type, and processing sectors (i.e., CVs, CPs, and CVs delivering to motherships), provide better information on halibut viability. NMFS expects that incorporating this information into the DMR estimation method will yield a more precise estimate of actual mortality.

[9] Halibut DMR Working Group Report, October 2016. Available at http://npfmc.legistar.com/gateway.aspx?M=F&ID=fe3c4031-8377-45c7-b081-39fe23315cfe.pdf

- Remove the use of target fishery. Fishery targets do not necessarily characterize statistical and/or vessel operational differences in the sampling or handling of halibut PSC. Using fishery target aggregations may have reduced the quality of DMR estimates due to small sample sizes or by combining vessel operations with very important differences in sampling and handling characteristics.
- Change the reference timeframe for DMR calculations. Rather than using 10-year average rates, the revised method estimates DMRs based on initial 3-year average rates. Using 2013 as the starting year is more responsive to, and better aligns, DMR calculation method with, the 2013 restructured Observer Program's sampling protocols. Using 2013 as the base year, NMFS and the Council will evaluate the timeframe each year. This will enable NMFS and the Council to update the method and the halibut DMRs based on the best available information.

The working group's discussion paper also included a comparison of the total amount of halibut mortality that accrues using current DMRs versus the working group's recommended DMRs. Calculating the 2015 halibut mortality using specified DMRs yielded 2,312 mt of halibut mortality, whereas using the recommended DMRs yielded 2,299 mt of halibut morality (a less than 1 percent decrease). Calculating the 2016 halibut mortality (through September 2016) yielded 1,701 mt of halibut mortality, versus 1,663 mt of halibut mortality when applying the recommended DMRs (a 2 percent decrease).

Table 2 Pacific halibut DMRs for the BSAI.

Gear	Sector	Halibut DMR (percent)		
		2016	2017	2018
Pelagic trawl	All	63–90 depending on target and CDQ	100	100
Non-pelagic trawl	Mothership and CP		85	84
Non-pelagic trawl	CV		52	60
Hook-and-line	CP	9–11 depending on target and CDQ	8	8
Hook-and-line	CV		14	17
Pot	All	1–41 depending on target	6	9

Table 3 Pacific halibut DMRs for the GOA.

Gear	Sector	Halibut DMR (percent)		
		2016	2017	2018
Pelagic trawl	All	58–76 depending on target	100	100
Non-pelagic trawl	Mothership and CP		85	84
Non-pelagic trawl	CV Rockfish Program		67	62
Non-pelagic trawl	CV		65	67
Hook-and-line	CP	10	11	10
Hook-and-line	CV	10	12	17
Pot	All	15	10	7

1.3.3 Halibut PSC Accounting Including Recent Reductions

NMFS calculates halibut PSC mortality based on groundfish observer data. Observers sample hauls and then estimates of the ratio of halibut to groundfish are applied to the official total catch of groundfish for each sampled haul. Observers have sampled catch in the Alaska Federal groundfish fisheries since the early 1990s and routinely collect lengths and weights of the sampled catch. The observer data are provided to the NMFS Alaska Region Catch Accounting System (CAS). Rates for the amount of halibut

caught are developed from the sampled hauls. Factors to determine which rates apply to which hauls include vessel type, whether sampled hauls occurred on the same vessel, processing sector, nearness in time, trip target, gear type, FMP area, reporting area, special areas, management program, and observer selection method. These factors are applied to algorithms to give a rate of halibut caught to every haul. This rate is then applied to the official total catch of each haul. Once the estimated halibut catch for every haul is calculated, estimated DMRs are applied to estimate the amount of halibut PSC mortality accrued by every haul.

A decrease in halibut biomass has been shown in the BSAI.[10] Amendment 80 reduced the halibut PSC allocated to the Amendment 80 sector starting in 2009. The allocation of halibut PSC to the Amendment 80 sector was reduced 50 mt a year from 2009 to 2012 ultimately resulting in an annual reduction of 200 mt of halibut PSC from the Amendment 80 sector. In 2011, the 50 mt reduction was allocated to the CDQ sector. The halibut PSC allocation under Amendment 80 resulted in a total reduction of the annual trawl halibut PSC limit by 150 mt. BSAI halibut PSC limits were reduced 21 percent with the implementation of Amendment 111 to the BSAI FMP (81 FR 24714, April 27, 2016; Table 4). This reduction may provide additional directed fishing opportunity in a climate of reduced halibut biomass.

Table 4 Changes in BSAI halibut PSC limits (mt) from 2015 to 2016 as a result of Amendment 111.

	Amendment 80	BSAI TLAS	Hook-and-line fisheries	CDQ	Total PSC limit
2015	2,325	875	833	393	4,426
2016	1,745	745	710	315	3,515

GOA halibut PSC limits were reduced 7 percent with the implementation of GOA FMP Amendment 95 (79 FR 9625, March 24, 2014). The reduction of PSC limits also may create additional harvest opportunities in the directed fisheries at a time of declining halibut biomass. This amendment reduced GOA halibut PSC limits by 7 percent for the hook-and-line CP sector, 15 percent for the hook-and-line CV sector, and 15 percent for the trawl sector.

1.3.4 Halibut Discard Requirements

Before incidentally caught halibut are returned to the sea, at-sea observers must estimate halibut and groundfish catch amounts. Regulations in 50 CFR part 679 assure that observer estimates of halibut and groundfish catch are credible and accurate, and that potential bias is minimized. For example, NMFS requires Amendment 80 sector fishing vessels to make all catch available for sampling by an observer; prohibits vessel crew from tampering with observer samples; prohibits vessel crew from removing halibut from a codend, bin, or conveyance system prior to being observed and counted by an at-sea observer; and prohibits fish (including halibut) from remaining on deck unless an observer is present.

Section 679.2 and Table 2b to part 679 define halibut caught incidentally to directed fishing for groundfish as PSC. Halibut PSC in the directed groundfish fisheries of the GOA and BSAI are managed under § 679.21. These regulations require that all vessels minimize catch of prohibited species and that all vessels discard PSC with a minimum of injury after allowing for sampling by an observer. The requirement to discard halibut caught with trawl gear was first implemented in 1977 as a requirement for the foreign fishing fleet (42 FR 9297, February 15, 1977). Subsequent actions implemented requirements applicable to the foreign fishing (43 FR 59292, December 19, 1978) and domestic trawl fisheries of the

[10] Described in more detail in Section 3.3.1.1 of the Environmental Assessment/ Regulatory Impact Review for 2018 Pacific Halibut Catch Limits And Associated Management Measures in International Pacific Halibut Commission Regulatory Areas: Area 2C (Southeast Alaska), Area 3A (Central Gulf of Alaska), Area 3B (Western Gulf of Alaska), and Area 4 (subdivided into 5 areas, 4A through 4E, in the Bering Sea and Aleutian Islands of Western Alaska). Available from the NMFS Alaska Region website at http://alaskafisheries.noaa.gov.

GOA (43 FR 52709, November 14, 1978) and BSAI (46 FR 63295, December 31, 1981) that required vessels to sort catch and minimize harm to PSC. These requirements were intended to minimize the incidental catch of halibut in the trawl fisheries, as well as minimize the mortality of discarded halibut.

Halibut discard requirements state that an observer must first have access to sample the catch prior to sorting and discard. The specific point of discard and catch handling procedures may vary depending on each vessel's configuration, but generally, since the implementation of monitoring requirements for the Amendment 80 Program and the Central GOA Rockfish Program (Rockfish Program), vessels are allowed only one operational line for the mechanized movement of fish from the scale used to weigh catch and the location where the observer collects species composition samples.

The Observer Sampling Manual,[11] published annually by the Observer Program, details sampling techniques and protocols for the most common vessel configurations.

1.3.5 Deck Sorting EFP

In the mid-1990s, cooperative research was proposed to return halibut to the water while viable. In 1999, Groundfish Forum developed the "halibut mortality avoidance program" proposal to allow deck sorting on its trawl CPs fishing for flatfish. Unfortunately, neither proposed program could be implemented because the needed monitoring and accountability measures were unavailable at the time. The catch handling procedures for trawl CPs currently require all catch to go over the flow scale to allow for complete accounting of weight and catch composition by the observer in the factory. Regulations do not allow the crew to sort out the halibut on deck and return them to the sea. Absent changes in regulations, deck sorting can only be done under EFPs. The BSAI and GOA FMPs and the implementing regulations at §§ 600.745(b) and 679.6 allow the NMFS Regional Administrator to authorize, for limited experimental purposes, fishing that would otherwise be prohibited. To explore the feasibility of modifications to catch handling procedures to sort and account for halibut on deck, EFPs have been granted by NMFS over about a 10-year period. These EFPs, as well as the EFP applications, are available on the NMFS Alaska Region website (https://alaskafisheries.noaa.gov/) and are incorporated here by reference. Summaries of the EFPs are provided in Table 5 and this section.

[11] The Observer Sampling Manual is available on the NOAA Fisheries Website: https://www.afsc.noaa.gov/FMA/document.htm.

Table 5 Summary of deck sorting EFP history, 2009 through 2019.

Year	Management Area	Participating Sectors	Number of Vessels	EFP Fishing Months	Sampling	Halibut Discard Estimate Method	EFP Halibut Mortality Rate (percent)[12]	Halibut Mortality Savings (t)[13]
2009	BSAI	A80 CPs	3	May, June	2 sea samplers (+ 2 observers)	Deck and factory census, length and viability for every halibut	48	17.15
2012	BSAI	A80 CPs	4	May – September	2 sea samplers (+ 2 observers)	Deck: systematic random sample of 1 in 5 halibut, length and viability; census on 20 percent of EFP hauls; Factory: observer species composition sample	62	10.77
2015	BSAI	A80 CPs	9	May – November	2 sea samplers (+ 2 observers)	Same as 2012, except crew census of halibut in the factory	49	151.6
2016	BSAI	A 80/CDQ CPs[14]	12	May – December	3 observers	Same as 2015	45	290
2017	BSAI	A 80/TLAS/CDQ CPs	17	January – December	2 – 4 observers; vessel choice	Deck: same as 2015; Factory: observer species composition sample and census by crew	55	599
2018/2019	BSAI, GOA	A80/TLAS/CDQ CPs	21[15]	January – TBD	2 – 4 observers; vessel choice	In 2018 (may change in 2019) Deck: Collect lengths on first 15 fish then length and viability of 1 in 5 systematic random sample; Factory: observer species composition sample	TBD	TBD

[12] For this table, the EFP Halibut Mortality Rate includes factory and deck sorted halibut. In section 4.1.4 of this report, the combination of both sources of mortality is referred to as the "effective" mortality rate. Source: Final reports prepared by the EFP Principal Investigator. Reports available online at: https://alaskafisheries.noaa.gov/fisheries/efp.

[13] Source: Final reports prepared by the EFP Principal Investigator. Reports available online at: https://alaskafisheries.noaa.gov/fisheries/efp

[14] Note: The TLAS sector was included in the EFP; however, no deck sorting was conducted during TLAS fisheries.

[15] This table includes participants as of August 2018.

Table 6 lists the CPs and mothership vessels that have participated in the deck sorting EFP since 2015.

Table 6 List of CPs and Mothership vessels that have participated in the deck sorting EFP since 2015.

		EFP Participant			
Vessel Name	Vessel ID	**2015**	**2016**	**2017**	**2018†**
ALASKA SPIRIT	3819			Yes	Yes
ALASKA VICTORY	4093				Yes
ALASKA WARRIOR	3423				Yes
AMERICAN NO I	1879			Yes	Yes
ARAHO	34017				Yes
ARICA	3694	Yes	Yes	Yes	Yes
CAPE HORN	2110	Yes	Yes	Yes	Yes
CONSTELLATION	4092	Yes	Yes	Yes	Yes
DEFENDER	4635	Yes	Yes	Yes	Yes
ENTERPRISE	5822	Yes		Yes	Yes
KATIE ANN*	1996		Yes	Yes	Yes
LEGACY	3367	Yes	Yes	Yes	Yes
NORTHERN GLACIER*	661		Yes	Yes	Yes
OCEAN PEACE	2134	Yes			Yes
REBECCA IRENE	1610	Yes	Yes	Yes	Yes
SEAFISHER	3835		Yes	Yes	Yes
SEAFREEZE ALASKA	2733		Yes	Yes	Yes
SEAFREEZE AMERICA	34249		Yes	Yes	Yes
UNIMAK	3369	Yes	Yes	Yes	Yes
US INTREPID	2800			Yes	Yes
VAERDAL	2123			Yes	Yes
Total Number of Vessels		9	12	17	21

†This table includes participants as of August 2018.

2009 EFP

In March 2009, an Amendment 80 cooperative (Best Use Cooperative) submitted an application to the NMFS Alaska Region for an EFP to explore ways to reduce halibut mortality rates on trawl CPs targeting flatfish and Pacific cod in the Bering Sea. The EFP was approved by NMFS in late April 2009. The field work was performed in May through June of 2009.

The main objective of the 2009 EFP was to evaluate the potential for reducing halibut DMRs by modifying the halibut handling procedures currently on Amendment 80 vessels. For the EFP, catch handling procedures were modified so that halibut were sorted out of the codend on deck and returned to the sea from the deck via a chute constructed for this purpose. Procedures for the EFP required full accounting of the number and length of each halibut via a census of halibut collected on deck and in the factory, as well as an assessment of viability for each halibut collected in the two locations. The EFP vessels carried two sea samplers in addition to each vessel's two regular observers to complete these duties. Sea samplers had to be observers, but were employed by the EFP holders and trained by the EFP principal investigator to perform additional EFP-related tasks that were outside of the normal duties of observers. Observers completed their normal duties as defined in the Observer Sampling Manual.

In addition to investigating reducing halibut mortality, the EFP collected data on the fraction of the halibut catch that could be sorted out on deck, the time needed to complete sorting, and halibut viability assessment under the procedures of the EFP. The EFP also examined how much extra effort deck sorting

would take and how alternative accounting methods for halibut catches and mortality rates might work on Amendment 80 vessels.

The EFP demonstrated that halibut mortality rates on Amendment 80 vessels could be reduced by sorting halibut out of the catch on deck. Most of the modified halibut handling procedures appeared to be feasible for the participating vessels. The EFP operations occurred in relatively low-volume target fisheries and in fisheries with a relatively large difference in halibut size relative to target fish. The EFP also occurred at times of the year with relatively good weather.

Any halibut mortality savings realized by the entire fleet during the EFP was to be used to allow participating EFP vessels the ability to use that savings while fishing later in the year. However, this additional halibut PSC was not needed by the fleet to allow them to completely harvest the target species later in the year.

The EFP found that collecting lengths and viabilities on every halibut on deck may have impacted mortality rates. While crew were generally able to sort out most of the halibut in as little as ten minutes, the measurement and viability assessment for each fish took considerably longer. This was because only one sea sampler was available to account for halibut lengths and viability and therefore halibut sometimes sat in a holding trough awaiting measurement and viability assessment. The EFP did not include collection of time out of water data for each halibut to avoid further delaying return of halibut to the water.

The EFP also evaluated the feasibility and efficacy of using a video monitoring system to monitor adherence to the deck sorting and halibut handling/discard protocols during the EFP. A thorough review of the imagery showed that halibut could be reliably identified and counted in the discard chute. Crew handling procedures for halibut could also be easily assessed using the video monitoring systems.

2012 EFP

In October 2011, an Amendment 80 cooperative, Alaska Seafood Cooperative (AKSC), submitted an application to the NMFS Alaska Region for an EFP to continue research on ways to reduce halibut mortality rates on Amendment 80 vessels through modifications to fishing practices and catch handling procedures.

The 2012 EFP expanded on the 2009 EFP to conduct testing on a wider subset of Amendment 80 fisheries, vessel sizes, and weather conditions over a longer time span to gain further insight into the feasibility of incorporating sorting halibut from the catch on deck and returning them to the sea as soon as practicable.

Many of the sampling procedures for this EFP were the same as the 2009 EFP. All the EFP vessels used their own groundfish and halibut PSC allocations for the fishing done during the EFP. The EFP vessels again carried two sea samplers in addition to each vessel's two observers. Sea samplers once again had to be observers.

There were three key differences to the 2012 EFP.

First, the sample design was changed to use a sample design to randomly select approximately 20 percent of the sorted halibut for length and viability assessment. One of the key variables affecting halibut viabilities is the time the fish spend out of water. Time out of water was the time between the codend reaching the stern ramp and the halibut length collection. Collecting halibut data from every halibut was time consuming in the 2009 EFP, and on some hauls backlogs of halibut awaiting length and viability assessments affected the mortality. Using this sampling method for viability assessments enabled the return of halibut to the water at nearly three times the pace compared to the 2009 EFP. To evaluate the precision and accuracy of the sample-derived halibut weight estimates, all halibut were collected post

sampling for a portion of the EFP hauls to compare census versus sample-derived weight estimates of deck-sorted halibut.

Second, time stamps were recorded for all sampled halibut to evaluate the effects of time out of water on halibut condition. Because sea samplers sampled every fifth halibut instead of completing a census this allowed them to collect each halibut's time out of water without adversely impacting halibut viability.

Finally, EM was not used during this EFP because the efficacy of the system had been proved during the 2009 EFP and additional funds to further test EM were not available.

The EFP again showed that sorting halibut on deck could reduce halibut mortality rates and gained information about the viability of halibut based on time out of water.

Any halibut mortality savings realized by the entire fleet during the EFP was to be used to allow participating EFP vessels the ability to use that savings while fishing later in the year. However, this additional halibut PSC was not needed by the fleet to allow them to completely harvest the target species later in the year.

Participants attempted to sort all of the halibut on deck no matter the time it took to complete sorting. Because of this practice, it was learned that the fraction of fish in excellent condition decreased after 20 to 25 minutes. Halibut viability dropped substantially after 25 minutes out of the water.

There were also several challenges encountered.

Vessels were not allowed to switch back and forth between EFP and normal fishing once EFP fishing began. Vessels were expected to follow deck sorting procedures on all hauls during a trip. Vessel operators chose to participate in the EFP during fisheries with smaller haul sizes and where larger, easier to sort halibut are encountered. The major issue for EFP participants was that deck sorting in high volume fisheries with low halibut bycatch or smaller halibut that were difficult to detect would offer less benefit given the time and effort necessary for minimal halibut mortality reductions. Also, harsh weather during certain fisheries could restrict the ability to deck sort. Some vessel operators chose not to participate in the EFP at times of the year when the weather may not permit extended crew and sea sampler time on deck. This limited the ability to test the efficacy of sorting halibut on deck across a broader range of vessels and fisheries.

Having only one sea sampler available reduced factory production. The EFP did not allow vessels to run fish out of the live tanks unless a sea sampler was present. When fish were brought on board, sorting in the factory was halted so that the sea samplers could sample on deck. Following the completion of halibut sorting on deck, the sea sampler moved to the factory to account for and assess viabilities for all halibut missed during deck sorting. Once the sea sampler was present at the sorting belt in the factory, the processing crew could begin running fish out of the live tank. While the cessation of sorting in the factory did not completely halt production, vessels did alter their fishing and processing strategies to minimize slowdowns in production.

2015 EFP

In January 2015, AKSC members submitted an application to the NMFS Alaska Region for another EFP to continue research on ways to reduce halibut bycatch mortality rates on Amendment 80 vessels through modifications to fishing practices and catch handling procedures. The EFP was issued in March 2015.

The principle objective of the 2015 EFP was to the test the feasibility of deck sorting for higher volume fisheries.

Based on what was learned during the 2012 EFP, deck sorting was limited to sorting for 20 to 25 minutes instead of sorting every fish as in the previous EFP. Another element of the EFP was the ability for vessels to "toggle" out of the EFP for some hauls when weather conditions or other factors impeded deck sorting efforts. Finally, the 2015 EFP was designed to help define the management and monitoring

measures that would form a regulated program in the future. This included definitions of catch handling and sampling procedures based on earlier EFPs, with the intent that those procedures would serve as an early strawman to start the regulatory process to implement deck sorting. As part of looking at eventual implementation, a requirement was added for cameras on deck to begin evaluating the monitoring of deck sorting.

Besides the changes mentioned above, the procedures on deck and in the factory were nearly identical to the 2012 EFP. Vessel owners did make significant changes to the work stations on deck so that sea samplers were able to collect samples without prolonged kneeling. In addition, for any hauls where a vessel operator did not deck sort on an EFP trip, observers collected halibut data through the standard observer sampling protocol and sea samplers were not involved in data collection. For EFP hauls, sea samplers measured all halibut found in the factory. A default DMR of 90 percent was assigned to all halibut found in the factory, based on the results from the 2009 and 2012 EFPs' halibut mortality rates. Finally, for vessels to make use of the ability to "toggle" out of deck sorting, a 1-hour notice to sea samplers was required prior to bringing an EFP haul on board. The EFP also included a 7-day advance notice for participation in the EFP and a 72-hour notice to NMFS to allow scheduling of a briefing for observers on EFP trips. Finally, the 2015 EFP provided vessel specific halibut mortality rates based on the viability assessments found on deck for that haul plus the halibut found in the factory.

This new combination of procedures worked to create more halibut mortality savings than previous EFPs and demonstrated again that deck sorting has large potential for generating savings in halibut mortality. Additionally, deck sorting was generally feasible for participants in a wider variety of flatfish target fisheries, including yellowfin sole. The EFP again found that the most critical determinant of halibut viability is time out of water. The data suggested that viability declines if the fish is not returned to the water within 20 to 25 minutes of when the net is brought on board.

For higher volume fisheries, the biggest obstacle for vessels participation in the EFP was that catch could not go over the flow scale until deck sorting was completed and the sea sampler was in the factory.

EFP 2016 (with extension into 2017)

On May 6, 2016, NMFS issued an EFP to the AKSC to continue halibut deck sorting. There were several modifications to the 2016 EFP to help determine if implementation of deck sorting would be feasible in a regulated program. Many procedures for conducting deck sorting did not change from the 2015 EFP. The new changes to the 2016 EFP included the following:

1) The EFP expanded to all Amendment 80 vessels, CPs in the trawl limited access sector (TLAS) fisheries, and motherships taking deliveries from TLAS CVs. CDQ hauls by Amendment 80 vessels were included in this EFP. The purpose was to simplify procedures aboard vessels that may participate in any of these fisheries during a single trip. It made complying with the requirements of the EFP clearer for the vessels and easier for catch accounting and collecting the data elements aboard the vessel.
2) Given that the 2016 EFP was issued mid-year, the EFP applicants were interested in gathering more data from the beginning of the year to determine if halibut deck sorting would be feasible earlier in the year, during more severe weather conditions. Therefore, the EFP permit was valid until April 2017.
3) Instead of sea samplers, three observers completed the halibut viabilities on deck and monitored halibut accounting in the factory. The use of observers reduced complexity by establishing a single set of observer duties and work areas, instead of dividing duties between sea samplers and observers. In addition, all data were entered directly into the Observer Program database. However, this also added to observer's workload which was offset by carrying a third observer in addition to the two required by regulation. Observers worked 12-hour shifts. Observers used the same random sampling methods as the 2015 EFP for halibut counts and viability on deck.

Appendix B was added to the EFP to detail the observer duties for deck sorting.

4) Accounting for halibut found in the factory also changed. Halibut found in observer species composition samples were used to derive the halibut PSC estimate for the haul. Crew also collected all the halibut in the factory and observers counted and collectively weighed the halibut. This allowed for a comparison of extrapolated amount of halibut from observer sampling to the amount of halibut collected by crew in the factory. A mortality rate of 90 percent was assigned to halibut found in the observer's composition sample in the factory. The sum of the mortality of deck sorted halibut for a haul and mortality of factory halibut for the same haul composed the total halibut mortality for the haul.

5) The long hours and tedium involved with overseeing the crew's collection of halibut in the factory was problematic for sea samplers in the 2015 EFP. Additionally, no fish could be run over the flow scale until a sea sampler was available in the factory to monitor sorting. In this 2016 EFP, observers were not responsible for overseeing the crew's collection of halibut in the factory. Fish could run over the flow scale without the observer present in the factory as long as the observer was not on deck to collect data during deck sorting (i.e., the flow scale could not run when deck sorting was occurring).

6) To facilitate monitoring of the sorting out of halibut in the factory, video monitoring systems were installed in the sorting area to record crew activities associated with the collection of factory halibut and its placement into a designated bin/tote. The camera systems for monitoring crew sorting on deck were still required for the 2016 EFP.

7) For any haul where deck sorting did not occur due to weather, all halibut mortality accounting used the observer's sample from the factory. Additionally, the crew sorted out, counted, and weighed all halibut found in the factory for that haul following the procedures described above. The 90 percent mortality rate was applied to the observer sample extrapolation for non-deck sorted hauls during an EFP trip.

8) The requirement for limiting deck sorting to 20 to 25 minutes was removed. Since vessels were no longer required to attempt to sort every halibut on deck and were instructed to only sort until the viability of halibut decreased, a time limit on deck sorting was not warranted.

9) In order to facilitate training of observers deployed on vessels in the EFP, as well as to ensure the observers had the additional equipment needed to conduct sampling during halibut deck sorting, two notifications were required. First, the EFP required the observer provider to be notified that the vessel would be entering the EFP so that they could deploy the additional observer for those trips. In addition, the EFP required the Observer Program be notified so that the observers could be briefed on the additional duties required for halibut deck sorting. Additionally, vessel personnel were required to conduct a meeting with the observers prior to the first EFP trip with a new observer to discuss their vessel specific fishing protocols and responsibilities.

Again, the 2016 EFP demonstrated that significant halibut mortality savings could be realized through sorting halibut on deck. It also showed that observers could follow the sampling protocols laid out in Appendix B to the 2016 EFP.[16] The initial results also showed that there was no significant difference between the observer estimate of halibut mortality in the factory and the census conducted by the crew. However, the AKSC still remained concerned about the observer sampling to determine the amount of factory halibut on hauls where deck sorting has made halibut a rarer species and was interested in gathering more data.

[16] Available on the NMFS Alaska Region website at https://alaskafisheries.noaa.gov/sites/default/files/efp2016-01-050616permit.pdf.

Some challenges did occur. First, the logistics of deploying the additional observer and ensuring the observers had the proper briefing were sometimes difficult and at least one vessel could not participate in the EFP for a trip because an observer was not available or a briefing could not be conducted. Also, confusion sometimes occurred between the vessel crew and the observer, which resulted in some deck sorted hauls not being observed. There were also some occurrences where fish were run over the flow scale in the factory when the observer was on deck. Finally, with the removal of the 20 to 25 minute on deck sorting, some vessels deck sorted for extended periods of time (up to 2 hours). This resulted in little halibut mortality savings and increased safety issues for both the observers and crew.

In addition, testing of a chute camera system occurred aboard two vessels. The testing of this system was to determine if the cameras could automate measurement of halibut so the need for observers on deck could be reduced. The testing was limited because of design challenges and the need to modify areas on deck to accommodate the chute camera system. The system showed promised and continued testing and refinement were warranted.

The permit holders, as well as NMFS Alaska Region, realized several permit modifications would help streamline and provide better compliance with the 2016 EFP. These modifications to the permit were approved by NMFS Alaska Region on January 10, 2017.

Many vessels found that the factory operations did not require a second observer on duty. The permit was modified to allow the vessels to choose the number of observers they carried on EFP trips. Each vessel had to have at least two observers, but could have up to four observers aboard during EFP trips. If two observers were aboard, no fish could be run over the flow scale when the observer was on deck for halibut deck sorting. If three observers were aboard, the captain could coordinate with the observers to determine an 8-hour shift where one observer could be deck sorting while the second observer could conduct factory sampling duties and fish could run over the flow scale. If four observers were aboard, deck sorting and running fish over the flow scale could occur simultaneously at all times.

Also, some vessels did not have an adequate table for the observers to assess halibut on deck. The EFP was modified to specify table dimensions and clarified that halibut needed to follow a single path to the observer.

Finally, when exempting vessel operators from requiring halibut to be returned to sea immediately to allow for deck sorting, the EFP also exempted them from an unintended portion of the regulations. The modified EFP clarified that vessel operators must not lift halibut by the caudal peduncle, throw halibut, or otherwise cause additional injury to halibut. Furthermore, prohibited species other than halibut are not exempted from this prohibition and must be returned to the sea immediately, with a minimum of injury, regardless of condition.

In January 2017, the EFP holders requested that the 2016 EFP (that was modified on January 10, 2017) be renewed without any changes. NMFS renewed the EFP on February 17, 2017, with no changes and extended the EFP until December 31, 2017.

Based on the results from deck sorting operations since January 2017, deck sorting continued to generate significant reductions in halibut bycatch mortality in BSAI non-pollock trawl fisheries. These reductions were achieved in a wider set of non-pollock trawl target fisheries than had occurred in previous EFPs. Additionally, the EFP found that when weather allows, deck sorting could be conducted during winter months. Prior to 2017, deck sorting had never been attempted early in the year due to concerns that there would not be a sufficient number of days with weather allowing for it. The 2017 results showed that deck sorting is workable in winter months even accounting for the times when weather does not allow for it.

Allowing vessel operators to determine the number of observers used for deck sorting was also advantageous as it allowed vessel to adjust the number of observers based on participants' catch volumes, factory production speed, and other factors affecting the way deck sorting was done on their specific vessels.

Sorting on deck beyond the time halibut were viable on deck continued to be a problem for the duration of 2017. Vessel operators may have been using deck sorting to reduce the number of halibut found in the observer's sample in the factory and thereby the observer's extrapolation of halibut bycatch to the haul, rather than the EFP's stated objective of reducing halibut mortality.

2018-19 EFP

The 2018-19 EFP is currently underway. The focus of this EFP is to address outstanding issues that remain important to both the fishery managers and the fishery participants to demonstrate that the eventual implementation of a regulatory program would be successful. The 2018-19 EFP maintains the crew catch handling and other rules from the February 17, 2017 EFP and incorporates new elements intended to allow the fishery managers and the fishery participants to gain experience critical to the upcoming implementation of regulated deck sorting program. The following are the modifications and new elements to the 2018-19 EFP:

1) Each vessel is required to have a deck safety plan that details how safe passage and safe working conditions for observers are incorporated into deck sorting operations. These plans are reviewed and approved by NMFS (Alaska Region and the Observer Program) prior to beginning fishing under the EFP.

2) Some vessels participating in past EFPs fished both in the BSAI and the GOA during the same voyage. Switching back and forth between the BSAI and the GOA created challenges for vessel operators to ensure that halibut are handled correctly under EFP rules governing their BSAI operations and non-EFP rules governing their GOA operations. Differences in procedures on the same voyage can create confusion for crew and observers and increase the potential for incorrect halibut handling. This 2018-19 EFP expanded deck sorting to the GOA for eligible vessels. This will test the feasibility of deck sorting in the GOA given the differences in volumes of catch, size of halibut, and other conditions from previous deck sorting EFPs. As of May 25, 2018, no EFP vessels had used deck sorting in the GOA.

3) The objective of deck sorting is to reduce halibut mortality rates; deck sorting is not to be used for reducing the number of halibut found by the observer sample in the factory. A 35-minute maximum time limit for deck sorting operations was added to help keep participants focused on the objectives of deck sorting.

4) All EFP vessels must use a single chute and maintain a single flow of fish to move halibut from the deck to the table where the observer collects data from sampled fish. A few vessels with multiple paths for fish in past EFPs created challenges for the observers to identify which halibut was to be sampled. Chutes with upper and lower pathways also reduced the observer's ability to keep track of the overall number of halibut sorted per haul.

5) All observer sample tables on deck are equipped with metal length strips attached. This should limit the need for the plastic length strips. The plastic length strips could cause data loss by wearing out or being lost overboard in inclement weather.

6) The requirement for completing a census of halibut in the factory has been removed. Prior EFPs required a census count of halibut in the factory to allow for comparison to the extrapolation of the observer species composition sample in the factory. The results of these comparisons demonstrated that the two numbers track reasonably well over the course of longer periods of time for vessel-specific comparisons and for the EFP overall. Additionally, collecting halibut in the factory was time consuming for the crew and the observer and required additional space in already tight factories. Observers continue to record any halibut encountered in their composition samples. Observers will also return to collecting halibut viability assessments in the factory at the point of discard when feasible. The cameras added to the factory to monitor sorting and storage of halibut for the census of halibut are also no longer required by the EFP.

7) The EFP will continue to test the use of electronic length boards, automated vision-based length measurement technology, and possibly scales for use on deck. These tools may increase sample size, accuracy, and reduce the time required of observers to collect data, which could speed the transfer of halibut back to the water and improve viability.

8) Pre-deployment briefings with NMFS staff were removed and the pre-cruise meeting requirements already in regulations were re-emphasized. Vessel no longer have to wait for the availability of NMFS staff to begin an EFP. Vessel operators must notify NMFS when they have a new observer aboard to schedule a pre-cruise meeting. However, if NMFS staff is unavailable the vessel will be notified that they have met the permit requirement and may begin fishing under the EFP.

1.3.6 CAS Halibut PSC Accounting for Vessels Participating in Deck Sorting EFP

When halibut deck sorting occurs on a non-pollock trawl CP, there are two components of the total halibut PSC in the CAS: 1) the weight and mortality of halibut sorted on deck; and 2) the weight and mortality of halibut in the factory. Observer data collection protocols are explained in more detail in Sections 4.1.1 and 4.2.1 of this Analysis.

Halibut sorted on deck

When deck sorting occurs, the observer collects length and viability data on a subset of halibut sorted on deck. In 2018 for example, a modified systematic sample of sorted halibut is selected comprised of the first 15 halibut selected for discard followed by one out of every five halibut (20 percent) discarded thereafter unless the observer is able to collect data on all discarded fish. The lengths of all the measured halibut are converted to a weight using the IPHC's length weight table. The average weight of the measured halibut is calculated and multiplied by the number of unmeasured halibut to estimate the total weight of unmeasured halibut. The weight of the measured and unmeasured halibut compose the total weight of deck sorted halibut. The total weight of deck sorted halibut reported by the observer is posted in the CAS as discarded halibut.

Next, a halibut DMR is applied to the halibut PSC. The observer identifies the viability, or health, of the halibut from a systematic random sample; note that the additional 15 fish are not included in the computation of mortality rate. The qualitative viabilities assessed by the observer correspond to a quantitative post-capture mortality rate. For each deck sorted haul, a weighted average DMR, based on the weight of halibut at each viability level is calculated. These haul specific DMRs are based on a random sample of fish from the haul, but may be based on a small number of viabilities. That average DMR is applied to the total weight of deck sorted halibut in the haul, calculating a halibut PSC weight, which is posted in the CAS. In the rare event there are no viabilities collected for a deck sorted haul, an annual average DMR from the vessel's other deck sorted hauls is used. If it is the vessel's first deck sorted haul for the year, and there are no other hauls from which to generate an average, then an annual average DMR from the deck sorted hauls of all vessels in the year is used. As other deck sorted hauls are sampled throughout the year and additional viability data become available, the annual average DMRs will be recalculated and reapplied to the vessel's deck sorted haul that is missing viability data.

Halibut recovered in the factory

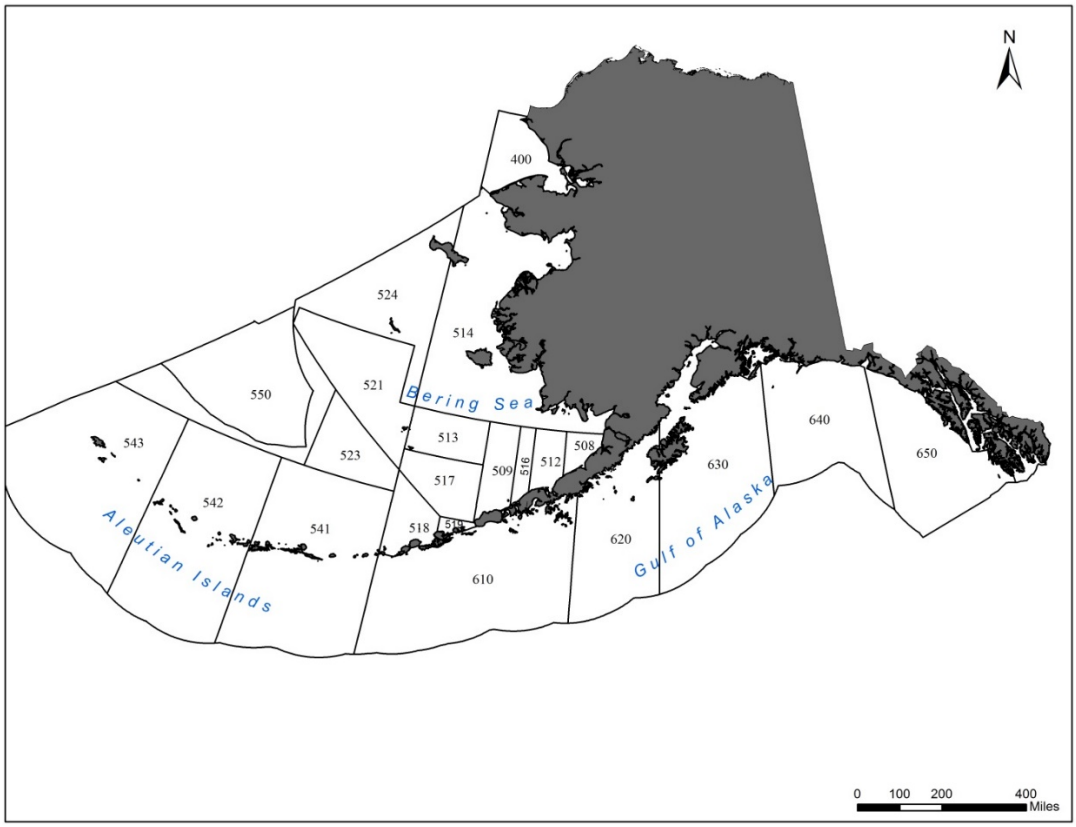
The second component follows the CAS PSC estimation process described in Cahalan et al. (2014), and the weight of halibut in an observer's species composition samples in the factory are extrapolated to the entire haul. In 2015 through 2017, a standard DMR of 90 percent was applied to the halibut recovered in the factory. Beginning in 2018, a DMR is applied to the halibut recovered in the factory based on DMRs published in harvest specification tables in the *Federal Register*. The appropriate DMR is applied based on gear, sector, and year to calculate a PSC halibut mortality weight.

The sum of the two estimates—halibut mortality from the deck sorted fish plus the mortality of fish from the factory—is posted in the CAS.

1.4 Description of Management Area

This action would affect trawl CPs when operating in non-pollock groundfish fisheries off Alaska. (Figure 1).

Figure 1 Bering Sea, Aleutian Islands, and Gulf of Alaska reporting areas.



2 Description of Alternatives

NMFS identified two alternatives for analysis—a no action alternative (Alternative 1) and an action alternative (Alternative 2).

2.1 Alternative 1: No Action

Under Alternative 1, halibut would continue to be sorted after weighing and observer sampling in the factory. Sorting and discarding halibut prior to weighing on the flow scale would continue to be prohibited, and all halibut would be discarded after observer sampling in the factory. Observers would continue to assess halibut in the factory at the point of discard to determine halibut mortality. Halibut deck sorting would continue to be prohibited under existing monitoring requirements, but could continue under an EFP if requested and approved in future years. EFPs are a tool to allow industry to test fishing practices and procedures and must be approved by NMFS.

Under this alternative, regulations would not be changed. Sorting catch on deck would not be allowed. Crew would be required to return halibut to the sea with the minimum of injury after sampling by the observer is complete. Observers would complete normal sampling duties and would assess halibut viability at the point of discard in the factory. The halibut DMR would continue to be calculated using methodology developed by NMFS, the IPHC and in consultation with the Council. Fleet-wide DMRs would continue to be used to calculate the fleet's halibut PSC limit. Existing catch handling and monitoring requirements are designed to ensure observers have access to unsorted catch in the factory. Observer sampling duties on deck would continue to be limited to monitoring the haulback, and catch sampling would continue to occur in the factory, limiting an observer's exposure to safety risks on deck.

An EFP could continue to be used to conduct further research on methods to reduce halibut mortality. Each additional EFP would require an application from the fleet and NMFS review and approval. EFPs are meant to research and test new methods and are not meant to be used as a long-term fisheries management solution. This would mean that additional deck sorting EFPs could occur in the future, but without rulemaking deck sorting would not continue indefinitely.

2.2 Alternative 2: Voluntary Deck Sorting

Allow trawl CPs and motherships participating in non-pollock groundfish fisheries to voluntarily sort and discard halibut on deck. (Preferred Alternative)

Option 1: Apply to vessels while operating in the BSAI Management Area.

Option 2: Apply to vessels while operating in the BSAI and GOA Management Areas.

This alternative would allow CPs and motherships using trawl gear in the non-pollock groundfish fisheries to sort and discard halibut on deck. Additional monitoring tools and modified observer sampling procedures would be necessary to account for halibut sorted on deck prior to weighing in the factory in order to ensure observer data collected on these vessels continues to provide accurate accounting of the amount of allocated species quota harvested and halibut PSC.

Participating vessels would be required to comply with halibut deck sorting monitoring requirements at all times during trips when deck sorting may occur. A vessel would be required to install and maintain equipment as necessary and comply with appropriate catch handling procedures to ensure an observer has the ability to safely complete sampling duties for halibut deck sorting.

Monitoring requirements under this alternative are designed to ensure accurate accounting of halibut PSC sorted from the catch on deck. Monitoring requirements include the following:

- Catch handling and monitoring requirements to ensure an observer can complete data collection duties on deck.
- A sampling station near the point of halibut discard to allow observers to quantify and assess the condition of halibut discarded.
- Video monitoring to verify compliance with catch handling procedures during deck sorting.
- A deck safety plan to ensure observers have safe passage to and from the deck sampling station and to document any know potential hazards while sampling on deck.

Halibut DMRs would be calculated differently for vessels participating in deck sorting and those not participating in deck sorting. This would allow an individual vessel and all vessels fishing under the same halibut PSC limit as the vessel deck sorting to benefit from halibut savings due to deck sorting by using a vessel specific DMR for halibut sorted on deck. This alternative would require significant changes to catch handling as well as the installation of additional equipment to comply with monitoring requirements described in Section 4.2.3. The costs and benefits are further described in Section 4.2.

2.3 Additional Related Regulatory Changes

NMFS has identified the following related regulatory change to remove unnecessary regulations and improve consistency with current and ongoing operational practices.

Remove Amendment 80 Bin Monitoring Option 2

Section 679.93 requires Amendment 80 vessels and catcher/processors not listed in §679.4(l)(2)(i) using trawl gear and fishing in the BSAI to comply with bin monitoring standards specified in § 679.28(i)(1). Changes to these bin monitoring standards are intended to remove unnecessary regulations and improve consistency with current program operations. Option 2—Line of sight option, was last used as an approved bin monitoring option in 2011 and has not been approved by NMFS since then. All vessels required to comply with bin monitoring standards specified at § 679.28(i)(1) have operated under either Option 1—No crew in bin or tank; or Option 3—Video monitoring system option since 2012. Therefore Option 2 is unnecessary and removing it from regulations would not impose any costs or restrictions on the regulated public.

Sampling Station and Bin Monitoring Inspections

Section 679.28 specifies equipment and operational requirements necessary for monitoring a variety of fisheries. Section 679.28(d)(10) and (i)(5) specify requirements for observer sampling station and bin monitoring inspections procedures. Current requirements state that each observer sampling station must be inspected and approved by NMFS one time each year within 12 months of the date of the most recent inspection and that the inspection reports are valid for 12 months from the date it is signed by NMFS. It is important that that each observer sampling station is inspected each year, However, NMFS proposes that it is not necessary to restrict the inspection to within 12 months of the date of the last inspection. Removing the requirement that restricts the validity of these inspection reports to 12 months from the date of the inspection would allow additional flexibility for the observer program to determine the exact length of the approval and potentially synchronize sampling station and bin monitoring inspections with other applicable equipment inspection requirements. This change could reduce the need for vessels to schedule multiple in person inspections at different times of the year, thereby potentially reducing costs of complying with regulations.

2.4 Alternatives Considered but not Analyzed Further

2.4.1 Increase Halibut PSC Limits

The use of halibut PSC limits in the groundfish fisheries reduces halibut bycatch and promotes conservation of the halibut resource. Halibut bycatch in the groundfish fisheries may affect commercial, sport, and subsistence halibut fishing opportunities by decreasing the amount of halibut available for those fisheries. Therefore, the Council and NMFS establish halibut PSC limits to balance the needs of fishermen, fishing communities, and U.S. consumers that consume halibut and groundfish.

A decrease in halibut biomass has been shown in the BSAI.[17] Amendment 80 reduced the halibut PSC allocated to the Amendment 80 sector starting in 2009. The allocation of halibut PSC to the Amendment 80 sector was reduced 50 mt a year from 2009 to 2012 ultimately resulting in an annual reduction of 200 mt of halibut PSC from the Amendment 80 sector. In 2011, the 50-mt reduction was allocated to the CDQ sector. The halibut PSC allocation under Amendment 80 resulted in a total reduction of the annual trawl halibut PSC limit by 150 mt. BSAI halibut PSC limits were reduced 21 percent with the implementation of Amendment 111 to the BSAI FMP (81 FR 24714, April 27, 2016; Table 4). An objective of these reductions was to provide additional directed fishing opportunity in a climate of reduced halibut biomass. The circumstances that led to these reductions have not changed; therefore, this alternative to increase the halibut PSC limits was not further considered.

2.4.2 Require Halibut Excluders

Currently, halibut excluders are allowed but not required. Halibut excluders may not be effective for all vessels because 1) excluders do not exclude small halibut that are similar in size to target catch, and 2) excluders may become clogged with mud in certain fisheries, negatively impacting fishing efficiency. Additional research and development are necessary to determine if the use of halibut excluders could be used to consistently and effectively reduce the amount of halibut caught and therefore, this alternative was eliminated from further consideration.

2.4.3 Require Participation in Halibut Deck Sorting

The costs and benefits of halibut deck sorting are variable depending on the fishery, specific vessel operations, and existing monitoring requirements. Participation in halibut deck sorting could require significant changes to how catch is handled on board the participating vessels, including potentially costly deck modifications, development of deck safety plans, and potentially slower processing as well as complying with all other catch monitoring requirements such as catch weighing, 200 percent observer coverage, and observer sampling station requirements. Due to differences in vessel configurations, it may be more costly or less feasible for some vessels to adapt to the equipment and monitoring requirements and therefore less beneficial to participate in the program. Also, halibut deck sorting may not be beneficial for vessel operators in fisheries where halibut bycatch is low and the costs of deck sorting could outweigh the benefits.

Similarly, severe weather conditions, such as high seas, heavy icing, or extreme winds, may also make deck sorting unsafe at certain times of the year and potentially dangerous to require deck sorting as a year round activity. If deck sorting were required during all hauls and the weather created unsafe conditions to

[17] Described in more detail in Section 3.3.1.1 of the Environmental Assessment/ Regulatory Impact Review For 2018 Pacific Halibut Catch Limits And Associated Management Measures in International Pacific Halibut Commission Regulatory Areas: Area 2C (Southeast Alaska), Area 3A (Central Gulf of Alaska), Area 3B (Western Gulf of Alaska), and Area 4 (subdivided into 5 areas, 4A through 4E, in the Bering Sea and Aleutian Islands of Western Alaska). Available from the NMFS Alaska Region website at http://alaskafisheries.noaa.gov.

perform these activities, this could either limit vessel fishing activity to good weather days, or create situations of non-compliance. Therefore, this alternative was eliminated from further consideration.

2.4.4 Require Advanced Technologies, Such as Scales on Deck, Chute Cameras on Deck, or Electronic Length Boards

Advanced technologies, such as electronic length boards; automated vision-based length measurement technology; chute cameras; or on-deck scales to increase sample size, improve accuracy, and reduce the time required for observers to collect data could speed the return of halibut back to the water and improve viability as well as reduce the time crew and observers were required to be on deck. Industry and NMFS have collaboratively worked together to test the application of these advanced technologies aboard vessels participating in the halibut deck sorting EFP. Research and development is still ongoing. At this time none of these technologies are ready to be implemented fleet wide. Any of these advanced technologies could be implemented in the future once adequate testing for accuracy and reliability has been conducted. For example, an electronic length board or chute camera could be approved as part of the deck sampling station for the purpose of measuring halibut discarded on deck to improve the efficiency of observer sampling under Alternative 2. Additional description of the future application of advanced technologies under Alternative 2 is provided in Section 4.2.2. Because these technologies require further testing before implementation and the use of these technologies is not precluded under the preferred alternative, this alternative was eliminated from further consideration.

3 Description of the Fisheries

The purpose of this section is to provide a baseline synopsis of conditions in the affected fisheries under the status quo conditions. This information is then available to allow comparison of the potential effects of the action alternative on fishery participants with baseline conditions. In this case, the proposed action does not directly affect fishery revenue, allocations, markets, consumers, or communities. The analysis of impacts of the action alternative relies on very limited survey data and comments provided by current EFP participants to characterize the potential compliance costs and operational implications of halibut deck sorting. Thus, the background information provided here is limited to a brief description of the fisheries that is excerpted from the Fleet Profiles prepared by Council staff in 2012 (NPFMC 2012), the Amendment 80 Economic Data Report section of the 2017 Groundfish Economic SAFE (AFSC 2017), the public review draft of a 2017 Council analysis of regulatory changes in the BSAI TLAS fishery (NPFMC 2017a), the Rockfish Program review conducted by the Council in October 2017 (NPFMC 2017b) and the Western Alaska Community Development Program summary (NMFS 2018). These documents are all incorporated by reference here.

Table 7 provides a listing of the CPs and motherships that currently operate in the groundfish fisheries off Alaska and could deck sort halibut if they participated in a non-pollock groundfish fishery in the future and complied with all of the catch monitoring and handling requirements required to deck sort. These vessels represent the universe of potentially directly regulated entities under both the status quo and action alternative. All of these vessels are either Amendment 80 or AFA permitted, or both, or are eligible to participate in Amendment 80. Several of these vessels have operated as motherships in either Amendment 80 or BSAI Trawl Limited Access fisheries in 2017. Also shown is 2017 participation in CDQ fisheries.

Table 7 Currently operating CPs and motherships, their permit sectors, and participation as a mothership and in CDQ fisheries in 2017[18].

NAME	VESSEL ID	A80	AFA	M	CDQ
ALASKA OCEAN	3794		Y		Y
ALASKA SPIRIT	3819	Y			
ALASKA VICTORY	4093	Y			Y
ALASKA WARRIOR	3423	Y		Y	Y
AMERICAN DYNASTY	3681		Y		Y
AMERICAN NO I	1879	Y			
AMERICAN TRIUMPH	4055		Y		Y
ARAHO	34017	Y			
ARCTIC FJORD	3396		Y		Y
ARCTIC STORM	2943		Y		Y
ARICA	3694	Y			
CAPE HORN	2110	Y			
CONSTELLATION	4092	Y			

[18] Additionally, The Cape Flattery, American Enterprise, Endurance, Highland Light, and U.S. Enterprise are federally permitted vessels that have eligibility to participate but have not participated in harvesting and processing non-pollock groundfish as a CP or mothership in recent years.

NAME	VESSEL ID	A80	AFA	M	CDQ
DEFENDER	4635	Y			
ENTERPRISE	5822	Y			
EXCELLENCE	4111		Y	Y	
GOLDEN FLEECE	367	eligible			
GOLDEN ALASKA	1607		Y	Y	
ISLAND ENTERPRISE	3870		Y		Y
KATIE ANN	1996		Y		Y
KODIAK ENTERPRISE	3671		Y		Y
LEGACY	3367	Y		Y	Y
NORTHERN EAGLE	3261		Y		Y
NORTHERN GLACIER	661		Y		Y
NORTHERN HAWK	4063		Y		
NORTHERN JAEGER	3896		Y		Y
OCEAN PEACE	2134	Y	Y	Y	Y
OCEAN PHOENIX	3703		Y	Y	
OCEAN ROVER	3442		Y		Y
PACIFIC GLACIER	3357		Y		Y
REBECCA IRENE	1610	Y			
SEAFISHER	3835	Y		Y	Y
SEAFREEZE ALASKA	2733	Y		Y	Y
SEAFREEZE AMERICA	34249	Y		Y	Y
SEATTLE ENTERPRISE	3245		Y		Y
STARBOUND	3414		Y		Y
UNIMAK	3369	Y			
US INTREPID	2800	Y			
VAERDAL	2123	Y			

Amendment 80

The Bering Sea flatfish fisheries, along with the Atka mackerel and Pacific ocean perch fisheries in the Aleutian Islands, have been prosecuted mostly by a fleet of trawl CP vessels that do not target pollock. This fleet is known as the Amendment 80 fleet. Typically, the fish are processed either with the head and guts removed, or frozen whole. Unreported discards had long been a management concern for this fleet. Historically, in the multi-species flatfish fisheries, the lower valued fish (less valuable species, smaller fish, and fish without roe) were discarded, and only the more valuable fish retained. Vessels did not have meal plants to accommodate low value fish resulting in discards at sea. The race for fish exacerbated this economic discarding as less valuable fish used up processing time and limited freezer space.

To address these discards, the Council required full retention of pollock and Pacific cod, and a minimum groundfish retention standard of 85 percent, which was later removed due to difficult enforceability and the fleet achieving a retention rate higher than the standard once operating under a cooperative program.

To provide the tools for the fleet to increase retention, the Council initiated development of cooperatives in October 2002, and took final action to adopt the program in June 2006, under Amendment 80 to the BSAI FMP. The final rule implementing Amendment 80 published on September 14, 2007 (72 FR 52668). Prior to final action, participation in these fisheries was defined by Congress in section 219 of the Consolidated Appropriations Act of 2005, thus defining the sector and the participants in the Amendment 80 program. To qualify, a vessel must not have been listed as an AFA trawl CP (i.e., non-AFA), be assigned a valid license limitation permit (LLP) with a BSAI CP endorsement, and have processed more than 150 mt of groundfish (other than pollock) from 1997 through 2002.

Among the goals of Amendment 80 is improving economic incentives to increase retention and utilization, and reduce bycatch by the commercial CP fleet using trawl gear in the non-pollock groundfish fisheries. The structure of the program was developed to encourage fishing practices and use of vessel capital with lower discard rates and to mitigate the costs of increased retention requirements by improving the opportunity to increase the value of harvest species while improving operational efficiency and lowering costs.

The BSAI non-pollock groundfish trawl CP sector is composed of vessel-entities representing the 28 CPs with history of harvesting groundfish in the BSAI, but that did not qualify to be listed in the rationalization of the CP pollock fishery under the AFA. Of the original 28 CPs eligible for the Amendment 80 Program, 27 elected to enroll, and there are presently 24 CPs participating. Species allocated to the Amendment 80 fleet include: Aleutian Islands Pacific ocean perch, BSAI Atka mackerel, BSAI flathead sole, BSAI Pacific cod, BSAI rock sole, and BSAI yellowfin sole. In addition, the Amendment 80 cooperatives and vessels receive allocations of Pacific halibut and crab PSC limits for use while fishing in the BSAI, and groundfish sideboard limits and halibut PSC limits for use in the GOA. Amendment 80 allocates the six target species and five prohibited species in the BSAI to the CP sector and allows qualified vessels to form cooperatives. These voluntary harvest cooperatives coordinate use of the target allocations, incidental catch allowances, and prohibited species allocations among active member vessels. From 2008 through 2010, 16 vessels formed a single cooperative (identified as the Best Use Cooperative, renamed AKSC in 2010), with the remainder operating in the Amendment 80 TLAS. In 2011, the Alaska Groundfish Cooperative formed with nine member vessels/LLP licenses. From 2011 to 2017, all vessels are in one of the two cooperatives, AKSC or Alaska Groundfish Cooperative. In 2018, all vessels are in one cooperative.

Production and value information displayed in Chapter 9 of the most recent annual Groundfish Economic SAFE report (AFSC 2017) indicate that the total volume of finished production of the Amendment 80 fleet since 2008, aggregated over all Alaska fisheries, has varied between 181 thousand mt and 218 thousand mt per year, with gross wholesale revenue value varying between $289.7 million and $455.2 million over the period. Aggregate finished volume and value of the fleet over all Alaska fisheries during 2015 were 203.5 thousand t and $350.1 million, respectively, increasing from 2014 by 0.7 percent and 6.8 percent, respectively.

For Amendment 80 target fisheries, finished volume and value for the fleet in 2015 were 159 thousand t and $261.9 million, respectively, an increase by 3.5 percent and 4.3 percent, respectively, from 2014. On a median basis, production volume in Amendment 80 fisheries increased by 8 percent to 8.15 thousand t in 2015, and first wholesale value increased by 12 percent to $11.7 million. Amendment 80 fleet finished production volume from non-Amendment 80 target species catch in the BSAI declined by 3.6 percent to 31.8 thousand t for 2015, while first wholesale value increased by 29 percent to $58.7 million. In contrast, compared to 2014, production volume declined more substantially in median vessel terms, to 1.64 thousand t (-16 percent), and declined in wholesale value by nearly $500 thousand (-18 percent).

BSAI TLAS CPs

Starting in 2008, Amendment 80 established catch shares for several BSAI groundfish species. Amendment 80 also limited access to harvest of Amendment 80 species, including PSC species, by AFA

CPs, AFA CVs, and non-AFA CVs creating the BSAI TLAS fishery. The Council's intent of establishing the BSAI TLAS fishery was to provide harvesting opportunities of some Amendment 80 species by non-Amendment 80 vessels (AFA CPs, AFA CVs, and non-AFA CVs). Each year, NMFS allocates an amount of Amendment 80 species available for harvest, called the initial allowable catch, and crab and halibut PSC to the Amendment 80 sector and the BSAI TLAS sector, with the TLAS allocations representing a small proportion of overall allocation of Amendment 80 species. Allocations made to the Amendment 80 sector are not subject to harvest by participants in other fishery sectors, while the Amendment 80 sector is precluded from participating in the TLAS fisheries (NPFMC 2007). Any portion of the BSAI TLAS fishery not fully utilized may be reallocated to the Amendment 80 sector as cooperative quota on the approval of the NMFS Regional Administrator, but unused Amendment 80 allocations cannot be reallocated to the BSAI TLAS fishery.

This action would allow CPs and/or motherships operating in the TLAS fishery to participate in halibut deck sorting. AFA CPs and motherships that participate in the BSAI TLAS fishery may also participate in halibut deck sorting when operating in non-pollock fisheries.

Central GOA Rockfish Program CPs

The Rockfish Program has developed, over many years, from an open access program to a pilot management program, and finally to the present program, which is authorized through December 2021. The Council designed the Rockfish Program to meet the requirements for limited access privilege programs in section 303A of the Magnuson-Stevens Act. The Rockfish Program includes some similar implementation, management, monitoring, and enforcement measures to those developed under the Pilot Program. Measures that are similar to the Pilot Program are that the Rockfish Program 1) continues to assign quota share (QS) and rockfish cooperative quota to participants for primary and secondary species; 2) allows a participant holding an LLP license with rockfish QS to participate in forming a rockfish cooperative; 3) allows holders of CP LLP licenses to opt-out of rockfish cooperatives for a given year; 4) includes an entry level longline fishery; 5) establishes sideboard limits; and 6) includes additional monitoring and enforcement provisions beyond those required under management of the LLP.

Fifteen CP LLP licenses were issued primary species quota during the Pilot Program. Because of the change in the qualifying years, five of those LLP licenses were not issued QS under the Rockfish Program, and one CP LLP license that was not issued QS under the Pilot Program was issued QS under the Rockfish Program. These changes resulted in 11 CP LLP licenses being issued QS under the Rockfish Program.

Not all the CP LLP licenses that were issued quota during the Pilot Program were assigned to a cooperative. Modifying the program rules to create incentives for these LLP licenses to be assigned to a cooperative was a goal of the Rockfish Program. During 2011, 12 CP vessels and 12 CP LLP licenses were assigned to cooperatives.

Since the Rockfish Program was implemented in 2012 (76 FR 81248, December 27, 2011), two CP cooperatives formed each year, and all the CP LLP licenses issued primary species quota were assigned to one of those cooperatives. The LLP licenses and vessels were assigned to the same cooperatives each year until 2017. During 2017, two LLP licenses were moved from the Best Use Cooperative to the Fishing Company of Alaska. Those licenses were held by the M/V *Savage* and American Seafoods, Inc. The movement between cooperatives was in part due to the sale of the Fishing Company of Alaska and the need for one of the buyers to divest of an LLP license because the QS assigned to the LLP licenses they would have held would have put them over the ownership cap. In 2018, there is one CP cooperative.

Catch, value, and price data for the CP sector are provided in Table 10-2 of the 2017 Rockfish Program Review.[19] Catch increased from 2003 relative to 2016 for Pacific ocean perch and dusky rockfish, but decreased for northern rockfish and sablefish. The increased catch of Pacific ocean perch is correlated to the increased Central GOA TAC, especially over the 2012 through 2016 period. Dusky rockfish catches were relatively stable during the Rockfish Program, ranging from 1,074 mt to 1,207 mt. Dusky rockfish catches were as low as 508 mt in 2016.

The first wholesale value derived from the reported species was greatest in 2011 ($11.73 million) and 2012 ($10.51 million). From 2011 to 2015, the real first wholesale value declined 22 percent to $9.06 million and was lowest in 2013 at $6.97 million. Values declined even though the catch of all the primary rockfish species increased. Reported sablefish catch only decreased by 3 mt over that period. The impact of the strong U.S. dollar likely played a role in the decreasing first wholesale prices over that period. It is important to note that all eligible CPs under this action that participate in the Rockfish Program also participate in the Amendment 80 fleet. Thus, the revenue of these Central GOA rockfish CP cooperatives represents a relatively small proportion of the overall revenue of these vessels.

CDQ Fisheries

The Western Alaska Community Development Quota (CDQ) Program provides western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands fisheries. Six non-profit corporations ("CDQ groups") represent 65 communities with the purpose of economic development in western Alaska and goals to alleviate poverty, provide economic and social benefits to residents, and achieve sustainable local economies. Section 305(i)(1)(C) of the Magnuson-Stevens Fishery Conservation and Management Act requires allocations to the CDQ groups of groundfish, halibut, and crab. Allocations of PSC to the CDQ groups are made under regulations at 50 CFR part 679 and the annual groundfish harvest specifications process. A decennial review allows for adjustments to allocations among the CDQ groups under limited circumstances. The allocations were implemented in 1992 for pollock, 1995 for halibut and sablefish, and 1998 for the remaining groundfish species, crab, and PSC. In 2016, the CDQ groups harvested 249,538 mt of seafood worth $120 million. In the same year, the CDQ groups processed 196,037 mt in seafood volume worth $213.9 million.

Many of the CPs that are eligible to participate in halibut deck sorting also participate in the non-pollock groundfish CDQ fisheries. CDQ fishery vessels may be owned by for profit subsidiaries of the CDQ group or may be independent and contracted by a CDQ group to harvest and process CDQ allocations. This action would directly regulate the owners and operators of CPs and motherships that choose to deck sort halibut PSC in the non-pollock groundfish CDQ fisheries. The alternatives would not directly regulate the CDQ groups or affect their allocations.

[19] The Central GOA Rockfish Program Review is available on the Council's website under agenda item C7 at: http://legistar2.granicus.com/npfmc/meetings/2017/10/965_A_North_Pacific_Council_17-10-02_Meeting_Agenda.pdf

4 Analysis of Impacts

The evaluation of impacts in this analysis is designed to meet the requirement of E.O. 12866, which dictates that an RIR evaluate the costs and benefits of the alternatives, to include both quantifiable and qualitative considerations. Additionally, the analysis should provide information for decision makers "to maximize net benefits (including potential economic, environment, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach." The costs and benefits of this action with respect to these attributes are described in the sections that follow, comparing Alternative 1, no action alternative, with Alternative 2, the action alternative. The analyst then provides a qualitative assessment of the net benefit to the Nation of Alternative 2 compared to no action in Section 4.3.

To assess the potential costs of halibut deck sorting, and potentially some of the benefits of conversion of the EFP to a regulated voluntary halibut deck sorting program, a compliance cost survey was fielded in late 2017. This survey was developed using the existing EFP requirements to define cost categories. Survey questions sought information on costs associated with management of participation and compliance with the EFP, deck safety meetings, observer requirements, on board data management, equipment and vessel modification requirements, and deck sorting labor. Additionally, an open-ended question sought information documenting any additional costs the respondent may have incurred (e.g. vessel modifications or other operational changes) to participate in the halibut deck sorting EFP.

The compliance cost survey used the list of current EFP participants, which includes nine fishing companies operating multiple vessels (see Appendix D). These nine entities were all survey recipients. Initial telephone contact was made with EFP participant representatives to explain the purpose of the survey and to verify email addresses. The survey was then emailed in late November 2017, with an email reminder sent in January 2018. Two completed survey forms were returned. Additionally, one partial survey was conducted over the phone and two partial responses were received via email. Finally, one participant in the EFP who was not defined as a potential survey respondent, and was not a direct recipient, provided an email challenging the appropriateness of the cost of compliance survey and characterizing the cost of halibut deck sorting as an operational (loss of production) cost. Several other participants have indicated agreement with the characterization of costs as largely operational. While this information is helpful, and will be discussed further below, it is identified as a personal communication via email (Gauvin 2018) and is not a survey response.

The little data provided by EFP participants on compliance costs, nonetheless, show that it is not costless to prepare a vessel for deck sorting, nor is it costless for participating fishing companies to manage their compliance and data collection under the EFP. The data that were provided identified costs for multiple vessels; however, too few responses and the fact that vessels differ substantially in size and configuration prevent reporting average cost estimates. What is provided here are the ranges of potential costs that vessel operators may face when preparing a vessel for deck sorting and maintaining necessary equipment, as well as estimates of the management cost of participation and compliance. In this case, the proposed action does not directly affect fishery revenue, allocations, markets, consumers, or communities.

4.1 Analysis of Impacts: Alternative 1, No Action

This section considers the impacts of the no action alternative under two conditions, with and without an EFP.

This section describes the monitoring and enforcement considerations under the status quo for vessels potentially affected by this action. These include CP and mothership vessels that operate in the non-pollock fisheries in the BSAI and GOA. These fisheries include the BSAI Amendment 80 fisheries, non-

pollock trawl CDQ fisheries, the non-pollock BSAI TLAS fishery, CPs in the Rockfish Program, and CPs that are side-boarded in the BSAI and the GOA if they chose to opt out of the Rockfish Program.

This section also describes the monitoring and enforcement considerations for the affected vessels when they are not participating in the EFP, as well as when they participate in the deck sorting EFP. It should be noted that the additional monitoring requirements under the EFP are not required in regulations, but are a condition of the permit to participate. It should also be noted that the deck sorting EFP would likely not continue indefinitely; therefore, if the no action alternative is selected, the vessel monitoring and enforcement requirements reflected in this status quo description would not include the EFP permit conditions.

4.1.1 Observer Data Collection

This section describes relevant observer data collection procedures as determined by the Observer Program and those modified by the AKSC under the status quo. This section includes a discussion of sampling procedures on affected vessels during EFP fishing as well as the status quo without EFP fishing.

Observer sampling without a halibut deck sorting EFP

Monitoring requirements under the status quo without participation in an EFP are designed to ensure accurate accounting of catch and bycatch. This is accomplished by ensuring that all catch is weighed on a is weighed on a NMFS-approved scale and that observers have access to unsorted catch in the factory. Accurate total catch estimates are critical, as the total haul size is the foundation of the estimation of catch and bycatch. Trawl CPs and motherships participating in most limited access fisheries are required to weigh all catch on a motion compensated flow scale to determine a total haul size. The accuracy of these measurements via flow scale are in the order of +/- 3 percent.

The collection of composition data by observers in the trawl fishery has been established to support the various data needs of fisheries managers, stock assessment scientists, and other data users. NMFS Alaska Region relies on observer data collections to generate catch and bycatch estimates for the trawl CPs operating in the BSAI and GOA. These processes are outlined in Conners et al. (2009).

Species composition data include a documented observation of the identity, number, and weight of organisms encountered within one or more samples from a haul. The proportion of these organisms to each other within the samples are extrapolated to the total haul size to estimate the overall makeup of a haul. For trawl vessels, a weight of every organism within a sample is needed for the extrapolation process to function as designed.

With the exception of salmon census data in the pollock fishery, observer species composition data collections on trawl CPs are designed to provide accurate estimations for catch and bycatch at a fishery level. For an individual haul, observer species composition data collection is limited by time, space, species diversity, and availability of unsorted catch. As a result, sample fractions tend to be small which produce estimations with high variance at the haul level. However, when combined over many hauls the estimation process generates more accurate results and can be relied on to represent the actual catch and bycatch amounts for the fishery over time. This sampling approach also compensates for the absence of haul specific composition data when an observer is unable to sample a haul for any reason such as sickness or injury.

Observer sampling protocols are established in the Observer Sampling Manual published and revised by the Observer Program each year.[20] Generally, observers collect multiple random samples of unsorted catch throughout the weighing and sorting of a haul. This sample is typically collected from a conveyor

[20] Observer Sampling Manuals are available on the NOAA Fisheries Website at: https://www.afsc.noaa.gov/FMA/document.htm.

belt located in the factory after the catch has been weighed on the flow scale and prior to sorting. Observers then count, weigh, and identify all catch in this sample and collect additional biological samples such as sex, length, and age structures.

Observer sampling under halibut deck sorting EFP

While participating in the halibut deck sorting EFP, halibut are removed from the catch before they are weighed on the flow scale. In order to determine the total haul size, an estimate of the total weight of deck sorted halibut are added to the weight of the catch that is measured by the flow scale.

To account for the amount of halibut sorted on deck for EFP hauls, and to estimate subsequent halibut mortality, enumeration of the halibut encountered, an estimate of the total weight of those halibut, and an assessment of the condition of halibut at the time of discard is required. The number, size, and condition of halibut encountered on deck is variable and dependent on many factors, including area and depth fished, time of day, haul duration, haul size, catch composition, weather conditions, and crew participation.

Generally, data collection during deck sorting occurs for a limited amount of time after fish are spilled from the codend. Vessel crew identify and remove individual halibut from the catch and convey them to the observer at the deck sampling station where the observer collects data and then discards the halibut back to the sea. The observer counts every halibut sorted from the catch and collects length and viability estimates according to established sampling protocols. These protocols may vary depending on the estimated total population of halibut that may be sorted on deck during the established time period or by changes in data collection procedures established by the Observer Program. An observer may measure every halibut sorted, or collect data on a subset of the halibut sorted. Currently, halibut viability assessments are collected using a systematic random sampling design. Depending on the sampling design used to collect lengths and viabilities, an observer may spend more or less time with each fish prior to discarding. The time it takes to collect necessary data on each halibut directly influences how fast halibut may be discarded from the vessel.

Observers assess halibut viabilities (condition) using a dichotomous key developed in conjunction with the International Pacific Halibut Commission and provide by NMFS. They are required to have the fish in hand and examine both the sides of the fish. Observers are instructed to never guess the condition of a halibut, and to use the dichotomous key for every viability data point collected. The speed that an observer can accurately assess halibut viabilities will depend on the individual observer's familiarity with the dichotomous key and experience level. The condition of the halibut also contributes to the speed at which it can be assessed with the tools provided to the observer.

Under the deck sorting EFPs, observers have been able to successfully collect the required halibut data the majority of the time, but situations have been encountered when observers were unable to complete some or all of these duties. In the absence of observer data to quantify halibut sorted on deck during a specific haul, an alternate source of information may be used. In these situations, estimates of halibut discard and viability would use borrowed data sources such as an estimate from a similar haul or trip. Because of the necessity of observer data, the inability for an observer to complete their duties associated with data collection from deck sorting prevents the vessel's ability to deck sort. In addition, should the observer's data be lost or found to be unusable due to collection errors, no other direct measurement exists to quantify the weight and viability of the halibut encountered on deck specific to the haul.

In the non-deck sorting status quo context, even without the additional data collections required by deck sorting, observers are fully tasked with sampling for species composition and biological information (fish and crab sexes and length, age structures, genetic tissues, etc). Coordination between the observers and crew is essential to ensure the observer has the time to complete sampling duties in both locations, as well as complete data entry and transmission requirements, within a 12-hour work day.

Observers sample for species composition in the factory using a random method by dividing the estimated weight of the haul into equal sized units. The timing for when an observer completes sampling in the factory versus completing deck sorting duties could be problematic if an observer is in the middle of a species composition sample and has to step away to complete deck sorting duties. Also if an observer's intended sample is approaching, and deck sorting is about to begin, effective coordination between factory crew, deck crew and the observer is essential to ensure the observer is able to collect that sample at the randomly chosen weight units. To maintain high data quality, observers must receive assistance from the crew and not be rushed during deck sorting or while completing sampling duties in the factory. Each deck sorted haul could vary based on the size of the haul, diversity of the catch, number of halibut caught, pace and duration of deck sorting activity, and the experience level of the observer.

4.1.2 Enforcement Challenges

This section describes the enforcement challenges under existing regulations for the vessels affected by this action. This section identifies enforcement issues, associated enforcement cases, and ongoing challenges related to observer sampling of halibut bycatch. This section also identifies enforcement concerns identified during EFP fishing.

Since the early 1990's, halibut bycatch has been a concern for fishery managers resulting in strict limits and conservation measures designed to influence fishing behavior and create incentives for fishing vessels to avoid halibut bycatch. These restrictions also created incentives for individual vessels to attempt to influence observer samples so that less halibut bycatch would be reported to NMFS. Two significant sample biasing cases were prosecuted in 2004 and 2005, where crews were found to knowingly bias observer data by presorting halibut from live tanks and by trawling in known areas of high halibut concentration on unobserved hauls. These investigations uncovered methodical and systematic means of halibut bias, identifying a need for improvements to the monitoring and enforcement provisions for the fishery.

In 2008, Amendment 80 was implemented with improved monitoring requirements and a cooperative structure that improved fleet-wide incentives for reducing halibut prohibited species bycatch (72 FR 52668, September 14, 2007). The Amendment 80 Program is described in more detail in Sections 1.3.1 and 3, changes to monitoring requirements included:

- the addition of a second observer so that all hauls could be sampled,
- the addition of flow scales and observer sampling stations,
- bin monitoring standards that included the use of cameras which allow an observer to view all areas where fish may be handled in the fish bin to verify no fish are removed from the catch prior to sampling, and improved sampling protocols and catch handling requirements such as clearing belts and only allowing one conveyor belt from the bin doors to the flow scale.

Though the additional monitoring tool implemented under the Amendment 80 Program improved NMFS' ability to accurately account for catch and bycatch in this fleet, there were still incidents of sample bias and attempted sample bias within this fleet. These actions have typically been either an isolated incident that was recognized, reported, and resolved between an observer and the vessel operator, or an incident that became part of an ongoing investigation. The following is a list of reported behaviors intended to bias observer's samples:

- Diluting an observer's sample when a halibut is visible in the observers sample by running more fish into an observer's sample than requested.
- Sorting or attempting to sort halibut out of the catch in the fish bin prior to sampling.
- Tampering with observer gear or belongings with the intent of delaying a sample to avoid specific fish being in the observer sample or otherwise diverting their attention.

- Pressuring or questioning an observer's sampling techniques persistently with the effect of intimidating the observer or interfering with data collection.
- Failing to stop the flow of fish when requested to do so thus interfering with the observer's established sampling design.

EFP fishing created additional enforcement concerns. The reported biasing behaviors create compliance risks that could impact the observer's work environment and data quality which could reduce the accuracy of the resulting halibut PSC estimates.

During the 2016 EFP, no time limit existed for the sorting of halibut on deck. Deck sorting in the winter months resulted at times in higher numbers of halibut being sorted. Sorting and accounting for all these halibut resulted in longer sorting times on average than had been experienced before. Some hauls with were sorted after about 35 minutes and comprised a high fraction of dead halibut or halibut in "poor" condition, but sorting continued. From anecdotal information from some captains, NMFS learned some vessels were incentivized to deck sort to avoid the uncertainty of extrapolations from observer sampling in the factory.

This created several challenges for the observer. First, the observer was required to remain on deck for extended periods in potentially hazardous conditions. The observer has many duties in addition to collecting halibut lengths and viabilities on deck, and the more time they were required to be present on deck, the less time the observer had to complete these other essential duties. When an observer encounters several hundred halibut to count, assess for viability, and measure, the workload competes directly with other work. This may result in the observer missing their intended sample or making errors that could affect the number, weight, and viability assessment of these halibut.

High numbers of halibut on deck puts increased pressure on the observer to collect quality viability data quickly, with implicit pressure to not use the dichotomous key for assessment. Working quickly in a harsh environment could increase the potential for data errors that could result in inaccurate estimates or sampling methods that are not consistent with Observer Program protocols. The crew and observer's experience levels and demeanor can affect how they deal with the added pressure. Experience early in the 2018-19 EFP demonstrated that some vessel crews sorted the halibut in the catch within the time limit but the observers had several hundred halibut on which to complete counts, lengths, and viability assessments after crew had completed sorting. Additionally, observers reported situations where vessel crew rushed or pressured the observer to move halibut through the sampling process faster than they could handle. This sometimes resulted in data collection errors impacted data quality and the accuracy of the halibut PSC estimates for those hauls. This is a misuse of the time limit imposed, which was meant to ensure that halibut were discarded in the best possible condition, and therefore within a short amount of time, rather than incentivize removing halibut from the catch faster than the observer can measure, assess, and discard them. Enforcement noted that this type of pressure or attempt to interfere with an observer's data collection have been more frequently reported by new observers with less experience. This is a particular concern given that newer observers may need more time to assess halibut mortality prior to discard while deck sorting activities are underway.

Observers have reported halibut mishandling while sorting halibut on deck such as lifting the fish by the caudal peduncle, handling them by the gills, and other rough handling that results in bruising and injury. These methods of crew handling are prohibited and increase halibut mortality.

Communication between the observer and the crew is essential to make sure the pace of deck sorting is suitable for the observer to collect all the necessary information. Communication is also essential to ensure deck sorting is used to return viable halibut to the sea.

4.1.3 Monitoring and Enforcement Tools

Observer Coverage

Amendment 80 CPs and CPs acting as motherships (see 50 CFR § 679.93), Rockfish Program CPs, and Rockfish Program CPs that are sideboarded in the month of July (see 50 CFR § 679.84) are required to carry two observers, one of which must have a lead level 2 endorsement for a CP using trawl gear or mothership. Each observer's workload may not exceed 12 consecutive hours in a 24-hour period. If vessel operations require an observer to work more than 12 consecutive hours to complete sampling and data entry duties, additional observers are required. Motherships and CPs fishing in the BSAI TLAS must also meet these same observer coverage requirements.

CPs that choose to opt out of the Rockfish Program and Amendment 80 CPs fishing under sideboards in the GOA are required to carry one observer. This observer follows a random sampling table to determine which hauls to sample. Vessel operations are not modified to accommodate the observer's schedule.

Pre-cruise meeting

Vessel owners or operators of Rockfish Program and Amendment 80 CPs are required to notify the Observer Program by calling the Dutch Harbor (907-581-2060) or Kodiak (907-481-1770) field office at least 24 hours prior to departure on a trip with an observer who has not deployed on that vessel in the last 12 months. This allows the Observer Program to adequately prepare the observer(s) to successfully collect reliable data necessary for fisheries management.

Pre-cruise meetings provide an opportunity for vessel crew and observers assigned to discuss sampling and vessel operations prior to embarking on a trip. Observer Program participation in pre-cruise meetings allows staff to facilitate this conversation between the observer and vessel crew and resolve questions about sampling expectations, and provide vessel-specific advice about anticipated sampling scenarios that the observer might encounter at sea. Pre-cruise meetings can help improve data quality, reduce conflicts between observers and vessel crew, and can assist vessel operators and managers to comply with observer related regulations.

Under the status quo operations outside EFP fishing, the Observer Program infrequently requires vessels to participate in these meetings and typically only use them to address specific sampling concerns that may arise on a case-by-case basis. Pre-cruise meetings are not required for motherships and CPs fishing in the BSAI TLAS or CPs that choose to opt out of the Rockfish program.

Motion Compensated At-Sea Flow Scale and Observer Sampling Stations

Motion compensated at-sea flow scales (flow scales) are required to be used in the Amendment 80, Rockfish, and CDQ Program fisheries, and on motherships and CPs in the BSAI TLAS fishery. Flow scales are required to allow all catch to be weighed. Because observer samples are extrapolated to the entire haul, catch from each haul is weighed separately on the scale. To facilitate separate weighing, catch from each haul cannot be mixed with other hauls.

Vessels are also required to provide an observer sampling station where an observer can work safely and effectively. Stations must meet specifications for size and location and must be equipped with a motion-compensated platform scale, a table, adequate lighting, floor grating, and running water. Additionally, the observer sampling station must have room to store at least ten observer sampling baskets. These vessels must also have only one operational line for the mechanized movement of catch.

Vessels subject to Amendment 80 sideboards in the GOA, as well as those vessels that opt out of the Rockfish Program, are not required to use a flow scale or have an observer sampling station. These vessels cannot mix hauls and must only have one operational line for the mechanized movement of catch.

However, most vessels subject to the sideboards in the GOA do continue to use the flow scale and make the observer sampling station available for use by the observer.

Video Monitoring

All CPs and motherships required to use a flow scale must have a video monitoring system that shows all areas where catch moves across the flow scale, any access point to the scale that may be adjusted by vessel crew, and the scale display and fault light. These vessels are also required to have a monitor available to NMFS staff.

CPs and motherships participating in Amendment 80 or Rockfish Program fisheries may choose video monitoring of the inside of fish bins as one method of ensuring that catch is not selectively sorted inside the bins prior to observer sampling. Vessels subject to Amendment 80 sideboards in the GOA, as well as those vessels that opt out of the Rockfish Program, may also select this method. This video is used to ensure that fish are not pre-sorted from the catch prior to observer sampling. These vessels are required to have a monitor available in the observer sampling station.

AFA CPs and motherships that may participate in the BSAI TLAS are required to have video monitoring of all areas where salmon are sorted from the catch, of all crew actions in these areas, and provide a view of the salmon storage container. The video is used to ensure that all salmon are available to the observer to conduct a census of salmon at the end of each haul. These vessels are also required to have a monitor available in the observer sampling station. System specifications for video monitoring requirements are detailed at § 679.28(e).

All the above video monitoring systems must meet the following technical specifications:

- 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. The system must record from the beginning of the first trip of the year until the end of the final haul or set for the year.
- The system must include at least one external USB (1.1 or 2.0) port or other removable storage device approved by NMFS.
- The system must use commercially available software that allows for conversion to an open source format such as mpeg.
- Color cameras must have a minimum 470 TV lines of resolution, auto-iris capabilities, and output color video to the recording device with the ability to revert to black and white video output when light levels become too low for color recognition.
- 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 on board 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 record at a speed of no less than 5 frames per second.
- NMFS staff, or any individual authorized by NMFS, must be able to view any footage from any point in the trip using a 16-bit or better color monitor that can display all cameras simultaneously and must be assisted by crew knowledgeable in the operation of the system.

Catch Handling and Observer Sampling

CPs participating in Amendment 80 and Rockfish Program fisheries, vessels subject Amendment 80 sideboards in the GOA, and vessels that choose to opt out of the Rockfish Program are required to comply with catch handling and monitoring requirements designed to ensure that an observer has access to

unsorted catch after it has been weighed on a flow scale. Catch handling requirements defined in §§ 679.84(c) and (d) and 679.93(c) and (d) define catch handling procedures, including allowing no more than one operational line or other conveyance for the mechanized movement of catch between the flow scale and the location where the observer collects species composition samples in the factory. On these vessels, no fish are allowed to remain on deck unless an observer is present, except for fish inside the codend and fish spilled from the codend during hauling and dumping. Fish spilled from the codend must be moved to the fish bin.

Motherships and trawl CPs participating in the BSAI TLAS fishery are not subject to the above requirements specifically, but these vessels are designed with only one line prior to the flow scale and observer sampling collection point. There is no requirement for fish to remain inside the codend on deck unless an observer is present.

Vessel responsibilities at § 679.51(e) require a vessel operator to provide reasonable assistance to an observer in collecting samples as required by the Observer Sampling Manual.

Prohibitions at § 679.7(g) prohibit actions by vessel crew that could bias observer samples, such as physical or mechanical sorting or discarding of catch before sampling. Additionally, vessels are prohibited from tampering with, destroying, or discarding an observer's samples, equipment, or records. These prohibitions apply to all vessel affected by this action.

Monitoring and Enforcement Tools under the EFP

Many Amendment 80 and Central GOA Rockfish CPs, as well as trawl CPs and motherships participating in BSAI TLAS fishery are currently participating in an EFP to allow halibut deck sorting. There are additional monitoring requirements in the EFP permit conditions with which these vessels agree to comply to allow them to sort halibut on deck. Various monitoring tools have been tested and refined since the first deck sorting EFP in 2009. Lessons learned from early years have informed the development and refinement of monitoring and enforcement provisions in later EFPs. These requirements can be found in the 2018-19 EFP permit on the Alaska Regional office website: https://alaskafisheries.noaa.gov/fisheries/efp. In brief these additional monitoring requirements include:

- EFP participants must carry at least two observers (one of whom must have a lead level 2 endorsement for a CP using trawl gear or mothership) and may carry additional observers (up to four) to allow sampling in the factory while sorting occurs on deck. Additional observers may be necessary to ensure compliance with the 12 hour workload restriction and additional observers may help to mitigate potential slowdowns that might occur because fish may not be weighed and sorted while an observer is monitoring deck sorting unless there are two observers available (one to monitor deck sorting and one to perform data collection duties in the factory concurrently).
- Each vessel must conduct a pre-trip meeting to review the details of the EFP requirements with the key crew members and the observers. A pre-trip meeting was a tool used in prior years of the EFP to brief observers and vessel crew about operational details associated with the EFP. This is different than a pre-cruise meeting that is typically only required before an observer deploys on a vessel for the first time.
- Each vessel must notify NMFS and the observer provider at least 7 days prior to beginning EFP fishing for the year to allow timely deployment of observer trained in the EFP protocols.
- Each vessel must contact NMFS at least 24 hours prior to departure on a trip with an observer who has not deployed on that vessel in the last 12 months to conduct a pre-cruise meeting. The Observer Program would conduct this pre-cruise meeting if experimental equipment is deployed on the vessel or the Observer Program or vessel personnel have concerns about EFP sampling protocols aboard the vessel.

- EFP participants must use the motion compensated flow scale to weigh all catch, except halibut sorted on deck.
- The observer sampling station aboard participating vessels described at § 679.28(d) is available to the observer at all times during EFP trips.
- Vessels must have video monitoring of all areas of the deck where fish could be removed from or discarded from the vessel.
- A vessel owner is required to provide a space on deck including a table that meets specifications outlined in the permit for the observer to use to collect data on deck sorted halibut.
- There must be a single pathway for halibut from the trawl deck to the observer's table on deck.
- The vessel crew must follow specific catch handling and sorting procedures, including limiting sorting time to 35 minutes, from the time the codend reaches the stern ramp to last halibut sorted on deck, careful handling of the halibut, and ensuring no deck sorting occurs unless the observer is present.
- Each vessel must have a deck safety plan approved by NMFS that details safe passage for the observer to access and work at the deck sampling station.

4.1.4 Halibut Mortality

As discussed in Section 1.3.2, DMRs are estimates of the proportion of incidentally caught halibut that do not survive after being returned to the sea. The cumulative halibut mortality that accrues to a particular halibut PSC limit is the product of a DMR multiplied by the estimated halibut PSC. DMRs are estimated using the best information available in conjunction with the annual BSAI SAFE reports. NMFS revised methods for estimating DMRs and Table 2 shows the halibut DMRs for the BSAI for 2017.

Once the estimated halibut catch for every haul is calculated, estimated DMRs are applied to estimate the amount of halibut PSC mortality accrued on every haul. See Section 1.3.3 for additional information on halibut PSC mortality calculations.

Trawl CPs and Motherships Participating in the EFP

This section evaluates the effects of EFP deck sorting on halibut mortality. Data for 2016 and 2017 are provided here because they are available in the CAS; earlier data are not available in the CAS.

Table 8 includes all hauls identified as EFP deck sorted hauls in the observer database with deck sorting mortality and includes deliveries from CVs to motherships where deck sorting occurred. Twelve vessels participated in the deck sorting EFP in 2016, and 17 vessels participated in 2017. Net savings, standard halibut mortality minus EFP halibut mortality, are shown in the final column. In 2016, the net savings of halibut mortality on EFP hauls was 267.6 mt. This is the difference between the estimated standard halibut mortality based on DMRs published in the harvest specifications (596.9 mt) and the estimated EFP mortality (329.3 mt). In 2017, the net savings of halibut mortality on EFP hauls was 620.9 mt. This is the difference between the estimated standard halibut mortality based on DMRs published in the harvest specifications (1,633.1 mt) and the estimated EFP mortality (1,012.2 mt).

There are differences between the values reported in Table 7 and the values reported for 2016 and 2017 in the Final 2017 EFP Report (Oliver et al. 2018). For example, NMFS reports 329.3 mt of halibut mortality in 2016 with a net savings of 267.6 metric tons, whereas the EFP Report indicates 331 mt and 290 mt of net savings. NMFS reports 1,012.2 mt of halibut mortality and 620.9 mt of net savings in 2017 compared to the EFP's Report's 1,108 mt and 599 mt. These differences exist because of differences in calculation methods. For example, NMFS uses observer data following debriefing. Debriefing may introduce changes from the raw observer data. For this analysis, NMFS has chosen not to include hauls where mortality is

attributed entirely to halibut recovered in the factory and there was no deck sorted mortality attributed to the haul. These hauls may be from vessels that are participating in the EFP during a trip but that did not deck sort for that haul or they may be hauls where deck sorting occurred but no halibut were encountered during sorting. By excluding these hauls, NMFS' estimation of total halibut mortality for the EFP hauls is lower. NMFS has calculated the "standard" halibut mortality using DMRs in the harvest specification tables, which in 2016 differ from the 85 percent DMR used in the EFP Report for calculating theoretical mortality had deck sorting not occurred. These differences in EFP halibut mortality and standard halibut mortality in turn introduce differences in the net savings calculations.

Table 8 Comparison of halibut PSC mortality using EFP deck sorting DMRs and DMRs published in the *Federal Register* Harvest Specifications for 2016 and 2017.

Year Vessel	Groundfish Weight (mt)	Halibut Catch with No DMR[1] (mt)	EFP (Deck Sorting and Factory) Halibut Mortality[2] (mt)	EFP (Deck Sorting and Factory) Effective Mortality[3] Rate	Standard Halibut Mortality[4] (mt)	Net Savings[5] (mt)
2016						
ARICA	10,488.2	74.4	34.0	0.46	62.8	28.8
CAPE HORN	6,151.8	51.5	27.1	0.53	41.4	14.3
CONSTELLATION	9,669.2	63.9	31.5	0.49	52.5	21.0
DEFENDER	7,606.0	75.2	34.1	0.45	61.2	27.1
KATIE ANN	2,053.8	31.7	11.7	0.37	23.8	12.1
LEGACY	6,546.9	119.8	45.1	0.38	96.0	50.9
NORTHERN GLACIER	7,104.1	61.2	25.3	0.41	51.5	26.2
REBECCA IRENE	10,493.0	87.3	41.9	0.48	72.3	30.4
SEAFISHER	1,777.3	26.0	10.7	0.41	21.9	11.2
SEAFREEZE ALASKA	422.4	6.1	4.1	0.67	5.2	1.1
SEAFREEZE AMERICA	2,172.0	32.8	17.2	0.52	27.5	10.3
UNIMAK	9,394.0	96.2	46.5	0.48	80.9	34.4
ALL VESSELS	73,878.8	726.2	329.3	0.45	596.9	267.6
2017						
ALASKA SPIRIT	266.8	11.2	5.1	0.46	9.5	4.4
AMERICAN NO I	9,949.2	100.1	64.8	0.65	85.1	20.3
ARICA	16,384.1	172.8	98.0	0.57	146.9	48.9
CAPE HORN	13,629.1	125.3	59.8	0.48	106.5	46.7
CONSTELLATION	13,077.8	92.8	45.9	0.49	78.9	33.0
DEFENDER	12,681.1	130.4	66.0	0.51	110.8	44.8
ENTERPRISE	12,419.7	154.6	76.7	0.50	131.4	54.7
KATIE ANN	9,525.5	61.8	31.8	0.51	52.5	20.7
LEGACY	10,744.5	144.3	56.6	0.39	122.6	66.0
NORTHERN GLACIER	17,807.7	87.1	51.4	0.59	74.0	22.6
REBECCA IRENE	14,748.3	146.3	72.0	0.49	124.3	52.3
SEAFISHER	2,979.0	33.8	15.4	0.46	28.8	13.4
SEAFREEZE ALASKA	21,123.1	169.7	95.8	0.56	144.2	48.4
SEAFREEZE AMERICA	22,232.8	222.7	130.7	0.59	189.3	58.6
UNIMAK	20,494.8	199.5	103.8	0.52	169.5	65.7
US INTREPID	6,851.0	55.4	30.9	0.56	47.1	16.2
VAERDAL	1,851.1	13.6	7.3	0.54	11.5	4.2
ALL VESSELS	206,765.5	1,921.3	1,012.2	0.53	1,633.1	620.9

Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data

Note: Includes all hauls identified as EFP deck sorting hauls in the observer data with deck sorted mortality. Includes deliveries from CVs to motherships where deck sorting occurred. Some differences may exist between this summary and information provided in EFP reports due to calculation methods. See additional explanation in text.

[1] Halibut catch includes deck sorted halibut and PSC estimates from halibut recovered in the factory. No DMRs have been applied.

[2] Based on haul specific DMRs, vessel or annual average DMRs for unsampled hauls, and a standard 0.90 DMR for factory halibut.

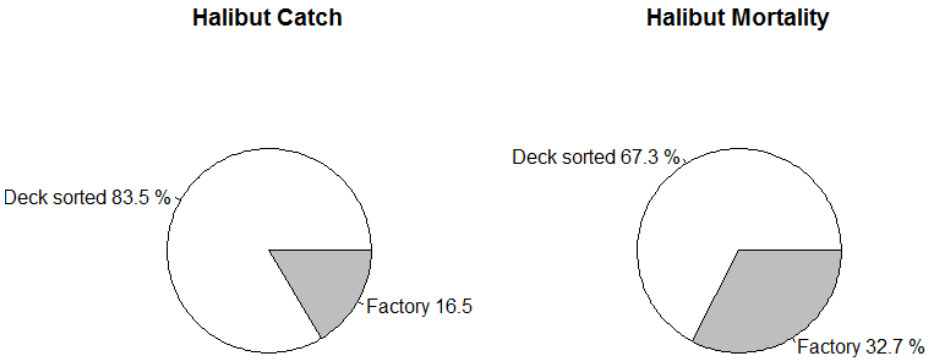
[3] EFP halibut mortality divided by halibut catch.

[4] Based on DMRs published in the *Federal Register* Harvest Specifications (81 FR 14789, March 18, 2016; 82 FR 11843, February 27, 2017). 2016 DMRs applied based on FMP area, management program (CDQ, non-CDQ), gear, and fishery. 2017 DMRs applied based on FMP area, gear, and sector.

[5] Standard halibut mortality minus EFP halibut mortality.

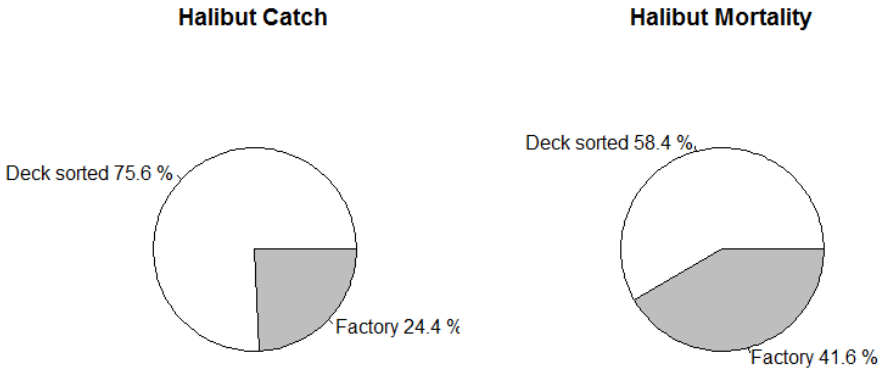
Figure 2 and Figure 3 illustrate the proportion of halibut in the CAS for 2016 and 2017 EFP deck sorted hauls that can be attributed to deck sorting or to estimates from halibut recovered in the factory. In the 2016 and 2017 "Halibut Catch" pie charts, DMRs have not been applied to the estimates of halibut and therefore reflect the total catch. In 2016, 83.5 percent of the halibut catch in EFP hauls was returned to the sea through deck sorting and in 2017, this was 75.6 percent. The 2016 and 2017 "Halibut Mortality" pie charts compare the proportion of halibut catch that were assessed to be dead after being released back into the sea. For deck sorted halibut, haul level DMRs based on observed viability were applied to the catch, and for halibut that were discarded from the factory, standard mortality rates of 90 percent were applied. In 2016, 67.3 percent of the dead halibut were released back into the sea through deck sorting, and in 2017, it was 58.4 percent. In addition to comparing 2016 and 2017, the pie charts illustrate the difference between catch and mortality within the year. Although 83.5 percent of the halibut catch on EFP hauls in 2016 were released after deck sorting that only accounted for 67.3 percent of the halibut mortality. In 2017, 75.6 percent of the halibut on EFP hauls were released after deck sorting, yet that only accounted for 58.4 percent of the mortality. These pie charts illustrate that deck sorting reduces halibut mortality as intended.

Figure 2 Proportion of PSC halibut catch (with no DMR applied) and halibut mortality from deck sorting or from halibut recovered in the factory on EFP hauls in 2016.



Source: NMFS Alaska Region CAS PSC Data.
Note: Includes all hauls identified as EFP deck sorting hauls in the Observer Program database with deck sorted mortality.

Figure 3 Proportion of PSC halibut catch (with no DMR applied) and halibut mortality from deck sorting or from halibut recovered in the factory on EFP hauls in 2017.



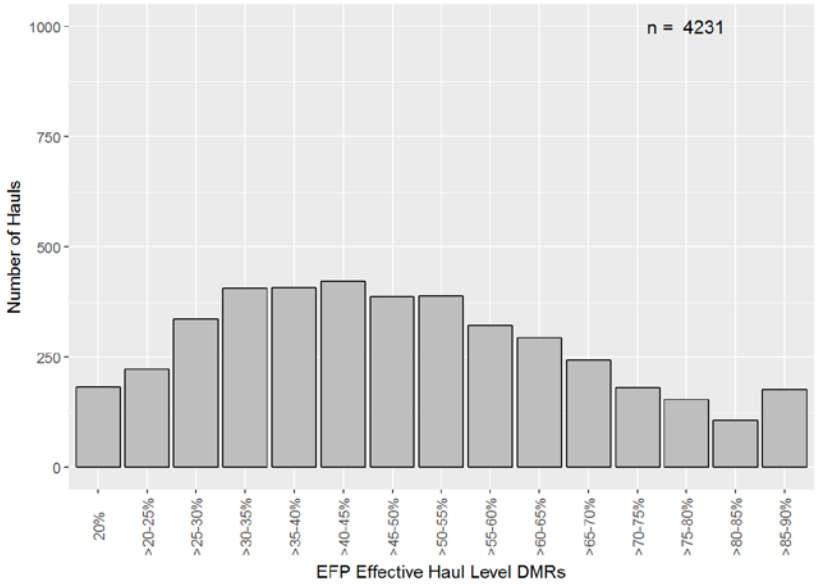
Source: NMFS Alaska Region CAS PSC Data.
Note: Includes all hauls identified as EFP deck sorting hauls in the Observer Program database with deck sorted mortality.

Under non-EFP fishing on a non-pollock trawl CP or mothership, there is a single source of total halibut PSC in the CAS: the weight and mortality of halibut sorted in the factory. However, when halibut deck sorting occurs on a non-pollock trawl CP or mothership, there are two components of the total halibut PSC in the CAS: the weight and mortality of halibut sorted on deck, and the weight and mortality of halibut sorted in the factory (see Section 1.3.6). For Figure 4 through Figure **9**, an "effective" mortality rate was calculated for each deck sorted haul to reflect a single, combined effect of both sources of mortality estimates. The effective mortality rate is a weighted average based on halibut viability estimates collected from halibut sorted on deck and the halibut sorted in the factory. The effective mortality rate was calculated as the total halibut mortality for the haul divided by the total halibut catch for the haul. The effective mortality rates for 2016 and 2017 ranged from 20 percent through 90 percent.

Figure 4 and Figure 5 compare the number of hauls under the deck sorting EFP in 2016 and 2017, respectively, within each range of effective DMRs. The ranges of five percentage points were defined for effective DMRs in these figures simply to facilitate graphing the information. In 2016, nearly 10 percent of the deck sorted hauls had an effective mortality rate greater than 40 percent and up to 45 percent (422 of 4,231 hauls). The largest bar in 2017 reflects effective mortality rates greater than 85 percent and up to 90 percent (1,007 of 10,704 hauls) and reflects nearly 10 percent of the deck sorted hauls

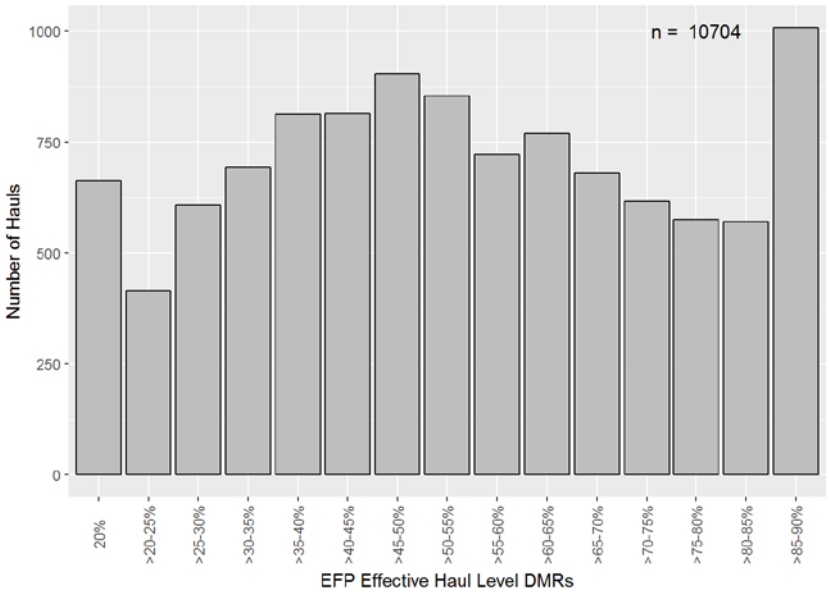
Figure 6 and Figure 7 summarize the amount of halibut catch (mt) on hauls within each range of effective DMRs under the EFP in 2016 and 2017, respectively. When comparing the proportion of halibut catch that occurred on hauls within each range of effective DMRs under the EFP in 2016 and 2017, respectively, over half (55.5 percent) of the halibut catch on EFP hauls occurred on hauls with effective mortality rates less than or equal to 45 percent in 2016. In 2017, approximately one third (39.2 percent) of the halibut catch on EFP hauls occurred on hauls with effective mortality rates less than or equal to 45 percent. This indicates a shift towards a larger proportion of the catch occurring on hauls with higher effective mortality rates in 2017. Some potential reasons for differences between 2016 and 2017 include that deck sorting occurred during different months and aboard different vessels between the two years.

Figure 4 Frequency of EFP effective haul level DMRs in 2016.



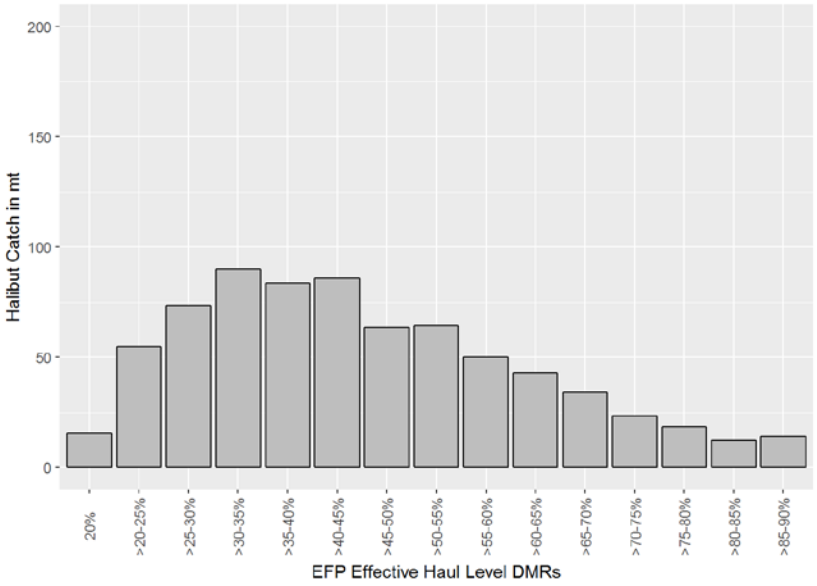
Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: The effective DMRs reflect deck sorted and factory halibut. Hauls with PSC halibut are included whether they were sampled for viability and as a result, whether the haul's EFP DMR, a vessel DMR, or an annual average DMR is used in the CAS. The number of hauls with PSC halibut are indicated (n=).

Figure 5 Frequency of EFP effective haul level DMRs in 2017.



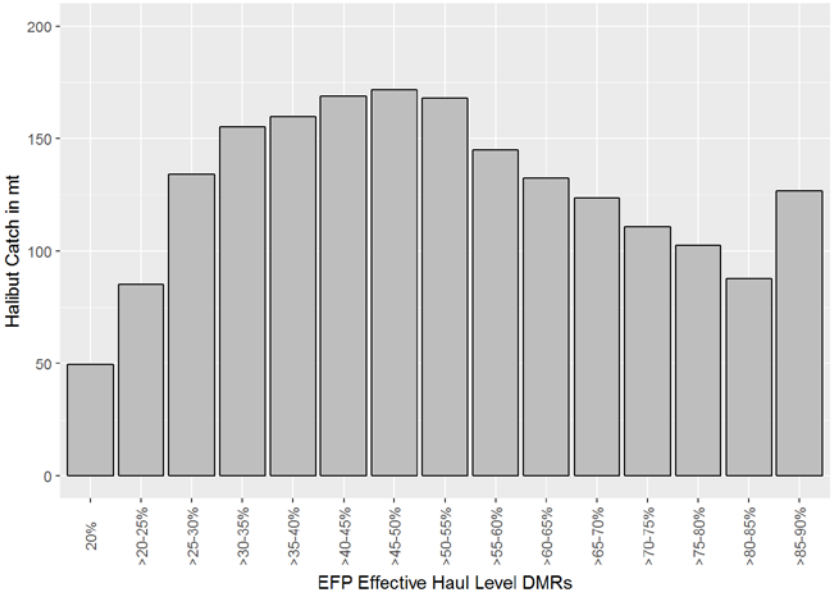
Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: The effective DMRs reflect deck sorted and factory halibut. Hauls with PSC halibut are included whether they were sampled for viability and as a result, whether the haul's EFP DMR, a vessel DMR, or an annual average DMR is used in the CAS. The number of hauls with PSC halibut are indicated (n=).

Figure 6 Halibut catch by EFP effective haul level DMRs in 2016.



Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: The effective DMRs reflect deck sorted and factory halibut. Hauls with PSC halibut are included whether they were sampled for viability and as a result, whether the haul's EFP DMR, a vessel DMR, or an annual average DMR is used in the CAS.

Figure 7 Halibut catch by EFP effective haul level DMRs in 2017.



Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: The effective DMRs reflect deck sorted and factory halibut. Hauls with PSC halibut are included whether they were sampled for viability and as a result, whether the haul's EFP DMR, a vessel DMR, or an annual average DMR is used in the CAS.

Figure 8 and Figure 9 compare the estimated net savings of halibut mortality achieved by EFP hauls within each range of effective DMRs in 2016 and 2017. If the deck sorting EFP had not occurred, and all halibut were discarded from the factory, the CAS would apply DMRs published in the harvest specification tables to halibut catch on a haul to calculate halibut mortality. Those values were calculated for each haul under the EFPs for a point of comparison in this analysis. The "standard" mortality was aggregated for all of the hauls within a range of effective DMRs and depicted in Figure 8 and Figure 9 with black bars. This estimates the amount of dead halibut from these hauls had the deck sorting EFP not occurred. Because the EFP did occur, the CAS applied haul level DMRs to deck sorted halibut and a standard mortality rate to the factory halibut in each haul under the EFP to calculate EFP mortality. These mortality values were aggregated for all of the hauls within a range of effective DMRs and depicted in Figure 8 and Figure 9 with white bars. This estimates the amount of dead halibut on EFP hauls based on the combination of haul level DMRs applied to deck sorted halibut and standard mortality rates applied to any remaining factory sorted halibut. The difference between the "standard" mortality and the EFP mortality values are the net savings for each haul; and are the amount of halibut savings as a result of the EFP. The net savings were aggregated for all of the hauls within a range of effective DMRs and depicted in Figure 8 and Figure 9 with gray bars.

In 2016, the net savings of halibut mortality on EFP hauls was 267.6 mt (Table 7). This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (596.9 mt) and the EFP mortality (329.3 mt). As expected, the larger gains in halibut mortality savings occur on hauls with lower effective DMRs and taper off as mortality rates rise. A small net loss occurs in both years at the highest range of effective mortality rates (>85-90%), where more dead halibut are encountered as a result of the EFP, because the EFP mortality rates applied to the halibut catch at this range are higher than some of the mortality rates in the harvest specification tables. For example, in 2016 the standard halibut discard mortality rate applied to PSC halibut catch in the non-CDQ trawl Atka mackerel fishery was 82% (see Table 1).

In 2017, the net savings of halibut mortality on EFP hauls was 620.9 mt (Table 7). This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (1,633.1 mt) and the EFP mortality (1,012.2 mt). This is more than twice the net savings in 2016, but more than twice the amount of halibut was caught under the EFP in 2017.

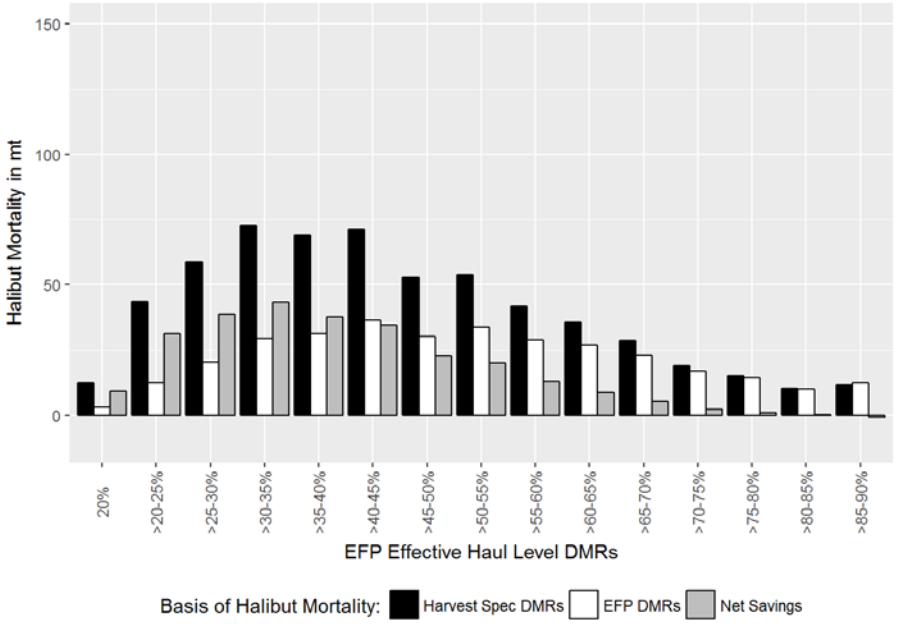
According to an industry report on October 3, 2018, the 2018, the net savings to date, of halibut mortality on EFP hauls in the BSAI was 786 mt.[21] This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (1,926 mt) and the EFP mortality (1,141 mt). This is a 26% increase in net savings compared to 2017, even though there was a 3.8% increase in halibut caught under the EFP in 2018 in the BSAI.

2018 was also the first time the EFP was expanded to include vessels fishing in the GOA and the net savings of halibut mortality on EFP hauls was 58 mt. This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (128 mt) and the EFP mortality (69 mt). Although far fewer groundfish were caught in the GOA (5,407 mt) compared to the BSAI (214,671 mt) in 2018, the effective mortality was similar in both areas (46% and 50%, respectfully).

This analysis was completed prior to the close of the 2018 season. As such, NMFS has not analyzed the data from the 2018 season.

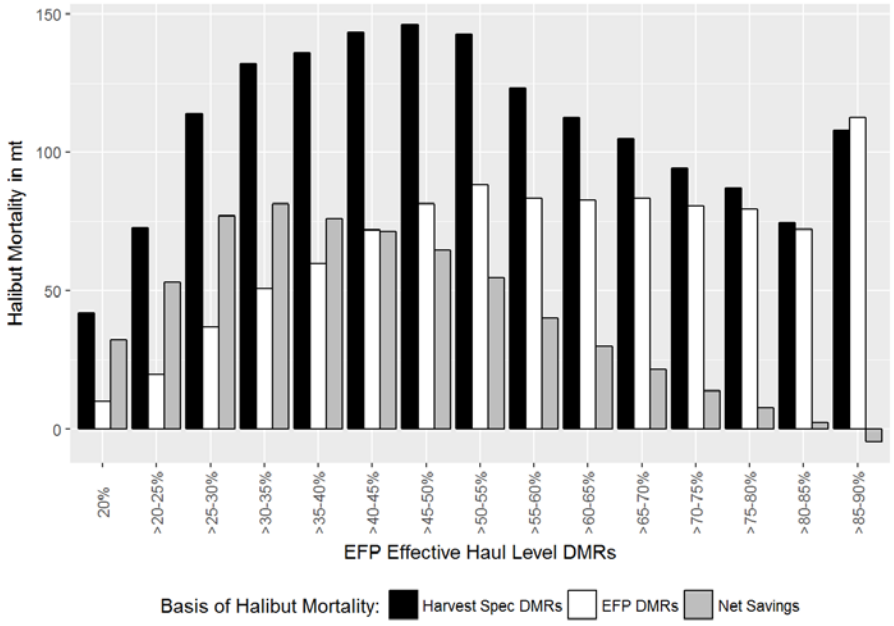
[21] Source: Interim Report on the Halibut Deck Sorting EFP presentation at the October 2018 North Pacific Fisheries Management Council Meeting, by John Gauvin, Beth Concepcion, and Christopher Oliver, Alaska Seafood Cooperative (http://meetings.npfmc.org/CommentReview/DownloadFile?p=756d1adc-8cb6-44a2-bfb9-586c7613d67d.pdf&fileName=%20B8%20EFP%20PRESENTATION.pdf)

Figure 8 Comparison of halibut mortality and halibut mortality net savings in 2016 by EFP effective haul level DMRs.



Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: The effective DMRs reflect deck sorted and factory halibut. Hauls with PSC halibut are included whether they were sampled for viability and as a result whether the haul's EFP DMR, a vessel DMR, or an annual average DMR is used in the CAS

Figure 9 Comparison of halibut mortality and halibut mortality net savings in 2017 by EFP effective haul level DMRs.



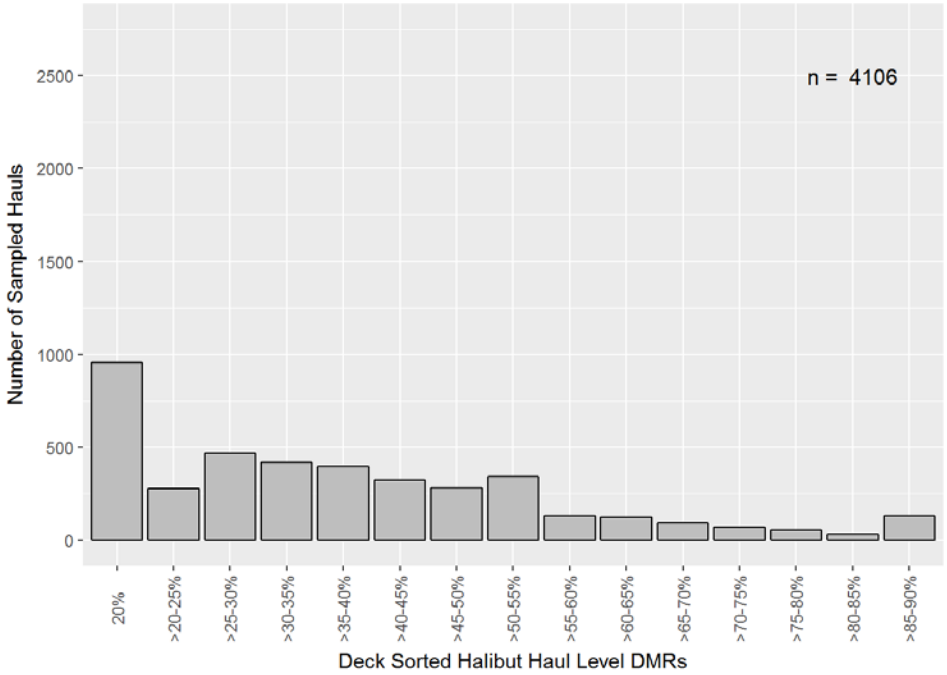
Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: The effective DMRs reflect deck sorted and factory halibut. Hauls with PSC halibut are included whether they were sampled for viability and as a result, whether the haul's EFP DMR, a vessel DMR, or an annual average DMR is used in the CAS.

When halibut deck sorting occurs on a non-pollock trawl CP or mothership, there are two components of the total halibut PSC in the CAS: the weight and mortality of halibut sorted on deck, and the weight and mortality of halibut sorted in the factory (see Section 1.3.6). The previous figures in this section focus on effective mortality rates, which reflect both of these components of halibut PSC mortality in the CAS combined and address the overall impact of deck sorting on halibut mortality. The following figures examine just the contribution deck sorting itself makes toward reducing halibut mortality, irrespective of any factory-sorted halibut on a haul. For Figure 10 through Figure 15, deck sorted halibut haul level DMRs are used to represent hauls. The deck sorted DMR is a weighted average mortality rate based on a random sample of deck sorted halibut assessed for their viability. The mortality rate is calculated based on the weight of halibut in a haul at each viability level. Although two components of mortality are included in CAS, halibut that are recovered in the factory and not deck sorted are not factored into the calculations used for the following figures in this section. In the rare event that a haul was desk sorted and halibut were found and discarded, yet there were no viabilities collected from those fish, an annual average DMR from the vessel's other deck sorted hauls is used in the CAS. If this were the vessel's first deck sorted haul for the year, and there were no other hauls from which to generate an average, then an annual average DMR from the deck sorted hauls of all vessels in the year is used. Hauls in these instances, where viabilities are not sampled, are not included in Figure 10 through Figure 15. In 2016 and 2017, deck sorted DMRs were between 20 percent and 90 percent.

Figure 10 and Figure 11 compare the number of hauls under the EFP in 2016 and 2017, respectively, within each range of deck sorted halibut DMRs. In 2016, 23.3 percent of the deck sorted hauls had a mortality rate of 20 percent (956 of 4,106 hauls). In 2017, that rose to 27.4 percent (2,743 of 10,009 hauls). 80 percent of the halibut returned to the sea from these hauls are expected to survive. A larger proportion of hauls in 2016 have deck sorted DMRs between 20 percent and 45 percent than in 2017 (46.0 percent and 37.8 percent, respectively); however, a larger proportion of hauls in 2017 have deck sorted DMRs greater than 45 percent and up to 90 percent than in 2016 (34.8 percent and 30.7 percent, respectively).

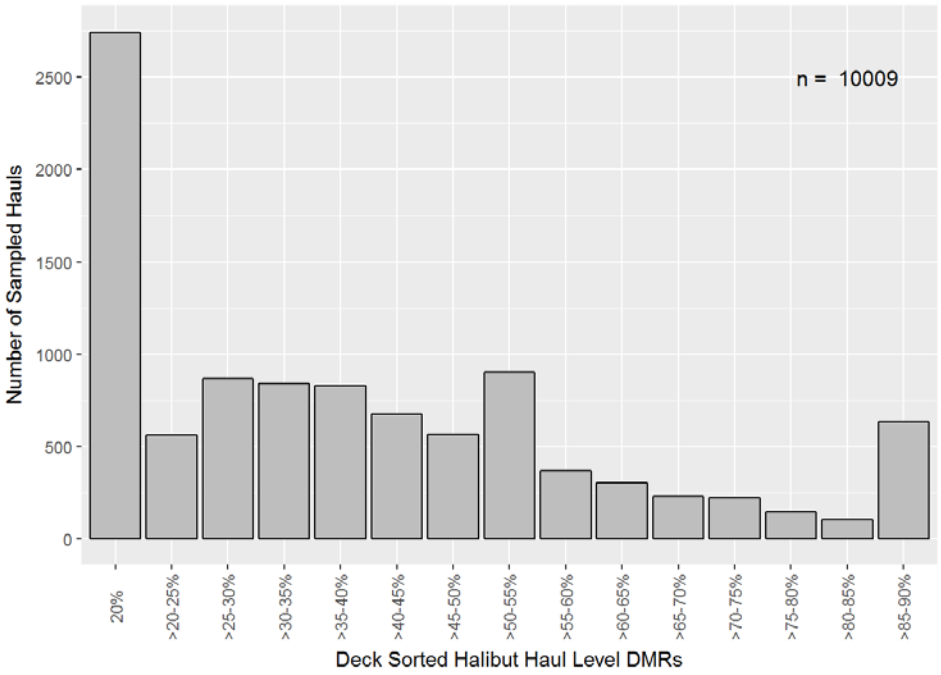
Figure 12 and Figure 13 summarize the amount of halibut catch (mt) on hauls within each range of deck sorted DMRs under the EFP in 2016 and 2017, respectively. In both 2016 and 2017, 13.7 percent of the halibut catch occurred on hauls with a 20 percent deck sorting mortality rate. However, a larger proportion of halibut catch in 2016 occurred on hauls with deck sorted mortality rates between 20 percent and up to 45 percent than in 2017 (61.7 and 51.6 percent, respectively). Conversely, a larger proportion of halibut catch in 2017 occurred on hauls with deck sorted mortality rates greater than 45 percent and up to 90 percent than in 2016 (34.6 percent and 24.7 percent, respectively). This illustrates a shift towards a larger proportion of the catch occurring on hauls with higher deck sorted mortality rates in 2017.

Figure 10 Frequency of deck sorted halibut haul level DMRs in 2016.



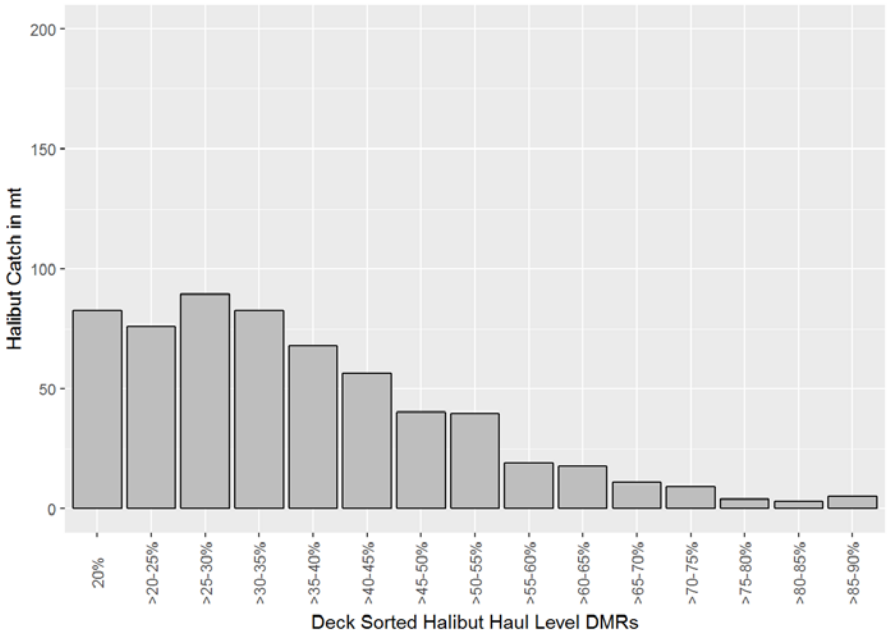
Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: When deck sorted halibut hauls are not sampled for viability, a vessel or annual average DMR is used in the CAS. These unsampled hauls have been excluded from this figure. The number of sampled hauls are indicated (n=).

Figure 11 Frequency of deck sorted halibut haul level DMRs in 2017.



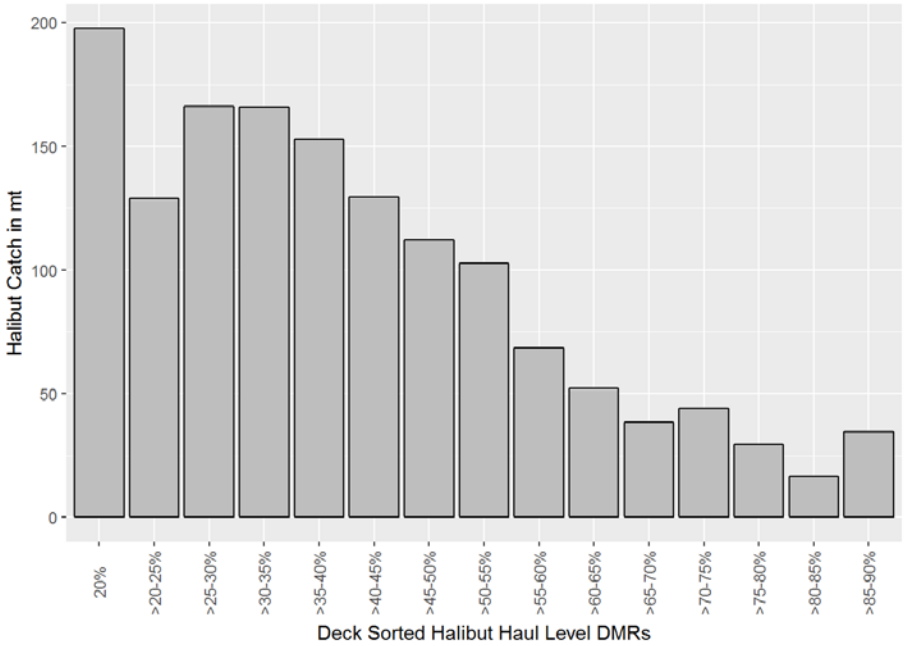
Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: When deck sorted halibut hauls are not sampled for viability, a vessel or annual average DMR is used in the CAS. These unsampled hauls have been excluded from this figure. The number of sampled hauls are indicated (n=).

Figure 12 Deck sorted halibut catch by haul level DMRs in 2016.



Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: When deck sorted halibut hauls are not sampled for viability, a vessel or annual average DMR is used in the CAS. These unsampled hauls have been excluded from this figure.

Figure 13 Deck sorted halibut catch by haul level DMRs in 2017.



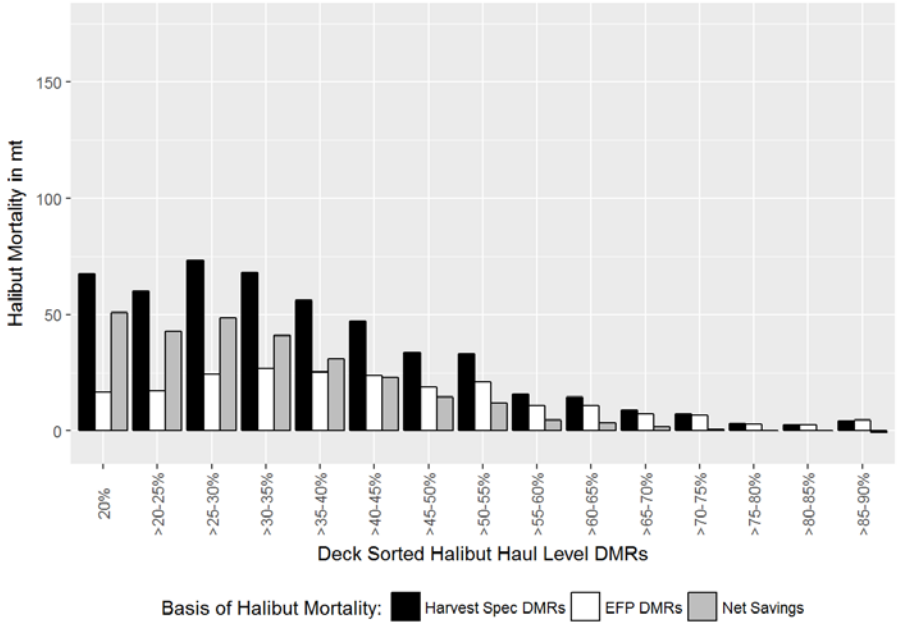
Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: When deck sorted halibut hauls are not sampled for viability, a vessel or annual average DMR is used in the CAS. These unsampled hauls have been excluded from this figure.

Figure 14 and Figure 15 compare the net savings of halibut mortality achieved through deck sorting within each range of deck sorted DMRs in 2016 and 2017. If deck sorting had not occurred, and all halibut returned to the sea from the factory, the CAS would apply DMRs published in the harvest specification tables to halibut catch to calculate halibut mortality. Mortality was calculated for deck sorted halibut on hauls under the EFP using the harvest specification DMRs for a point of comparison in this analysis. The "standard" mortality was aggregated for all of the deck sorted halibut on hauls within a range of DMRs and depicted in Figure 14 and Figure 15 with black bars. This estimates the amount of halibut mortality from these hauls had deck sorting not occurred and the fish been released back into the sea from the factory. Because deck sorting did occur, the CAS applied haul level DMRs to deck sorted halibut catch under the EFP to calculate deck sorted mortality. These mortality values were aggregated for all of the hauls within a range of DMRs and depicted in Figure 14 and Figure 15 with white bars. This estimates the amount of halibut mortality on EFP hauls after being deck sorted and released back into the sea. The difference between those two values are the net savings for each haul; the amount of halibut released in a viable condition as a result of the improved viability achieved through deck sorting. The net savings were aggregated for all of the hauls within a range of DMRs and depicted in Figure 14 and Figure 15 with gray bars.

In 2016, the net savings of deck sorted halibut mortality on EFP hauls was 276.1 mt. This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (497.8 mt) and the deck sorting mortality (221.7 mt). As expected, the larger gains in halibut mortality savings occur on hauls with lower DMRs and taper off as mortality rates rise. A small net loss occurs in both years at the highest range of mortality rates where more dead halibut are encountered as a result of deck sorting, because the deck sorting mortality rates applied to the halibut catch at these ranges are higher than the mortality rates in the harvest specification tables.

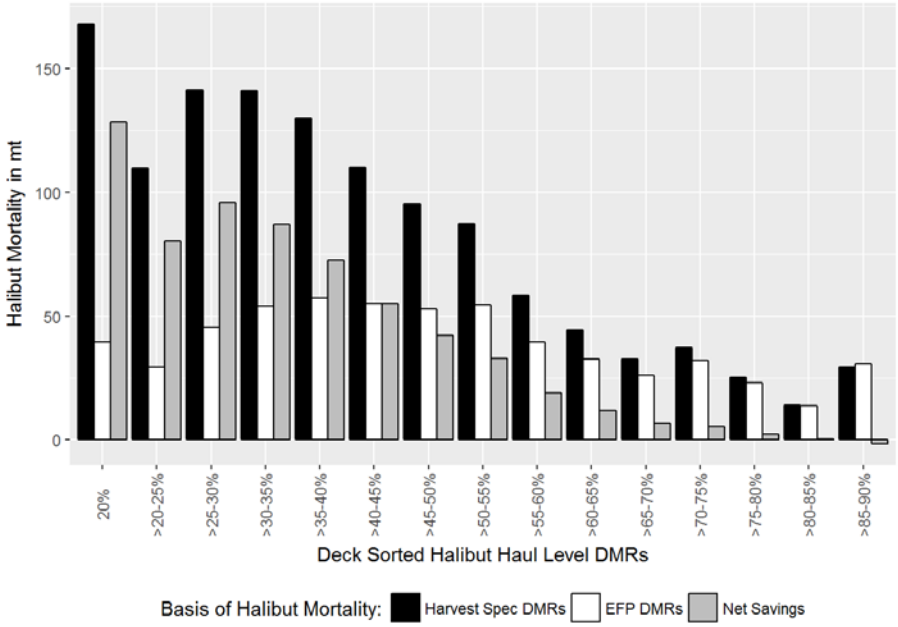
In 2017, the net savings of halibut mortality on EFP hauls was 644.3 mt. This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (1,235.2 mt) and the deck sorting mortality (590.9 mt). In spite of the earlier discussion about how a larger proportion of hauls and a larger proportion of halibut catch occurred on hauls with higher deck sorting mortality rates than in 2016, the net savings in 2017 are more than twice that of 2016.

Figure 14 Comparison of deck sorted halibut mortality and deck sorted halibut mortality net savings in 2016 by haul level DMRs.



Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: When deck sorted halibut hauls are not sampled for viability, a vessel or annual average DMR is used in the CAS. These unsampled hauls have been excluded from this figure. Mortality from halibut recovered in the factory is not included in this figure.

Figure 15 Comparison of deck sorted halibut mortality and deck sorted halibut mortality net savings in 2017 by haul level DMRs.



Source: NMFS Alaska Region CAS PSC Data and Alaska Fisheries Science Center Observer Data.
Note: When deck sorted halibut hauls are not sampled for viability, a vessel or annual average DMR is used in the CAS. These unsampled hauls have been excluded from this figure. Mortality from halibut recovered in the factory are not included in this figure.

Whale Interactions

In reports presented to the Council in February 2016[22] and October 2017[23], the AKSC reported that killer whales had been sighted by some vessels participating in the halibut deck sorting EFP and that the presence of whales could mean the whales were feeding on the halibut discarded from the deck. The report noted that, anecdotally, the presence of killer whales alongside the vessels participating in the 2015 EFP during arrowtooth flounder trips increased compared to the presence of killer whales in the 2012 and 2009 EFPs. In 2015, some vessels fishing arrowtooth flounder were reported to have a continuous presence of killer whales over several days. Where this occurred, whales were at times observed to be near the chute used to discard halibut. To thwart the whales from consuming halibut, participating vessels tried deck sorting while moving the vessel at the speed normally used for transiting between fishing areas (approximately 8 to 10 knots). This appeared to successfully prevent predation because the whales generally opted not to follow the vessel, however there is no data to make a definitive assessment of the success of this deterrent. The effects on halibut mortality of returning halibut to the water while moving at this speed are not known.

Killer whale sightings were again reported around vessels participating in the 2017 EFP in the arrowtooth flounder fishery. Some vessels took evasive measures, such as steaming while sorting to reduce the likelihood of predation on deck sorted halibut. These reports from industry representatives indicate that whale depredation, as well as discarding halibut while traveling at higher speeds, could impact the mortality of deck sorted halibut, potentially biasing the data on which haul-specific mortality is calculated.

In data collected during EFP fishing during 2016 and 2017, observers reported 161 observations of killer whales on eight unique vessels. The number of killer whales reported in observations ranged between 1 and 25. Observations were reported at the haul and trip level and recorded interactions of feeding on discards, feeding on catch, and one record of a killer whale killed by the propeller. The majority of these observations were reported from one vessel over the 2-year period.

Depredation by killer whales and sperm whales has been reported in other fisheries such as the Alaska sablefish and halibut IFQ fishery in the Bering Sea, Aleutian Islands, and GOA (Sigler et al. 2008, Peterson and Hanselman 2017, Peterson et al. 2014). Whale depredation on discarded halibut could reduce the accuracy of mortality estimates which could impact the accuracy of fish stock assessments. Peterson and Carothers (2013) found that in direct response to depressed catch per unit effort associated with killer whale depredation, commercial longliners reportedly react in two ways: dropping their gear back down to "wait the whales out," or moving to a different fishing site to avoid the whales. Both avoidance measures result in reduced efficiency through increased operation costs and opportunity costs in lost time, such as extended soak times and distances traveled (costs of avoiding whales are further discussed in Section 4.7.1 of Halibut Retention in Pots Initial Review Draft[24]). Whale depredation in the longline fishery reduces the efficiency of harvesting the target species of halibut, however, for the trawl fisheries, whale depredation on discarded halibut does not have a negative impact the efficiency of the directed groundfish trawl fisheries. The DMRs calculated under halibut deck sorting do not currently consider the potential negative impacts of whale depredation on discarded halibut.

The collection of these data requires the observer or vessel crew to first recognize the presence of marine mammals around the vessel, which may be limited by weather and light conditions. Once their presence is identified, the animals' behavior must be observed for a sufficient time period to identify their activities,

[22] Agenda Item C5: http://legistar2.granicus.com/npfmc/meetings/2016/2/934_A_North_Pacific_Council_16-02-01_Meeting_Agenda.pdf
[23] Agenda Item D1: http://legistar2.granicus.com/npfmc/meetings/2017/10/965_A_North_Pacific_Council_17-10-02_Meeting_Agenda.pdf
[24] Initial Review Draft Environmental Assessment/ Regulatory Impact Review for Proposed Regulatory Amendment to allow Halibut Retention in Pot Gear in the BSAI, June 2018. Available under Agenda item C5 at http://legistar2.granicus.com/npfmc/meetings/2018/6/982_A_North_Pacific_Council_18-06-04_Meeting_Agenda.pdf.

which is complicated by the observer's requirement to focus on the deck sorting activity and associated data collections. In essence, an observer cannot be in two places at once. As a result of these data collection challenges, observer observations of marine mammals feeding on discarded catch are opportunistic and the ability to extrapolate the data to determine a total is unknown.

Under current observer sampling protocols, the impact of whale depredation is not quantifiable. The documented observations of whale interactions during EFP fishing may be incomplete for a number of reasons. Though monitoring for marine mammals is a high priority for observers when watching the retrieval of the net, during deck sorting activity, the observer is focused on collecting data on halibut sorted from the codend and may or may not be aware of the presence of whales. The location of the deck sampling station may not allow an observer to see if whales are present or if they are feeding on discarded halibut.

4.1.5 Safety

Observer data collection duties include monitoring the retrieval of gear to monitor for marine mammal and seabird interactions on deck. Observers also sample for species composition and collect biological data in the factory. Observers typically monitor gear retrieval from a designated location identified by vessel crew that is out of the way of moving equipment, minimizing time on deck and potential exposure to safety hazards such as falling overboard or injury due to moving equipment. Depending on the vessel, between four to six crew members work on deck during gear setting and retrieval and are exposed to those same safety hazards during these periods.

The risk of falling overboard for both observers and crew depends on the amount of time spent on deck. Deck sorting under the EFP increases the amount of time that an observer and vessel crew spend on deck. This could increase the risk of injury or death due to fishing related accidents. According to the 2017 Commercial Fishing Fatality Summary for the Alaska Region,[25] fishing related fatalities from 2010 through 2014 in the groundfish trawl CP fleet were due to drowning as a result of falling overboard and injuries sustained on board the vessel. Recommendations for preventing fatality from a fall overboard include: wearing a personal flotation device on deck; using a man-overboard alarm system; adding effective recovery devices and re-boarding ladders; and conducting man-overboard drills monthly. Recommendations for preventing on board fatalities include installing safety devices, such as emergency stop buttons, on deck machinery.

During EFP fishing, observers and additional crew are present on the deck of the vessel performing deck sorting duties. When a vessel participates in EFP deck sorting activity, observers and crew are at greater risk for falling overboard because of the increased amount of time spent on deck. Observers are instructed to always wear a personal flotation device when on the deck of any vessel.[26]

During EFP fishing, the vessel captain may decide not to deck sort because of safety concerns. This may occur during bad or inclement weather when there might be a greater risk of falling overboard or injury on deck due to moving equipment. As part of the 2018-19 EFP, vessels are required to submit and have approved deck safety plans that describe safe procedures that the observer must follow to access the deck sampling station and while in the deck sampling station. The deck safety plans also include procedures for the observer to notify the captain or mate if they feel the weather conditions are unsafe for sampling on deck. The observer may also decline to deck sort if the vessel crew is not following the deck safety plan.

Over time, observer data collections have been altered to minimize the need for an observer to be exposed to the trawl deck environment of large CPs. With the implementation of flow scales on most trawl CPs operating in Alaska, observers are no longer required to work around a codend on deck. Aside from data collections from marine mammals and seabirds that have been killed by the trawl gear, the time an

[25] NIOSH report: https://www.cdc.gov/niosh/docs/2017-171/pdf/2017-171.pdf
[26] 2018 Observer Sampling Manual: https://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2018.pdf

observer is required to be on deck is limited to monitoring the gear retrieval from a protected location, sheltered from the trawl gear. Collection of marine mammal and seabird specimen data can be achieved after the trawl gear has been secured, which further limits the observer's exposure to the gear.

Deck sorting operations require the observer to be on deck for extended periods. During the deck sorting operation the vessel crew moves the codend to facilitate the movement of fish. These actions pose a risk to the observer and crew as the gear can shift, cables can part, and lines can break or otherwise present a hazard.

In order to mitigate safety concerns, deck safety plans were implemented in the 2018-19 EFP. The deck safety plan benefits the safety of the crew and observers in several ways. The deck safety plans outline when the observer will transit to the sample station, who will notify the observer when it is safe to do so, what are the approved routes to and from the sample station, and identify hazards in and around the sample station on deck. These plans require increased communication between the observer, vessel crew, and captain regarding all aspects of safety on deck. The observer has the ability to decline to deck sort if the vessel is not following their deck safety plan. The observer has a clearly outlined method to address any safety concerns he or she might encounter, which includes any unforeseen concerns not addressed in the deck safety plan. Finally, the observer is provided direction about how he or she can be safe aboard the vessel.

4.1.6 Costs

Under the status quo without EFP fishing, the cost of complying with monitoring requirements include equipment purchase and maintenance, inspections costs and other costs previously analyzed in other RIRs. This section focuses on the costs associated with participation in the Halibut Deck Sorting EFP and the additional EFP provisions identified in Section 4.1.3. As discussed in the introduction to Section 4, a short cost of compliance survey of existing participants in the halibut deck sorting EFP was conducted. This section summarizes the information collected and is intended to exemplify the costs that would be associated with a vessel participating in halibut deck sorting.

EFP Management

Participation in the halibut deck sorting EFP requires labor associated with the Designated Representative serving as the main point of contact between the permit holder, the principal investigator, the vessel and crew, and NMFS. The Designated Representative also participates in EFP participant meetings and generally manages the day-to-day participation of the fishing company in the EFP. Survey recipients were asked to estimate the annual labor cost of their Designated Representative associated with deck sorting EFP management and compliance (total hours and average wage rate). Survey responses provided example costs estimated at 40 hours, or one week of work, annually, at a labor cost per hour ranging from $65 to $75 per hour, or approximately $2,600 to $3,000 in labor cost annually.

Pre-trip Meeting, Observers, and Data Management

It is a requirement of the EFP that pre-trip observer meetings be held to discuss the expectations and requirements for halibut deck sorting trips. These meetings involve the vessel master and potentially other vessel crew that may interact with the observers. Potential respondents were asked to estimate the labor cost of pre-EFP trip meetings (total hours and average wage rate). It is important to understand that most of the individuals that would be involved in these meetings do not generally receive an hourly wage, as crew share or a combination of base salary and crew share of trip revenue are common forms of compensation in the potentially affected fisheries. This was discussed with potential respondents in phone conversations and in the survey transmittal email and it is acknowledged that these estimates are difficult to make. For that reason, the wage rate is defined as an average wage rate inclusive of all forms of compensation, and the respondent's best estimate of that wage rate was requested. Current participants in

the EFP who responded to this question indicate that the vessel master regularly meets with observers prior to the trip and that the EFP has not added any cost to those meetings.

Potential respondents were also asked to estimate any labor costs on board the vessel associated with observer notifications of the intent to deck sort halibut, as well as whether they had carried additional observers on board to facilitate deck sorting. Potential respondents were also asked to estimate the cost of vessel operator compliance with data management requirements under the EFP (hours per day when participating and average estimated hourly wage rate). No costs of observer notifications were indicated and only one respondent indicated carrying an additional observer for 148 days during 2017. Each additional observer increases observer coverage costs and requires an additional bunk space. The additional observer costs for this vessel were reported to be $350 per day, or $51,800 for the 2017 fishing year. Respondents estimated that data management compliance costs are derived from about 15 minutes of additional labor time per haul and costs are estimated to range from $50 per day to nearly $100 per day with reported time required being approximately one to two hours per day. Of course these costs will vary with the numbers of hauls completed on a vessel during deck sorting in any given day of fishing.

The single response in the cost of compliance survey question response regarding use of an additional observer to allow fish to continue to be run across the flow scale below decks while also deck sorting halibut creates the potential for non-response bias. To further inform this analysis the additional annual observer days used by each vessel while fishing under the EFP has been queried from the North Pacific Observer Program database for 2016 through 2018. The North Pacific Observer Program annual reports provide the average daily cost across all trawl CPs and this average cost has been applied to the additional observer days data to estimate total annual cost by vessel and for the EFP participants as a group total.

Table 9 shows that 12 EFP participating vessels carried an additional observer in 2016 with observer days ranging from as little as eight to as many as 175 days. Total cost per vessel in 2016 ranged from $3,032 to $66,325. In 2017, just four vessels carried an additional observer from between 17 and 225 days and costing from $6,477 to $85,725. Four vessels, 3 from 2017 and another that had not carried an extra observer in 2016 or 2017 carried an additional observer in 2018. However the new participant only carried an additional observer for 5 days, while the three other vessels carried an additional observer from 198 to 280 days with 2018 costs ranging from $1,905 to $107,442. Also of note is that the three vessels that carried an additional observer for most of all of their fishing in 2018 have carried an additional observer for varying numbers of days in each of 2016 and 2017.

In total, 1,142 additional observer days were tabulated in 2016. That number had fallen to 542 in 2017 but increased to 765 in 2018. Total costs incurred by EFP participants to carrying an additional observer are estimated to have been $432,818 in 2016, $206,502 in 2017, and $291,465 in 2018.

Table 9 Additional observer days and annual total cost estimate by EFP participating vessels, 2016-2018.

Vessel Name	Annual Additional Observer Days and Annualized Cost Per Vessel					
	2016 days	2016 Cost: $379/day	2017 days	2017 Cost: $381/day	2018 days	2018 Cost: $381/day
Araho					5	$1,905
Arica	118	$44,722				
Cape Horn	136	$51,544				
Constellation	135	$51,165				
Defender	133	$50,407				
Katie Ann	39	$14,781	130	$49,530	198	$75,438
Legacy	152	$57,608				
Northern Glacier	85	$32,215				
Rebecca Irene	175	$66,325				
Seafisher	19	$7,201				
Seafreeze Alaska	8	$3,032	225	$85,725	282	$107,442
Seafreeze America	45	$17,055	170	$64,770	280	$106,680
Unimak	97	$36,763	17	$6,477		
Annual EFP Total	**1142**	**$432,818**	**542**	**$206,502**	**765**	**$291,465**

Source: North Pacific Observer Program Database. 2016 and 2017 Program Annual Reports (Figure 2-1)
Note: Price data is the trawl CP average of total daily cost, 2017 data is used to proxy 2018

Video Monitoring and Additional Equipment Costs

Potential respondents were asked to estimate the cost of the installed deck sorting video monitoring system. Estimates of equipment cost, installation cost, and any ongoing operation and maintenance costs were requested. Additionally, estimates of the added cost of materials necessary to allow halibut deck sorting under the EFP (e.g., observer work table, ramps, chutes, belts) were requested. Video monitoring equipment reportedly costs from $10,000 to $16,000 and can require between $1,000 and $4,000 in annual maintenance costs. Additionally, the cost to fit the vessel with the required deck sorting equipment ranged from approximately $12,000 to $20,000.

Deck Sorting Labor Costs

Potential respondents were asked to estimate the daily crew time and average wage rate per hour required to perform deck sorting as well as factory sorting if applicable. Deck sorting reportedly uses six people, and the duration of the sorting per day depends on the number of hauls that can be completed given fishing conditions. Respondents estimated daily total time taken for deck sorting to be between one and two hours, with total per day costs estimated to range from $200 to $500 per day. Factory sorting costs were identified as being the same with or without deck sorting.

Operational Costs

The last survey question provided potential respondents with an opportunity to describe any additional costs they may have incurred to participate in the deck sorting EFP (e.g., vessel modifications or other operational changes). This open-ended question was responded to by all respondents and one additional non-respondent in a personal communication. One respondent indicated an additional $2,500 in vessel costs, presumably for an additional observer. However, the general consensus of all respondents is that the real impact of halibut deck sorting is not the cost of compliance, equipment, or additional observers.

To assess the full impact of halibut deck sorting one must consider the effect it has on the fishing operation and the factory operation.

Several respondents indicated that the on-deck activities during deck sorting result in two direct effects on operations. The first is that the deck crew takes up to 30 minutes to sort through the catch and allow the observer to measure and evaluate halibut. This is time that cannot be spent fishing because the gear is onboard the vessel and cannot be set until deck sorting is concluded. Second, processing is affected as no fish can be run over the flow scale while deck sorting is occurring, unless additional observers are present. This limitation significantly slows factory production. Respondents indicate that Amendment 80 CPs typically make between four and six hauls a day when not deck sorting, with operational ability likely constrained by vessel size and fishing conditions. The amount of time taken to deck sort per day is thus from two to three hours per day per vessel. Respondents indicate that this delay, along with factory slowdown, equates to one lost haul per day for each participating vessel.

The potentially forgone revenue impact from one lost haul per day per participating vessel is difficult to independently quantify with catch data and industry reported prices. Vessels participating in deck sorting fish for a variety of species at different times of the year and offload frozen packaged product for shipment to markets around the world. Identifying the value of an individual or "typical" haul is, therefore, problematic. Further, some fishing companies indicate that they shorten their haul length to improve product quality and to improve the viability of deck sorted halibut. Respondents who did provide estimates of these additional operational impacts as potentially forgone revenue indicated that the value can range from approximately $25,000 to $75,000 per haul, per day, and per vessel participating in deck sorting.

Table 10 Summary of Survey Responses

Example Cost of EFP Compliance	
EFP Management	$2,600-$3,000 annually
Pre-trip Meeting	no added cost
On Board Observer Notifications	no added cost
Additional Observer	1 vessel, $58,800 annualy
Data Management	$50-$100 per day depending on number of hauls
Deck Video Install	$10,000-$16,000 installation
Deck Video Maintenance	$1,000 to $4,000 annually
Deck Sorting Equipment	$12,000 to $20,000
Deck Sorting Vessel Labor Cost	$200-$500 per day
Operational Cost	$25,000 to $75,000 (loss of a tow) per day

To mitigate the potentially forgone revenue due to lost fishing time when halibut deck sorting, vessels will fish longer each season. Participants in the Amendment 80 fleet who have testified to the Council regarding the costs of halibut deck sorting have indicated that the forfeit of one haul per day of production on average adds up to the loss of one month of production over the course of the season. In other words, EFP participant vessels have had to fish/process an additional month per year during halibut deck sorting to achieve the same amount of finished product and a similar level of total annual gross revenue.

It is possible to use data provided by the Amendment 80 fleet in their annual Economic Data Reports to estimate the potential impact of the operational cost aspects of halibut deck sorting. Amendment 80 vessels have reported that the number of days fishing and processing by the median vessel in Amendment 80 fisheries in the BSAI in 2016 was 202 days (AFSC, 2017, Table 9.6 page 254). Thus, an additional 30 days of fishing, for the median vessel in the fleet, equates to roughly a 15 percent increase in the time

spent fishing in order to mitigate potentially forgone revenue due to halibut deck sorting. The Amendment 80 median vessel reported annual wholesale value of final product of $11.67 million in 2016 (Table 9.7 page 257), and the fleet-wide operating cost per vessel-day slightly exceeded $44,000 per day (Table 9.9, page 267). Applying fleet-wide cost per vessel day to the 30 additional days reportedly needed to mitigate the effects of deck sorting results in approximately $1.3 million in added cost, which is a 15 percent increase in costs and represents roughly 11 percent of median vessel annual revenue in 2016. Thus, if halibut deck sorting results in the loss of one haul per day and an additional 30 days of fishing is required to mitigate that revenue, the added cost of mitigation, based on fleet-wide averages, could exhaust net revenue in years where revenue is relatively low or for some vessels operating below median revenue levels. It is quite possible that some vessels may find participation in halibut deck sorting does not allow profitability in all fishing conditions and this may limit participation in the voluntary program.

As discussed above, EFP participants have indicated that losing a haul per day can extend their fishing operations within a season. More fishing days on the grounds will result in greater fuel consumption; however, harvest levels of target species, incidental catch, and PSC limits are all controlled by existing allocation regulations and NMFS In-Season Management and will not be affected by this action. In addition, all harvesting activity aboard participating vessels will continue to occur within presently defined season lengths established in regulation. Thus, vessels will not be operated outside of the currently defined fishing seasons that they are allowed to operate within under the status quo condition. Thus, it is not anticipated that the lengthening of fishing operations within presently allowed fishing periods will result in environmental consequences not previously considered in establishing existing season lengths, harvest allocations, and management measures.

In addition to the costs of compliance and operational costs of the halibut deck sorting EFP, there are also costs associated with management of the EFP by the principal investigator, and AKSC, NMFS Alaska Region, and Observer Program staff. The principal investigator spends considerable time monitoring vessel activities under the EFP, answering questions from participants by satellite phone and email, and attending bi-weekly meetings with NMFS Alaska Region and Observer Program staff to address problems and questions from vessels participating in the EFP. A “ball park” estimate of those costs for management of the EFP is approximately $150,000 annually. Thus, conversion of the halibut deck sorting EFP to a regulated program would allow those resources to be used to more efficiently to manage the operations and other research of the cooperative and are thus considered here to be an opportunity cost.

Another operational cost is related to the amount of time an observer spends using vessel equipment to enter and send data. Regulations at 679.51(e) require vessel operators to allow the observer to use vessel equipment for the purpose of observer data entry and transmission. During EFP fishing, observers collect additional data that must be entered and transmitted to NMFS. This may require the observer to use vessel equipment for additional time to enter and transmit EFP data. Some vessels have designated equipment for the observer’s use that is available at all times and this additional usage would have no impact on these vessels. On vessels where this equipment is shared by the crew, this additional time necessary for the observer to enter and transmit observer data may limit the amount of time the equipment is available to vessel personnel.

Agency Costs

NMFS Alaska Region and Observer Program staff participate regularly in meetings with the EFP participants and the principal investigator. Observer Program staff have instituted additional observer training materials, made database changes, and established data quality control checks associated with deck-sorted halibut data collection. Observers participating in the EFP collect more halibut information, which increases debriefing time after observers complete their deployments. These staff costs are part of the overall program of fisheries science and management at NMFS and are not tabulated to identify specific costs of EFP management by Federal employees.

The conversion of the halibut deck sorting EFP to a regulated program would alleviate the labor burden to process, monitor, and manage the EFP for the Alaska Region, albeit while likely adding other elements of management, monitoring, and compliance including additional cost to NMFS OLE for compliance monitoring and investigations. These agency costs are also opportunity costs and elimination of the EFP will allow some staff time to be used to more efficiently manage Alaska fisheries, albeit with some added cost of enforcement. Observer Program staff would not be expected to realize labor savings with the conversion from an EFP to regulated program as the data collection protocols, associated training, and data quality control measures would continue under the regulated program.

4.1.7 Benefits

The primary benefit to participants in a halibut deck sorting program is reduced halibut mortality accrual against the applicable PSC limit. This benefit is realized via the estimation of reduced halibut DMRs, on a haul–by-haul basis, when halibut can be sorted from the catch on deck and observers can determine that deck sorted halibut have a higher viability than factory sorted halibut. The extent to which this benefit will accrue depends on many factors such as length of haul, time halibut spend out of the water, the volume of halibut sorted, and the overall volume of fish in the haul. For example, halibut deck sorting under the 2012 EFP in the high volume yellowfin sole fisheries proved to be problematic and improvement of methods in that target fishery was a specific objective of the 2015 EFP (EFP 15-02 final report[27]).

Section 1.3.5, analyzes the discard mortality of halibut within the EFP. Using CAS data, the net savings of halibut mortality as a result of the EFP were tabulated on a haul-by-haul basis. The net savings were then aggregated for all of the hauls within a range of effective DMRs and depicted in Figure 9 and Figure 10 with gray bars.

As discussed in Section 1.3.5, in 2016, the net savings of halibut mortality on EFP hauls was 267.6 mt (Table 7). This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (596.9 mt) and the EFP mortality (329.3 mt). As expected, the larger gains in halibut mortality savings occur on hauls with lower effective DMRs and taper off as mortality rates rise. A small net loss occurs in both years at the highest range of mortality rates where more dead halibut are encountered as a result of the EFP because the EFP mortality rates applied to the halibut catch are higher than they would be under the rates in the harvest specification tables.

In 2017, the net savings of halibut mortality on EFP hauls was 620.9 mt (Table 7). This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (1,633.1 mt) and the EFP mortality (1,012.2 mt). This is more than twice the net savings in 2016. The net savings of halibut on EFP hauls exemplifies the potential benefits, in terms of reduced halibut mortality, that participants in deck sorting of halibut may achieve under this action.

4.2 Analysis of Impacts: Alternative 2

This section describes the monitoring and enforcement considerations for Alternative 2—Allow trawl CPs and motherships participating in non-pollock groundfish fisheries (which includes Amendment 80, trawl limited access, CDQ, and any mothership activity to or from those vessels). Vessels may voluntarily decide to participate in halibut deck sorting by complying with monitoring and enforcement requirements designed to allow halibut to be sorted on deck while ensuring that observer data continue to provide reliable estimates of catch and bycatch species. This alternative includes two options: 1) deck sorting could occur while operating in the BSAI Management Area; and 2) deck sorting could occur while operating in the BSAI and GOA Management Areas.

[27] Available at https://alaskafisheries.noaa.gov/fisheries/efp

Trawl CPs that conduct deck sorting activities in the GOA trawl fisheries would be required to comply with the same monitoring requirements as vessels that conduct deck sorting activities in the BSAI. All vessels participating in the deck sorting program would be required to comply with these monitoring requirements while fishing in either the Amendment 80 or Rockfish Program sideboard fisheries in the GOA, the Rockfish Program, or vessels that choose to opt out of the Rockfish Program. The F/V *Golden Fleece* would have to meet additional monitoring if they were to participate in this program because more of the equipment and monitoring requirements under this program would be new requirements such as the catch weighing, two observers, and sample station and bin monitoring requirements that are components of monitoring requirement for vessels participating in other limited access fisheries.

4.2.1 Observer Sampling

Under Alternative 2, the Observer Program would continue to determine observer sampling protocols, train observers how to use these protocols and evaluate Agency data needs to manage the fisheries. Observer sampling procedures will continue to be documented annually in the Observer Sampling Manual (NMFS 2017). The speed which an observer can collect the necessary data for halibut deck sorting would limit the speed which halibut could be discarded because under Alternative 2, every halibut would be required to be made available for observer sampling. This means that vessel crew providing halibut to the observer at the deck sampling station would need to monitor the rate which halibut are provided to the observer so to not overwhelm the observer or interfere with data collection.

4.2.2 Enforcement Challenges

This section describes enforcement challenges and concerns under Alternative 2 and the need for compliance monitoring tools. Monitoring tools described in this section are designed to ensure an observer has access to all catch, including halibut sorted on deck, to ensure that observer data provides a reliable estimate of all catch and bycatch species.

Under Alternative 2, the enforcement challenges would be similar to those described in Section 4.1.2 for EFP fishing under the status quo. These challenges are likely to result in an increase in the number of compliance complaints related to observer harassment and intimidation, sample bias, reasonable assistance, and the additional monitoring requirements related to halibut deck sorting. An increase in non-compliance may be expected with the implementation of any new monitoring program but this program in particular creates new compliance risks due to the strict reliance on observer samples as the only record of halibut PSC sorted on deck on participating vessels. This program would rely heavily on vessel personnel to assist and cooperate with the observer to accomplish necessary sampling. The monitoring requirements and sampling protocols included in this RIR have been tested under EFP fishing since 2009. Therefore non-compliance under the EFP could be indicative of fleet behavior under a regulated program. In a letter dated April 25, 2018, NMFS notified EFP participants of a departure from the terms and conditions of the EFP for exceeding the 35 minute time limit for deck sorting activity. NMFS stated that further departures from the terms and conditions of the EFP would result in the revocation of a vessel's eligibility to participate in the EFP.

This raises enforcement concerns because this program relies on observer data to provide reliable estimates of halibut PSC on these vessels. The success of this program relies heavily on vessel crew to follow specific catch handling procedures, monitoring requirements, and assist (without interfering) with observer sampling. There are numerous opportunities for industry participants to attempt to interfere with or bias observer sampling procedures under this program. As such, enforcement penalties and compliance tools are necessary to create disincentives.

Observer Data Quality

Allowing halibut to be sorted and removed from the catch on the deck of the vessel reduces the probability of halibut being in the observer sample in the factory. To accurately account for all catch and

bycatch under Alternative 2, monitoring and enforcement considerations for this program must ensure that the observer has access to all halibut sorted on the deck and that halibut only be discarded after observer sampling. The monitoring and enforcement tools identified in section 4.2.3 are designed to ensure that observer data collected under the Halibut Deck Sorting Program continues to accurately account for halibut PSC on participating vessels. This would achieve the management objectives set out in the purpose and need for this action. The data collection protocols and vessel responsibilities for handling of halibut must provide an accurate representation of the viability and total weight of the discarded halibut.

Increased Pressure on Observers

The use of the data collected during EFP fishing deviates from the status quo and is applied at the haul level, even if the data is very sparse. During deck sorted hauls, the calculated halibut DMR is unique for each haul because there can be significant deviations in the total number of halibut sorted, the size of those halibut, and the condition of those halibut. The condition of halibut encountered on deck vary significantly as a result of various factors, such as total haul duration, haul size, temperature, time out of water, and overall catch composition. The total number of halibut encountered varies greatly by many factors, such as fishery, size of haul, size of halibut, haul speed, time of day, fishing depth, and crew efforts to remove as many halibut as possible during deck sorting. As a result, there is high variability between hauls and therefore extrapolations of halibut estimates from one haul to another is limited. While the amount of halibut caught and sorted on deck will vary from haul to haul, the observer must collect their data in the same way, regardless of the number of halibut. Because the data collection protocols are standardized, there is a maximum number of halibut that an observer can measure, assess, and discard for each haul in the time allowed, regardless of how many halibut the crew could potentially remove. Therefore, the Halibut Deck Sorting Program creates a unique situation where the observer's availability and ability to collect the data for a haul could limit the vessel's operations because deck sorting can only occur if the observer is available and able to collect the necessary data.

In addition to the issues associated with the collection of composition data, removing catch prior to weighing changes how total haul size is measured. Accurate haul estimates are critical, as the total haul size is the foundation of the estimation of catch and bycatch. Under the status quo without EFP fishing, trawl CPs are required to weigh all catch on a flow scale to determine a total haul size. This would change under the Halibut Deck Sorting Program. During deck sorting, halibut would be removed from the catch before they are weighed on the flow scale. In order to determine the total haul size, the total weight of deck sorted halibut have to be added to the weight of remaining catch that is measured by the flow scale. If the lengths collected from the halibut are lost or deemed unusable, no other method exists to obtain a total weight of the haul. This increases the pressure on the observers as the vessel's ability to complete deck sorting is limited by the observer's ability to be available to complete sampling on deck.

Enforcement is concerned that these behaviors may continue or increase under a regulated deck sorting program because of the additional sampling duties during deck sorting present an additional opportunity for vessel crew to directly interfere with and bias observer sampling. Actions by vessel crew such as pressuring an observer to sample faster or interfering with deck sorting sampling would have a direct impact on the estimates of halibut PSC resulting in a direct benefit to that vessel. This program also introduces additional responsibilities for vessel crew to assist an observer which could result in additional conflict if there are differences in sampling speed or data collections that may result in slower deck sorting operations. These types of conflicts can escalate and potentially create intimidating or hostile work environments. These concerns increase the need for strong monitoring and enforcement tools to minimize the potential for non-compliance with catch handling requirements and minimize the potential impacts on an observer's work environment.

4.2.3 Monitoring and Enforcement Tools

The deck sorting program will impact three of the NMFS Office of Law Enforcement's (OLE's) highest priority areas including observer data quality, halibut PSC management, observer work environments, and observer safety.[28]

Given these priorities and the challenges detailed in the previous section, NMFS is proposing the following monitoring and enforcement tools.

Observer Coverage

Each vessel participating in the deck sorting program would be required to have at least two observers on board during deck sorting trips to collect required data and conduct required sampling during all hauls. A vessel operator may elect to carry up to four observers to allow fish to be run over the flow scale while sorting of halibut occurs on deck.

If carrying two observers, the vessel would not be allowed to run fish over the flow scale while the observer is on deck during deck sorting or while catch is loose on deck. Each observer's workload, including both deck sorting duties and normal duties, would continue to be limited by the observer workload restriction at 50 CFR 679.51(a)(2)(iii) and may not exceed 12 consecutive hours in a 24-hour period.

In addition to the general haul notification requirement at § 679.51(e)(1)(vi), the vessel would be required to notify the on duty observer at least 15 minutes prior that the crew would be conducting deck sorting on the haul.

If a vessel chooses to carry three observers, the vessel may designate a 12-hour period when the vessel intends to deck sort while also running fish over the flow scale. The vessel would notify the observers of this timeframe and the observers would determine a work schedule (each shift not to exceed 12 consecutive hours in a 24-hour period) to ensure that two observers are on duty during the designated period. If two observers are not on duty, the vessel would not be allowed to run fish over the flow scale while deck sorting is occurring on deck. During the 12-hour period designated by the vessel to allow simultaneous deck sorting and running fish over the flow scale, the vessel would be required to notify both observers at least 15 minutes prior to deck sorting.

A vessel may choose to carry four observers to allow simultaneous deck sorting and running fish over the flow scale for all hauls where deck sorting occurs. The vessel must notify both observers on duty at least 15 minutes prior to deck sorting activity. Having two observers on duty simultaneously will allow data collection activities to occur as described in the Observer Sampling Manual. Each observer's workload, including both deck sorting duties and normal duties, may not exceed 12 consecutive hours in a 24-hour period.

Most vessels that would be subject to this action are already required to carry two observers. However, CPs that choose to opt out of the Rockfish Program and Amendment 80 CPs fishing under sideboards in the GOA are currently required to carry only one observer. This action would increase the observer coverage requirement for these vessels to at least two observers. These vessels may also choose to carry additional observers (up to four total).

These provisions are necessary to mitigate the impact of deck sorting on an observer's workload. Observers would face these challenges on a haul-by-haul basis and vessels could overwhelm an observer to reduce the accuracy of the observer's estimates and reduce the amount of halibut that accrues toward

[28] Office of Law Enforcement Priorities Fiscal Years 2018–2022
https://www.fisheries.noaa.gov/webdam/download/67304003

their PSC limit. Vessel crew would be required to provide observers with adequate coordination and reasonable assistance to assist the observer to complete sampling duties as necessary.

Pre-cruise Meeting

Vessels operating in the Rockfish Program and Amendment 80 fisheries are already subject to pre-cruise meeting notification requirements and, if notified to do so by NMFS, are required to participate in a pre-cruise meeting with the assigned observers. In recent years, pre-cruise meetings have not been conducted regularly because most observers are familiar with the operational requirements for these vessels and no changes have occurred to observer sampling duties of which the vessel operators would need to be informed.

Under Alternative 2, the frequency that the Observer Program would require pre-cruise meetings would likely increase, at least in the first year of implementation. This meeting would be used to ensure that observers deployed on a vessel participating in the deck sorting program are adequately prepared to sample as prescribed in the Observer Sampling Manual. A pre-cruise meeting is also an opportunity for observers who will be collecting halibut deck sorting data for the first time on a vessel to ask questions, clarify duties, and understand vessel operations. A pre-cruise meeting would be an opportunity to discuss compliance with deck safety plans (described below) and reasonable assistance necessary to allow an observer to sample prior to departing on a trip. A pre-cruise meeting may also be required to familiarize observers and vessel crew when experimental equipment, such as chute cameras, are to be deployed aboard the vessel.

There is no minimum or maximum time requirement for how long a pre-cruise meeting must be. Typically, meetings can be as short as 30 minutes to an hour or as long as a couple hours if there are specific sampling challenges to discuss or a high level of interest from vessel personnel. The intent is to allow observers to meet key vessel crew, discuss vessel operations, and talk through sample locations, as well as allow observers to get answers to sampling questions from NMFS staff before the start of the fishing trip.

Regulations would be modified to require any vessel that will participate in the deck sorting program to notify the Observer Program when they will be carrying an observer who has not deployed on that vessel in the past 12 months. In the BSAI, this would mean that pre-cruise meeting notification requirements would be added for vessels that are fishing groundfish in TLAS fisheries and are not subject to Amendment 80 regulations. This notification would allow NMFS to determine if a pre-cruise meeting is necessary and for NMFS to contact the vessel to arrange for a pre-cruise meeting.

NMFS would require a pre-cruise meeting as needed to adequately prepare an observer who may be deploying on a vessel for the first time that will be conducting deck sorting activity or as needed to resolve ongoing sampling challenges on a particular vessel. Pre-cruise meetings would be scheduled during a vessel's time in port. The increased use of pre-cruise meetings under the deck sorting program would increase the need to have Observer Program staff participate in pre-cruise meetings and could increase the demands on Observer Program field office staff resources.

Motion Compensating At-Sea Flow Scale and Observer Sampling Stations

As discussed in Section 5.1.2 flow scales are required to allow all catch to be weighed. Because observer samples are extrapolated to the entire haul, catch from each haul is weighed separately on the scale. To facilitate separate weighing, catch from each haul cannot be mixed with other hauls. Under Alternative 2, deck sorting participants must use the motion compensated flow scale to weigh all catch, except halibut sorted on deck.

Video Monitoring

Vessels that opt to participate in the deck sorting program would be required to provide video monitoring of the deck and all areas where fish could be removed from the catch or discarded from the vessel to ensure that no fish are discarded until the observer has collected data from halibut sorted from the catch and that only halibut are discarded. The system would be operating at all times when the vessel is fishing during a deck sorting trip. If the deck video monitoring system failed, the vessel operator would be prohibited from deck sorting until the system was repaired. The vessel operator would be required to notify NMFS when the video monitoring system failed. The system would be required to meet specifications at § 679.28(e).

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.

Video monitoring of the deck and all areas where fish may be removed from the catch or discarded by the crew will allow NMFS OLE to verify the vessel is in compliance with the deck sorting program requirements. With video, NMFS OLE may be able to verify reports from observers regarding challenges encountered with observer sampling.

All CPs and motherships required to use a flow scale already have video monitoring systems. Vessels subject to Amendment 80 sideboards in the GOA, as well as those vessels that opt out of the Rockfish Program, are not required to use a flow scale and are not required to operate the video monitoring systems while participating in those fisheries, but all these vessels participate in other fisheries that do require video monitoring systems. Vessels that have participated in the EFP fishing under the status quo have already installed cameras on deck for this purpose. Vessels that have not participated in the EFP in the past would need to install additional cameras on deck and may need additional hard drive storage to accommodate the additional video data.

Video monitoring systems for the deck sorting program would be required to be inspected and approved by NMFS staff annually. Ten business days' notice would be required for the inspection. These inspections would generally coincide with other annual video monitoring inspections. Any alterations to the video monitoring systems for the deck sorting program would require additional inspection and approval before continuing to deck sort. The addition of deck cameras may increase the length of time for the inspection, as well as the time for vessel personnel to prepare for the inspection.

Deck Sampling Station

To participate in the deck sorting program, a vessel owner would be required to provide space on deck and a table for the observer to use to collect data on deck sorted halibut. The table would be required to meet the following specifications, unless otherwise approved by NMFS:

- be between 0.9 and 1.1 meters tall with a surface that is at least 0.6 meters deep and 1.2 meters wide and the entire surface must be available for use by the observer;
- have a barrier on at least two sides to prevent fish from sliding off;
- have a NMFS-approved length measuring device; and
- have a single pathway leading up to the table via a ramp, chute, or belt where halibut are slid from the deck and off the vessel.

This deck sampling station would be required to be designed in such a way that reduces exposure to hazards on deck such as moving net reels, winches, and other large moving parts. Efforts and procedures to minimize hazards in the deck sampling station must be detailed in the deck safety plan described below. The deck sampling station would be required to have adequate space for an observer to complete data collection duties in a safe location.

Vessels that are participating in 2018-19 EFP fishing already have installed a sampling table that meets the above requirements. Additionally, all vessels that participate in the EFP are required to convey all halibut to the deck sampling station via a single pathway. A vessel that had not participated in EFP fishing would be required to install a table on deck and establish a safe space for the deck sampling station.

Deck sampling stations would be required to be inspected and approved annually by NMFS staff. Ten business days' notice would be required for the inspection. These inspections would be done by Observer Program staff and would generally coincide with the annual observer sampling station and bin monitoring inspections. Any alterations to the deck sampling station would require additional inspection and approval before participating in the deck sorting program.

Catch Handling and Observer Sampling

A vessel operator would be required to comply with catch handling requirements designed to ensure the observer has access to all sorted halibut and to ensure that all other catch is transferred into the fish bins and weighed and sampled in the factory to provide reliable estimates of catch and bycatch for each vessel. These catch handling practices are designed to ensure that observers can collect unbiased samples. Catch handling requirements could include the following:

Observer Present on Deck
Deck sorting activity would not be allowed without the observer present on deck. For a haul that will be sorted on deck, the catch would be required to stay inside the codend on the deck and may not be removed from the codend for the purpose of deck sorting until the observer is present.

Single pathway
Halibut removed from the catch would be required to be handled carefully to minimize injury prior to discard and provided to the observer at the deck sampling station for data collection through a single pathway. The single pathway from catch to discard will ensure the observer has access to all halibut removed from the catch during deck sorting activity. All halibut sorted on deck would be required to be discarded at a single point of discard after the observer work table.

All halibut sorted on deck would be required to pass over the observer work table in the observer sampling station with the exception of very large halibut that would be too cumbersome to place on the work table for data collection. The observer must be provided access to these very large halibut prior to discard, and this process would be described in the deck safety plan.

Time Limit
Deck sorting activities would be limited to a specific number of minutes after the codend is opened. After this time limit, all remaining catch – including those halibut which were removed during deck sorting activities but which the observer did not have time to measure, assess, and discard – would be required to be transferred into the fish bins in the presence of an observer leaving no loose fish on deck. Halibut deck sorting activity would be limited by a time limit stated by NMFS in the annual deck sampling station inspection approval report. As stated in Section 1.3.5, halibut viability decreases after 20 to 25 minutes out of water. To allow for annual flexibility and the incorporation of additional scientific information to inform the optimal amount of time for halibut deck sorting, this time limit would not be stated in regulations which are costly and time consuming to change.

Reasonable Assistance to the Observer
During the deck sorting activities, the vessel crew sorting halibut on deck would be required to provide reasonable assistance to the observer without interfering with data collection duties. This could include adjusting the pace that halibut are given to the observer to allow the observer to complete all sampling duties as described in the Observer Sampling Manual.

Signal in Factory of Deck Sorting

During deck sorting activities, catch would not be allowed to flow over the flow scale and be sorted without the vessel carrying an additional observer to ensure all sampling duties could be completed as stated in the Observer Sampling Manual. A vessel operator would be required to devise a visual signal to communicate when catch may not to be run over the flow scale during deck sorting activity. This is necessary to ensure the observer has access to unsorted catch to complete sampling in the factory and on deck.

These catch handling requirements are designed to ensure that only halibut are removed from the catch prior to weighing and that an observer has access to all halibut removed from the catch during deck sorting. These protocols ensure the observer can collect unbiased samples and facilitate accurate catch and bycatch estimates.

These catch handling requirements are similar to those required in the 2018-19 EFP, but have been modified to address associated enforcement challenges.

Deck Safety Plan

Under Alternative 2, vessel operators must submit a deck safety plan for review and approval by NMFS annually before participating in the deck sorting program. When deck sorting, vessel crew and the observer will spend more time on the deck of the vessel, which could increase exposure to safety hazards, such as falling overboard or moving equipment. Deck sorting also requires additional crew to enter the trawl alley to sort and handle halibut. Vessels would also be required to provide safe observer access to the deck and sampling station.

A deck safety plan would describe how the observer may access and transit the deck safely to access their deck sampling station. The deck safety plan would also include notations of potential hazards during the transit, communication procedures that must be followed by vessel crew and observers during deck operations, descriptions of hazards that could be encountered in the deck sampling station, procedures to be followed by both the vessel crew and the observer to mitigate potential safety hazards, and procedures to address halibut too large for the sample table and discard path. These deck safety plans would include diagrams showing the access path to the deck sampling station noting any potential hazards.

The vessel captain would be required to review the deck safety plan with each new observer and provide each observer a copy of the deck safety plan prior to departure on a trip when deck sorting would occur. This deck sorting safety meeting would be required any time the observers, the vessel operator, or key crew members designated by the captain change. Key crew members would be designated by the captain and would include the crew members involved in deck during deck sorting activities that notify the observer, provide reasonable assistance to the observer during deck sorting, and the crew member in the factory that would stop the sorting in the factory, as well as any other crew members the captains finds necessary. The purpose of a deck safety meeting is to ensure that all parties involved in activities related to halibut deck sorting are informed of the safety and communication procedures for the vessel. Deck safety meetings replace the pre-trip meetings used in the EFPs. The name change is to avoid confusion with the requirements for pre-cruise meetings.

Deck safety plans would be created by vessel personnel and submitted to NMFS for review annually. Each deck safety plan would need to be inspected by NMFS staff, and the vessel operator would schedule the inspection with at least 10 business days' notice. These inspections would be done by Observer Program staff and would generally coincide with the annual observer sampling station inspections. Any alterations to the deck safety plans would require additional inspection and approval.

Each vessel that plans to participate in the deck sorting program during the year would be required to have a NMFS-approved deck safety plan prior to embarking on a trip when deck sorting activity will occur. Review and approval of a deck safety plan would require at least 10 business days from the time it

is submitted to NMFS. A vessel owner or operator would need to develop the plan and allow for the review time prior to departure on a deck sorting trip.

Deck safety plans were implemented and approved for the all 2018-19 EFP participating vessels. Any vessels that had not participated in the 2018-19 EFP would need to create a deck safety plan and have it approved.

Reporting Requirements

Each vessel participating in the deck sorting program would be required to submit additional information to NMFS.

Vessel operators would report which hauls are deck sorted in the electronic logbook. A new field has been added to the electronic logbook for this purpose. This enables NMFS OLE to determine which vessel catch handling requirements apply, and NMFS to correctly apply the catch accounting programming to separate the halibut that were sorted on deck from the halibut encountered in the factory and apply the appropriate DMR to each group of halibut. If this field is not correctly completed, the inappropriate catch accounting methods might be applied and the vessel could receive the same factory DMR for both deck sorted and factory encountered halibut.

Advanced technologies

Advanced technologies, such as electronic length boards; automated vision-based length measurement technology; chute cameras; or on deck scales to increase the amount of data collected, improve accuracy, and reduce the time required for observers to collect data could speed up the return of halibut back to the sea and improve viability as well as reduce the time crew and observers are required to be on deck. At this time, these technologies are still in the research and development phase. If Alternative 2 is selected, any of these advanced technologies could be implemented in the future once adequate testing for accuracy and reliability has been conducted.

4.2.4 Halibut Mortality

The cumulative halibut mortality that accrues to a particular halibut PSC limit is the product of a DMR multiplied by the estimated halibut PSC. DMRs are estimated using the best information available in conjunction with the annual BSAI SAFE report. NMFS revised methods for estimating DMRs, as discussed in Section 1.3.2; Table 2 shows the halibut DMRs for the BSAI for 2016 through 2018 and Table 3 shows the halibut DMRs for the GOA for 2016 through 2018.

When halibut deck sorting occurs on a non-pollock trawl CP, there are two components of the total halibut PSC in the CAS: 1) the weight and mortality of halibut sorted on deck; and 2) the weight and mortality of halibut in the factory. The sum of the two estimates — halibut mortality from the deck sorted fish plus the mortality of fish from the factory —– is posted in the CAS. See Section 1.3.6 for additional information on halibut PSC mortality calculations.

Net savings in halibut mortality, similar to those seen under the deck sorting EFPs, are expected under Alternative 2. See Section 1.3.5 for more information.

Whale Interactions

Under Alternative 2, whale interactions are expected to be similar to those reported during EFP fishing. During EFP fishing, feeding on discarded halibut was observed, but it is not possible to accurately quantify the impact on halibut mortality at this time. Even though whale depredation may be an issue for some vessels some of the time, a specific way to address this issue in regulations is not clear at this time. See Section 4.1.4 for additional information about whale interactions during EFP fishing.

4.2.5 Safety

The impacts of the regulated deck sorting program would be similar to the impacts of the EFP under the status quo, but could be increased for vessels that may participate in the regulated deck sorting program and have not participated in the EFP. By limiting the maximum amount of time spent on deck sorting halibut, the risk of injury or falls overboard for observers and crew will be minimized. A deck safety meeting and deck safety plans would be required under Alternative 2 as they are under the EFP.

4.2.6 Costs

Operational Costs

Under Alternative 2, the costs of participating in the Halibut Deck Sorting Program would be very similar to the cost of participating in the EFP which are detailed in Section 4.1.6 under the status quo. For vessels that have not previously participated in the EFP, participation in the Halibut Deck Sorting Program could require significant changes to how catch is handled on board, including potentially costly deck modifications, development of deck safety plans, and potentially slower processing. Due to differences in vessel configurations, it may be more costly or less feasible for some vessels to adapt to the equipment and monitoring requirements. Severe weather conditions, such as high seas, heavy icing, and extreme winds may also make deck sorting unsafe at certain times of the year. Finally, halibut deck sorting may not be beneficial for vessel operators in fisheries where halibut bycatch is very low and the costs of deck sorting outweigh the benefits.

Similarly to EFP fishing under the status quo, observers would collect additional data that must be entered and transmitted to NMFS under Alternative 2. This may require the observer to use vessel equipment for longer periods of time. Some vessels have designated equipment for the observer's use that is available at all times and this additional usage would have no impact on these vessels. On vessels where this equipment is shared by the crew, this additional time necessary for the observer to enter and transmit observer data may limit the amount of time the equipment is available to vessel personnel.

Agency Costs

Under Alternative 2, the costs to the Agency would shift from EFP management to outreach, compliance assistance, and new inspection requirements to support implementation of the regulated Program. Without the addition of more Agency staff, additional time spent on inspections required under the regulated program would reduce the amount of time available for other tasks such as training, providing inseason advising, and debriefing observers.

Note that if more vessels participated under the regulated program, or if more vessels chose to take additional observers to complete the deck sorting data collection, this would also increase the Observer Program's workload for training, inseason advising, and debriefing. The Agency has already made observer training additions associated with successful implementation of the EFP, and would continue that work. It should be noted that observers aboard vessels participating in deck sorting have more halibut information, which can take more time to debrief. Therefore, overall debriefing services may take longer under Alternative 2.

Enforcement resources could also be re-directed to deal with the expected increase in compliance complaints related to the implementation of the Halibut Deck Sorting Program. The Halibut Deck Sorting Program would add three additional inspection types to the already existing inspection requirements. To efficiently use Agency staff time consolidating the various inspections into one day or visit to the vessel would limit the number of unnecessary trips to the vessel. This would also minimize the amount of time vessel crew would spend on requesting and interacting with Agency staff to receive the necessary approvals.

4.2.7 Benefits

As discussed under the benefit of the status quo with FFP halibut deck sorting, the primary benefit to participants in a halibut deck sorting program is reduced halibut mortality accrual against the applicable PSC limit. This benefit is realized via the estimation of reduced halibut DMRs, on a haul–by-haul basis, when halibut can be sorted from the catch on deck and observers can determine that deck sorted halibut have a higher viability than factory sorted halibut. The extent to which this benefit will accrue depends on many factors such as length of haul, time halibut spend out of the water, the volume of halibut sorted, and the overall volume of fish in the haul

The incentive for participation in halibut deck sorting is that participants may gain access to the halibut mortality savings they achieve when deck sorting halibut. Within the Amendment 80 cooperative, member companies receive annual allowances of halibut mortality that they then use to harvest their directed fishing target species. Reduction in halibut mortality via deck sorting would theoretically provide access to more fishing opportunity and would become more important if either TAC for target species were to increase or if the halibut PSC limits were further reduced. In the other potentially affected fisheries, reduced halibut mortality accruing against PSC limits provides a similar incentive to participate.

Section 4.1.4, analyzes the discard mortality of halibut within the EFP. Using CAS data, the net savings of halibut mortality as a result of the EFP were tabulated on a haul-by-haul basis. The net savings were then aggregated for all of the hauls within a range of effective DMRs and depicted in Figure 9 and Figure 10 with gray bars.

As discussed in Section 4.1.4, in 2016, the net savings of halibut mortality on EFP hauls was 267.6 mt (Table 7). This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (596.9 mt) and the EFP mortality (329.3 mt). As expected, the larger gains in halibut mortality savings occur on hauls with lower effective DMRs and taper off as mortality rates rise. A small net loss occurs in both years at the highest range of mortality rates where more dead halibut occur as a result of the EFP. This situation arises because the EFP mortality rates applied to the halibut catch are higher than the mortality rates published in the harvest specification tables. The harvest specification mortality rates would have been applied to the halibut catch if the EFP did not occur.

In 2017, the net savings of halibut mortality on EFP hauls was 620.9 mt (Table 7). This is the difference between the standard halibut mortality based on DMRs published in the harvest specifications (1,633.1 mt) and the EFP mortality (1,012.2 mt). This is more than twice the net savings in 2016. The net savings of halibut on EFP hauls exemplifies the potential benefits, in terms of reduced halibut mortality, that participants in deck sorting of halibut may achieve under this action.

A secondary benefit of reduced halibut mortality in groundfish trawl fisheries that use halibut deck sorting is that the reduced halibut mortality accrues to the halibut biomass available to other users of the resource. Reduced halibut mortality in trawl fisheries may result in more halibut being available to IFQ or CDQ halibut fishery participants as well as to subsistence, sport, and personal use harvesters. For example, in 2015, the AKSC set its target halibut mortality usage for the year substantially below its limit. This allowed the IPHC to set a higher directed fishing limit for halibut in the BSAI (Final EFP report 15-02[29]). The extent to which such secondary benefits may accrue will depend on how many vessels ultimately participate in halibut deck sorting activities and on how successfully they continue to achieve reduced halibut discard mortality accruals.

[29] Available at https://alaskafisheries.noaa.gov/fisheries/efp

4.3 Summation of the Alternatives with Respect to Net Benefit to the Nation

Overall, this action is likely to result in net benefits to the nation. This action seeks to reduce halibut bycatch mortality in the affected trawl fisheries and thereby allow fishing operations to maximize their directed harvesting opportunities within regulatory halibut PSC limits that, while not presently constraining, may become constraining in the future. Maximizing fishing opportunities will also promote achieving optimal yield in the affected fisheries. Further, reduced halibut mortality in the affected trawl fisheries will potentially provide more of the harvestable biomass of the halibut stock to halibut directed fishery participants in the hook-and-line IFQ fisheries, as well to subsistence, personal use, and sport fisheries. Participation in the halibut deck sorting program is not without cost to industry, observers, and NMFS and in some instances participation may not be economically viable for a variety of reasons; however, the program will be voluntary and will allow industry flexibility to assess economic conditions and choose whether to participate in the deck-sorting program or not. Presumably, industry will only conduct halibut deck sorting when the benefits of reduced mortality provide valuable fishing opportunity and the resulting operational cost of halibut deck sorting, measured in terms of mitigation of loss of production via increased fishing and processing time, does not exceed the benefits of halibut deck sorting.

Table 11 Summary of impacts of the alternatives.

Impact Category	Alternative 1: No Action – NOT participating in EFP fishing	Alternative 1: No Action – participating in EFP fishing	Alternative 2: Voluntary Halibut Deck Sorting
Enforcement Challenges	• Observer Harassment or Intimidation • Observer sample bias • Prohibited species mishandling	• Observer Harassment or Intimidation • Observer sample bias • Reasonable Assistance • Prohibited species mishandling	Same as fishing under EFP
Enforcement tools	• 2 + observers • Pre-cruise meetings • Catch Weighing • Observer Sampling Station • Video Monitoring • Catch Handling • Observer Notification • Reasonable Assistance Requirement • EFP permit provisions	Same as No Action plus: • Deck sampling station • Video monitoring of deck sorting • Deck Safety Plan • Pre-trip meeting • Additional Catch Handling requirements	Same as fishing under EFP
Halibut Discard Mortality Rate	• Calculated fleet-wide using observer data collected in the factory	• Allows DMR to be calculated as a vessel specific number	Same as fishing under EFP
Safety	• Limited exposure to hazards on deck	• Increased exposure to hazards on deck	Same as fishing under EFP
Costs	• Generally high halibut mortality could constrain the fishing season.	• EFP Administration (Industry & NMFS Staff) • Monitoring equipment installation, maintenance, and annual inspection process • Increased workload for on board observers	Same as fishing under EFP except reduced costs for EFP administration (Industry & NMFS Staff).
Benefits	• Familiar and established monitoring protocols	• Reduced halibut morality (benefits the trawl fleet as well as the directed halibut fleet) • Optional participation at the vessel and haul level.	Same as fishing under EFP

5 Magnuson-Stevens Act and FMP Considerations

5.1 Magnuson-Stevens Act National Standards

Below are the 10 National Standards as contained in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and a brief discussion of how each alternative is consistent with the National Standards, where applicable.

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

None of the alternatives would affect the ability of NMFS to prevent overfishing while achieving optimum yield. The proposed action evaluates implementation of monitoring and enforcement provisions to allow trawl CPs and motherships participating in the non-pollock trawl fisheries to remove halibut from the catch on deck prior to weighing in the factory to reduce halibut PSC mortality in the groundfish fisheries of the BSAI and GOA. Observer data would continue to be available to fishery managers and stock assessment authors in order to monitor and prevent overfishing. None of the alternatives would modify the methods used to establish overfishing limits, the optimum yield in the groundfish fisheries, or the amount of fishing that is allowed on annual basis. The action alternative would be expected to improve the ability of vessel owners or CDQ groups to fully harvest their allocations under existing regulations by reducing the likelihood that halibut PSC limits would be constraining.

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

Observer data would continue to be a component of the best available data for the purpose of conservation and management of this fishery. NMFS has worked with EFP applicants since 2009 to design and test the monitoring and catch handling procedures analyzed under the action alternative. Alternatives 2 would implement monitoring requirements that are designed to ensure that observer data collected on these vessels provide reliable estimates of catch and bycatch on affected vessels. The preferred alternative would maintain observer data quality and reduce the mortality of incidentally caught halibut in the non-pollock groundfish fisheries of the BSAI and GOA.

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

The changes to monitoring and enforcement requirements under the proposed action would not affect the ability of the Council and NMFS to manage individual fish stocks throughout their range, as the implementation of modified monitoring and enforcement requirements would not eliminate the availability of any source of data, and observer data would continue to be used to provide estimates for the fishing activities using established procedures.

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

The proposed action would impact most vessels equally because monitoring and enforcement requirements would be voluntary and required for all vessels that decide to participate in the program and the preferred alternative would not discriminate between residents of different states in doing so. The proposed action would not allocate or assign fishing privileges among various U.S. fishermen.

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

A purpose of the proposed action is to reduce the mortality of halibut PSC caught incidentally to the non-pollock groundfish trawl fisheries of the BSAI and GOA. This could increase the harvest of allocated species by minimizing the risk that the fishery could be closed due to halibut PSC limits. However, the proposed action would not change any fishery allocation and does not have economic allocation as its sole purpose.

National Standard 6 — Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

The monitoring and enforcement requirements included in this action are designed to reduce halibut mortality and ensure that observer data continues to provide reliable estimates of catch used for fisheries management in the non-pollock groundfish trawl fisheries in the BSAI and GOA. This action would allow for vessels to participate in the halibut deck sorting program on a voluntary basis and as appropriate on the haul and trip level. Individual vessels could make operational decisions to best suit the fishery, season, and haul (Chapter 4). Thus, this measure's regime is flexible, allowing vessels to timely respond to resource and other needs.

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

The purpose of the proposed action is to reduce halibut mortality and ensure that observer data continues to provide reliable estimates of catch and bycatch species in the affected fisheries. Participation in this program along with the associated costs would be voluntary, allowing for flexibility for individual vessel owners to determine if the benefits of reduced halibut mortality outweigh the costs of complying with the monitoring and enforcement requirements. The proposed action would not duplicate any other management action as no other monitoring program allows this activity to occur.

National Standard 8 — Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of National Standard 2, in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The proposed action does not reduce the potential for sustained participation of fishing communities in the groundfish and halibut fisheries off Alaska because the alternatives would not change fishery allocations or harvest or delivery patterns. To the extent that the affected fishery participants are members of fishing communities that are affected by the prosperity of the fishery, the proposed action considers how to minimize adverse economic impacts on fishery participants. In addition, some of the allocations being harvested by potentially affected vessel in the groundfish CDQ fisheries are made to CDQ groups who represent western Alaska communities. Overall, the proposed action is expected to have a net benefit to fishery participants because participation would be voluntary and therefore individual vessel owners and operators may make operational decisions based on specific situations. This proposed action is also expected to benefit the directed halibut fishery participants by potentially reducing the mortality of incidentally caught halibut and thereby making those fish available to the directed fishery.

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

The purpose of the proposed action is to reduce halibut mortality and ensure that observer data continues to provide reliable estimates of catch and bycatch species in the affected fisheries. The Council's fisheries research plan, as implemented by the Observer Program, provides the standardized reporting methods to assess the type and amount of bycatch occurring in the groundfish and halibut fisheries. The proposed action would modify sampling procedures and monitoring requirements but would not modify existing reporting methods.

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

NMFS has implemented regulatory protections, training requirements, and program policies that identify observer safety as the highest priority. None of the alternatives would change or compromise the underlying support system for observer safety. NMFS has identified additional safety risks associated with increased time on deck during deck sorting activities. To address these risks and NMFS's responsibility to support the health and safety of observers, a deck safety plan would be required for each vessel participating in the program. The deck safety plan would be reviewed and participating vessels inspected annually by NMFS to ensure that safety risks and mitigation strategies are communicated to each observer that may participate in halibut deck sorting activity. Together with the pre-cruise and pre-trip meetings that would be required to participate in halibut deck sorting, observers, vessel crew and NMFS would have the opportunity to discuss safety concerns and mitigation procedures under the preferred alternative.

6 Preparers and Persons Consulted

Preparers

Anne Marie Eich	NMFS AKRO Sustainable Fisheries Division (SFD)
Alicia Miller	NMFS AKRO SFD
Scott Miller	NMFS AKRO SFD
Jennifer Watson	NMFS AKRO SFD

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Alisha Falberg	NMFS General Counsel (GC), Enforcement Section
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Brian Mason	NMFS AFSC FMA
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7 References

Alaska Fisheries Science Center (AFSC). 2017. Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Islands Area: Economic Status of the Groundfish Fisheries Off Alaska, 2016. National Marine Fisheries Service, 7600 Sand Point Way N.E., Seattle Washington. Available at: https://www.afsc.noaa.gov/REFM/Docs/2017/economic.pdf

Alaska Fisheries Science Center and Alaska Regional Office. 2018. North Pacific Observer Program 2017 Annual Report. AFSC Processed Rep. 2018-02, 136 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115.

Cahalan, J., J. Mondragon, and J. Gasper. 2014. Catch Sampling and Estimation in the Federal Groundfish Fisheries off Alaska: 2015 Edition. NOAA Tech. Memo. NMFS-AFSC-286, 46 p. Available at: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM- AFSC286.pdf.

Conners, M.E., J. Cahalan, S. Gaichas, W.A. Karp, T. Loomis, and J. Watson. 2009. Sampling for estimation of catch composition in Bering Sea trawl fisheries. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-199, 77 p. Available at: https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-199.pdf

Fearnbach, H., Durban, J. W., Ellifrit, D. K., Waite, J. M., Matkin, C. O., Lunsford, C. R., ... & Wade, P. R. 2014. Spatial and social connectivity of fish-eating "Resident" killer whales (*Orcinus orca*) in the northern North Pacific. *Marine Biology* 161(2):459-472.

Forney, K. A. and Wade, P. R. 2006. Worldwide distribution and abundance of killer whales. Whales, whaling and ocean ecosystems, 145-162.

Gauvin, John. 2018, Personal Communication via email, January 11, 2018.

NMFS. 2017. 2018 Observer Sampling Manual. Fisheries Monitoring and Analysis Division, North Pacific Groundfish Observer Program. Alaska Fisheries Science Center, 7600 Sand Point Way N.E., Seattle, Washington, 98115.

NMFS. 2010. Endangered Species Act - Section 7 Consultation Biological Opinion: Authorization of groundfish fisheries under the Fishery Management Plan for groundfish of the Bering Sea and Aleutian Islands management area; Authorization of groundfish fisheries under the Fishery Management Plan for Groundfish of the Gulf of Alaska; State of Alaska parallel groundfish fisheries. NOAA/NMFS, Juneau Alaska.

NMFS. 2018. The western Alaska Community Development Quota Program. National Marine Fisheries Service, Juneau Alaska. https://alaskafisheries.noaa.gov/sites/default/files/cdq-program-summary-1018.pdf

NPFMC. 2012. Fishing fleet Profiles. North Pacific Fishery Management Council. Anchorage, Alaska. Available at: https://www.npfmc.org/wp-content/PDFdocuments/resources/FleetProfiles412.pdf

NPFMC. 2007. Secretarial Review Draft for Allocation of Non-Pollock Groundfish and Development of a Cooperative Program for the H&G Trawl Catcher Processor Sector. North Pacific Fishery Management Council. 605 W. 4th Ave. Suite 306, Anchorage, AK 99501. July 20, 2007. Available at: https://alaskafisheries.noaa.gov/sites/default/files/analyses/earirfrfa0907.pdf

NPFMC. 2017a. The Central GOA Rockfish Program Review. North Pacific Fishery Management Council. Anchorage, Alaska. Available at: (http://legistar2.granicus.com/npfmc/meetings/2017/10/965_A_North_Pacific_Council_17-10-02_Meeting_Agenda.pdf

NPFMC. 2017b Initial Review Draft Regulatory Impact Review/Environmental Assessment/Initial Regulatory Flexibility Analysis for Proposed Amendment to the Fishery Management Plan for Bering Sea/Aleutian Islands Management Area; Limiting Access for Offshore Trawl CVs in the BSAI Trawl Limited Access Yellowfin Sole Fishery. North Pacific Fishery Management Council. Anchorage, Alaska. Available under agenda item C6 at: http://legistar2.granicus.com/npfmc/meetings/2017/1/951_A_North_Pacific_Council_17-01-30_Meeting_Agenda.pdf

NPFMC. 2017c. Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea/ Aleutian Islands region. Chapter 3, Assessment of the sablefish stock in Alaska (DH Hanselman, CR Lunsford, and CJ Rodgveller). Anchorage, Alaska. December 2017. Available at: https://www.afsc.noaa.gov/REFM/Docs/2017/BSAIsablefish.pdf

Oliver, C., Gauvin, J., and Concepcion, B. 2018. Final Report on the 2017 Halibut Deck Sorting EFP. Alaska Seafood Cooperative. Available at: https://alaskafisheries.noaa.gov/sites/default/files/final_2017_ds_efp_report_2.pdf.

Peterson, M. J., Mueter, F., Hanselman, D., Lunsford, C., Matkin, C., and Fearnbach, H. 2013. Killer whale (*Orcinus orca*) depredation effects on catch rates of six groundfish species: implications for commercial longline fisheries in Alaska. *ICES Journal of Marine Science* 70(6):1220-1232.

Peterson, M. J., Mueter, Criddle. K., and Haynie, A.C. 2014. Killer Whale Depredation and Associated Costs to Alaskan Sablefish, Pacific Halibut and Greenland Turbot Longliners. *PLoS ONE* 9(2):e88906. https://doi.org/10.1371/journal.pone.0088906

Peterson, M. J. and Carothers, C. 2013. Whale interactions with Alaskan sablefish and Pacific halibut fisheries: surveying fishermen perception, changing fishing practices and mitigation. Marine Policy, 42, 315-324.Peterson, M. J., & Hanselman, D. 2017. Sablefish mortality associated with whale depredation in Alaska. *ICES Journal of Marine Science* 74(5):1382-1394.

Sigler, M. F., Lunsford, C. R., Straley, J. M. and Liddle, J. B. 2008. Sperm whale depredation of sablefish longline gear in the northeast Pacific Ocean. *Marine Mammal Science* 24:16-27. doi:10.1111/j.1748-7692.2007.00149.x

Yano, K. and Dahlheim, M. E. 1995. Behavior of killer whales Orcinus orca during longline fishery interactions in the southeastern Bering Sea and adjacent waters. *Fisheries Science* 61(4):584-589.

Appendix A. 2018 EFP

BERING SEA/ALEUTIAN ISLANDS AND GULF OF ALASKA
GROUNDFISH FISHERY
EXEMPTED FISHING PERMIT
AUTHORITY: 50 CFR 600.745(b) AND 50 CFR 679.6
PERMIT 2018-01

The Administrator, Alaska Region, (Regional Administrator), National Marine Fisheries Service (NMFS), acting on behalf of the Secretary of Commerce, hereby authorizes designated non-pelagic trawl catcher-processor vessels operating in the Bering Sea and Aleutian Islands (Amendment 80, Community Development Quota [CDQ], and Trawl Limited Access programs) and Gulf of Alaska to conduct experimental fishing that will provide information on how modified halibut handling practices may contribute to incidentally caught halibut survival. The exempted fishing permit (EFP) describes exemptions to regulations and other requirements that are necessary to facilitate the project.

The permit holders and the owner(s) and operator(s) of the participating vessel(s) must comply with the EFP terms, and unless otherwise provided in this permit, the Magnuson-Stevens Fishery Conservation and Management Act, and 50 CFR parts 600 and 679. An authorized designated representative for each vessel participating in experimental fishing under this EFP must complete and sign a copy of the vessel information form contained in Appendix A, of this EFP.

This permit is valid and effective when signed by both the Regional Administrator and all participating permit holders. This permit is valid through December 31, 2019. If experimental fishing concludes before the expiration date, the Principal Investigator may terminate the permit prior to the expiration date by notifying Brandee Gerke (907) 586-7650, NMFS Alaska Regional Office. This permit may be revoked, modified, or suspended under the permit's terms, by the Regional Administrator, or by regulatory action under 50 CFR part 679, 50 CFR 600.745, or 15 CFR part 904.

James W. Balsiger, Ph.D.
Administrator,
Alaska Region, NMFS

12/20/17
Date Signed

John Gauvin
Principal Investigator,
Alaska Seafood Cooperative

12/19/2017
Date Signed

1

BERING SEA/ALEUTIAN ISLANDS
GROUNDFISH FISHERY
MODIFIED EXEMPTED FISHING PERMIT 2018-01
PERMIT HOLDER SIGNATURE PAGE

Todd M. Loomis
Permit Holder Signature

Todd M. Loomis
Permit Holder Printed Name

Ocean Peace, Inc.
Permit Holder Company/Affiliation

12-15-2017
Date Signed

Permit Holder Signature

ANNIKA SALTMAN
Permit Holder Printed Name

FISHERMEN'S FINEST, INC
Permit Holder Company/Affiliation

12/15/2017
Date Signed

Jan Jacobs
Permit Holder Signature

Jan Jacobs
Permit Holder Printed Name

American Seafoods Co.
Permit Holder Company/Affiliation

12/15/17
Date Signed

Keith A Bruton
Permit Holder Signature

KEITH A BRUTON
Permit Holder Printed Name

O'HARA CORPORATION
Permit Holder Company/Affiliation

12/16/17
Date Signed

Permit Holder Signature

Mark Fina
Permit Holder Printed Name

United States Seafoods, LLC
Permit Holder Company/Affiliation

12/14/17
Date Signed

Permit Holder Signature

Erik C. Petersen
Permit Holder Printed Name

IQUIQUE US., LLC
Permit Holder Company/Affiliation

12/16/17
Date Signed

Permit Holder Signature

James Johnson

Permit Holder Printed Name

Glacier Fish Company

Permit Holder Company/Affiliation

12/18/17

Date Signed

Permit Holder Signature

Permit Holder Printed Name

Permit Holder Company/Affiliation

Date Signed

Permit Holder Signature

Permit Holder Printed Name

Permit Holder Company/Affiliation

Date Signed

BERING SEA/ALEUTIAN ISLANDS
GROUNDFISH FISHERY
MODIFIED EXEMPTED FISHING PERMIT 2018-01
TERMS AND CONDITIONS

AUTHORITY: 50 CFR 600.745(B) AND 50 CFR 679.6

MODIFIED HALIBUT HANDLING EXPERIMENT FOR THE BERING SEA NON-PELAGIC TRAWL CATCHER-PROCESSOR FISHERIES

A. Permit Holders – The following individuals and the companies they represent are co-applicants for this EFP and are considered co-permit holders. Each permit holder must designate an authorized representative(s) to act as the main point of contact between the permit holder, the Principal Investigator, the vessel and crew, and NMFS.

1. John Gauvin
   Alaska Seafood Cooperative (AKSC)
   4241 21st Avenue W., Suite 302
   Seattle, WA 98199
   (206) 462-7682

2. Mark Fina
   United States Seafoods, LLC (USS)
   1801 Fairview Ave. E., #100
   Seattle, WA 98102
   (206) 763-3133
   Vessels: Seafreeze Alaska, Seafreeze America, Legacy, Vaerdal

3. Todd Loomis
   Ocean Peace, Inc. (OP)
   4201 21st Ave. West
   Seattle, WA 98199
   (206) 282-6100
   Vessels: Seafisher, Ocean Peace, Alaska Warrior, Alaska Victory

4. Jan Jacobs
   American Seafoods Company, LLC (ASC)
   2025 1st Ave., #900
   Seattle, WA 98121
   (206) 448-0300
   Vessels: Katie Ann, Northern Jaeger

5. Jim Johnson
   Glacier Fish Company, LLC (GFC)
   2320 W. Commodore Way, #200
   Seattle, WA 98199
   (206) 298-1200
   Vessel: Northern Glacier

6. Annika Saltman
   Fishermen's Finest (FF)
   570 Kirkland Way
   Kirkland, WA 98033
   (206) 283-1137
   Vessels: US Intrepid, American No. 1, America's Finest

7. Keith Bruton
   O'Hara Corp. (OC)
   4315 11th Ave NW
   Seattle, WA 98107
   (206) 706-4166
   Vessels: Defender, Constellation, Enterprise, Araho, Alaska Spirit

8. Erik Petersen
   Iquique US, LLC (IUS)
   2320 West Commodore Way, Suite 200
   Seattle, WA 98199
   (206) 298-1200
   Vessels: Unimak, Cape Horn, Rebecca Irene, Arica, Northstar

B. Principal Investigator and Designated Representatives. The Principal Investigator is authorized to receive data from observers and vessel crew participating in this EFP. Each permit holder must identify a designated representative for his or her participating vessels. The permit holder may be the same person as the designated representative. The designated representatives are authorized to act on the behalf of the Principal Investigator and permit holders to receive information or data generated from the EFP from the vessel operator of any vessel authorized to participate in this EFP.

1. Principal Investigator: The Principal Investigator (PI) is, in addition to any other responsibilities described in this permit, responsible for ensuring that the designated representatives understand and comply with the provisions of this EFP. The PI is also responsible for compiling and analyzing all EFP data collected according to the provisions of this permit and presenting a summary of those data to NMFS.
   John Gauvin
   Alaska Seafood Cooperative (AKSC)
   4241 21st Avenue W., Suite 302
   Seattle, WA 98199
   (206) 462-7682

2. Designated Representatives: A designated representative, in addition to any other responsibilities described in this permit, manages the daily operations of a vessel or group of vessels and is the main point of contact for the vessel, PI, and NMFS.

a. Beth Concepcion, AKSC
(206) 462-7683
b. William McGill, OC
(425) 738-5200
c. Mark Fina, USS
(206) 763-3133
d. Todd Loomis, OP
(907) 644-8601
e. Jan Jacobs, ASC
(206) 448-0300
f. Jim Johnson, GFC
(206) 298-1200
g. Annika Saltman, FF
(206) 283-1137
h. Keith Bruton, OC
(206) 706-4166
i. Erik Petersen, IUS
(206) 298-1200
j. Christopher Oliver, AKSC
(206) 462-7682

Permitted Vessels. Designated non-pelagic trawl catcher-processor vessels in the Bering Sea and Aleutian Islands (BSAI) Amendment 80, CDQ, and Trawl Limited Access programs and designated vessels operating as non-pelagic trawl catcher-processors in the Gulf of Alaska (GOA) are authorized to fish under this EFP. Each vessel must have sufficient space on deck to sort and handle halibut and adequate space and facilities for the additional observer(s), project field manager, or other staff required for this EFP.

1. The PI will submit to NMFS a completed and signed Vessel Data Sheet (see **Appendix A**) for each participating vessel that includes the following information:
    a. Vessel name(s)
    b. Vessel length and tonnage (gross)
    c. Federal permit number and USCG registration number
    d. Vessel homeport
    e. Name, address, telephone number, and fax number of owner
    f. Name of managing company
    g. Name of designated representative
    h. Contact information for designated representative
    i. Signature of designated representative

2. A copy of this EFP must be on board each participating vessel when EFP fishing.

C. Timing of Fishing under the EFP. Fishing under the terms of this permit is authorized from the date of issuance through December 31, 2019, or until exempted fishing is concluded, whichever is earlier.

D. Exempted Fishing Areas. Exempted fishing under this permit is restricted to the BSAI and GOA.

E. Requirements for Participating Vessels. In addition to other applicable requirements, owners and operators of a vessel participating in the project must comply with the following provisions:

1. A vessel satisfying all of the following criteria may participate in this EFP:

    a. it is a member of the BSAI non-pelagic trawl catcher-processor fisheries (Amendment 80, CDQ, or Trawl Limited Access) or it is operating as a non-pelagic trawl catcher-processor in the GOA;

b. it is named on a Vessel Data Sheet (Appendix A) submitted to NMFS by the permit holder; and

c. it is approved by NMFS for fishing under the EFP.

2. Each vessel must maintain sufficient space on deck to conduct halibut sorting and handling activities and adequate space and facilities for the additional observer(s), designated representative, or other staff required for this EFP.

3. A copy of this EFP must be kept on board the vessel and made available to the observer at the observer's request.

4. Owners and operators of vessels selected for EFP fishing must operate the vessel and maintain collected experiment data in accordance with the requirements of the EFP, as described in this permit. Vessel owners and operators must follow any sampling or handling protocol adjustments deemed necessary by the PI, in consultation with NMFS.

5. Vessels participating in this EFP and operating as a non-pelagic trawl catcher/processor in the GOA must comply with the catch monitoring requirements for Amendment 80 vessels at § 679.93 (c).[1]

F. Pre-Trip Duties

1. Notification to NMFS to opt-in to EFP.

a. The vessel's designated representative must notify via email, Brian Mason (brian.mason@noaa.gov) and Marlon Concepcion (marlon.concepcion@noaa.gov) of the NMFS Fisheries Monitoring and Analysis Division (FMA) and Jennifer Watson (jennifer.watson@noaa.gov) of the NMFS Alaska Regional Office, at least 7 business days prior to a vessel beginning its first trip fishing under the EFP. The vessel's designated representative must also notify either the PI, Beth Concepcion, or Christopher Oliver (contact information provided in section B) when opting-in to the EFP.

b. As explained in section J, this EFP allows deck sorting of halibut on trips designated as EFP trips when the conditions of this EFP are met. Section J also notes that all hauls are designated as "deck sorting" hauls during an EFP fishing trip. If a vessel has previously opted-in to EFP fishing for one or more trips and subsequently discontinues EFP fishing for one or more trips, a designated representative must notify FMA prior to that vessel leaving on a subsequent EFP trip(s). This notice will include the name and Federal permit number of each vessel.

2. Notification to observer provider. To allow adequate time to secure observer(s) for deployment, the permit holder or their designated representative must inform their observer provider of the vessel's observer coverage needs at least 7 days prior to the start of an EFP trip when the number of observers will change relative to the vessel's most recent trip.

3. Pre-trip meeting with vessel.

a. A pre-EFP trip meeting is conducted prior to any EFP fishing trip when any one of the following—observer, vessel captain, or key crew member—is participating in deck sorting for the first time. The observers, captain, and key crew members will participate in the

[1] For all participating vessels in this EFP, the pre-cruise meeting in paragraph F4 of this permit replaces the pre-cruise meeting requirement at § 679.93(c)(7).

meeting and discuss EFP fishing protocols and responsibilities of each party to ensure adherence to the terms of this permit and applicable regulations.

b. The pre-EFP trip meeting may occur on the vessel at any time prior to fishing.

4. Observer pre-cruise meeting. Observer pre-cruise meetings are separate from the pre-trip meeting with the vessel described in paragraph F3 above and have a different purpose. The vessel operator or their designated representative must notify NMFS by calling the NMFS Dutch Harbor office (907-581-2060) or Kodiak office (907-481-1770) at least 24 hours prior to departure on a trip when the vessel will be carrying an observer who has not previously been deployed on that vessel within the last 12 months. Subsequent to the vessel's departure notification, but prior to departure, NMFS may contact the vessel to arrange for a pre-cruise meeting that will be conducted by NMFS. The pre-cruise meeting must minimally include the vessel operator or manager and any observers assigned to the vessel.

G. Observer Requirements for EFP Participants. All sampling under this EFP will be conducted by NMFS-certified observers deployed pursuant to regulatory requirements and working under the direction of NMFS.

1. Number of observer(s) for EFP trips. Each vessel participating in the EFP must have at least two NMFS-certified observers on board during EFP trips to collect required data and conduct required sampling during all hauls. A vessel operator may elect to carry additional observers during EFP trips, to a maximum of four observers, to allow fish to be run over the flow scale and into the factory during deck sorting (see Section K of this permit). Each observer's workload, including both EFP duties and normal duties, may not exceed 12 consecutive hours in a 24-hour period.

2. Observer Shift Schedules.

   a. Vessels carrying two observers: Each observer will work a full 12-hour shift during a 24-hour period. The observers will coordinate with each other to develop a schedule that ensures that the workload is divided equitably between each observer. Observers will conduct sampling activities throughout each haul. The lead observer will provide the vessel captain with each observer's on-duty schedule, and any changes to that schedule during the trip. This schedule will allow the captain to identify the on-duty observer for purposes of the EFP haul-back and factory notification requirements.

   b. Vessels carrying three observers: Each observer will work a full 12-hour shift during a 24-hour period. Prior to the start of each trip, the vessel will identify a 12-hour period where the vessel intends to continue to run fish over the flow scale during deck sorting operations. During this 12- hour period, two observers will be available at all times to facilitate deck and factory sampling. The observers will coordinate among themselves and with the vessel captain to develop a schedule. The schedule will ensure that the workload is divided equitably between each observer. Observers will conduct sampling activities throughout each haul. The lead observer will provide the vessel captain with each observer's on-duty schedule. Changes to the 12-hour period identified by the vessel may be made prior to starting a new trip following an offload. During a trip, should the vessel want to change the 12-hour period where two observers are needed, the change must be approved by the FMA in consultation with the observers, the AKSC, and vessel representatives. If an observer is unable to perform duties such that two observers are not available to maintain both deck and factory sampling duties, the vessel must stop the flow of fish over the flow scale during deck sorting operations so

that the remaining observer on duty can complete the deck sorting data collections.

c. Vessels carrying four observers. Each observer will work a 12-hour shift during a 24-hour period. Two observers are expected to be on duty at all times in a 24-hour period to facilitate deck and factory sampling. The observers will coordinate among themselves and with the vessel captain to develop a schedule. The schedule will ensure that the workload is divided equitably between each observer. Observers will conduct sampling activities throughout each haul. The lead observer will provide the vessel captain with each observer's on-duty schedule at the beginning of the trip. If an observer is unable to perform duties such that two observers are not available to maintain both deck and factory sampling duties, the vessel must stop the flow of fish over the flow scale during deck sorting operations so that the remaining observer on duty can complete the deck sorting data collections.

3. Employment of observers. Observers must be employed by a NMFS-approved observer service provider.

4. Working conditions. Provisions at 50 CFR 679.7(g) pertaining to observer working conditions are applicable.

H. Deck Sorting Video Monitoring. A video recording system will be installed by vessel owners or operators on each participating vessel. Video recording system requirements must meet the requirements described below:

1. A screenshot of the proposed view for each video camera installed on the participating vessel and a diagram showing all cameras and their views must be submitted to NMFS for approval 10 working-days prior to the vessel's first EFP trip.

2. The video system must be approved and operational prior to the vessel's first EFP trip.

3. The video system must be maintained by the vessel operator, and must be recording at all times during all EFP trips from the commencement of the first EFP fishing until EFP fishing is completed on the last trip conducted under this EFP.

4. The video system must record at a minimum of 5 unique frames per second, and the video stream must be viewable on a monitor, which can be placed anywhere on the boat that is accessible to viewing by a NMFS employee or any individual authorized by NMFS, to verify its functionality.

5. Video data must be reviewed by the vessel operator once per calendar day on EFP trips to verify camera placement, camera view (must be clear and unobstructed), and the system's ability to record and save the video data. Daily reviews of the video monitoring system must be recorded by the vessel operator in a log and submitted with the video to NMFS as described in paragraph H8 below.

6. In the event of a video monitoring system malfunction, the time, date, and description of the malfunction must be recorded in the video log. The video monitoring system must be repaired and operational before the vessel may begin a new trip under the EFP.

7. NMFS employees and authorized officers will be provided access to the video data any time during the vessel's participation in the EFP.

8. The video data and log must be maintained on board the vessel for the duration of a vessel's participation in the EFP and must be submitted by the designated representative to NMFS for review at the end of each vessel's participation in the EFP. Any software needed to review this

video must also be submitted to NMFS. The address to submit the video data follows:

NMFS Alaska Region
P.O. Box 21668
Juneau, AK 99802-1668

I. **Deck Safety Plan. For each participating vessel,** the designated representative must submit a vessel-specific deck safety plan to NMFS for approval 10 business-days prior to the vessel's first EFP trip. The deck safety plan will detail a safe passage for the observer to access and work at the deck sorting sampling station.

J. **Deck Sorting.** This EFP allows deck sorting of halibut on trips designated as EFP trips when an observer is on duty and present to monitor deck sorting activities. The observer on duty will record length (which will be converted to weight via the International Pacific Halibut Commission conversion tables) and viability of halibut sorted on deck. During EFP hauls, all halibut sorting on deck must be carried out under the direct supervision of the observer on duty.

1. EFP mode is the default fishing mode.
2. Notification to observer of non-deck sorting hauls.
    a. The lead observer will provide the vessel captain with each observer's on-duty schedule, and any changes to that schedule during the trip. This schedule will allow the captain to identify the on-duty observer for purposes of the EFP haul-back and factory notification requirements.
    b. At least 15 minutes prior to fish being brought on board the vessel, the captain, or the mate if the captain is not on duty, is responsible for notifying the on-duty observer if the vessel will not deck sort halibut during that haul. This will be done by "Deck Sort opt-out" notice between the vessel captain and the on-duty observer.
    c. When halibut deck sorting resumes following a "Deck Sort opt-out," the vessel captain, or mate if the captain is not on duty, is responsible for notifying the observer on duty that the vessel is resuming deck sorting. For any haul where deck sorting did not occur, all halibut mortality will be calculated from the halibut collected in the observer species composition sample.
3. Data collection procedures on deck.
    a. For all deck sorting hauls, vessel crew are prohibited from bringing a codend on deck until the observer on duty is present on the deck.
    b. To ensure compliance with item k in this paragraph, the observer will record the time of day that the codend reaches the stern ramp.
    c. Observer must be provided a suitable space on deck, including a work table, to measure halibut and assess viabilities.
    d. The work table must meet the following specifications, unless otherwise approved by NMFS: be between 0.9 and 1.1 meters tall with a table that is at least 0.6 meters deep and 1.2 meters wide; have a lip on at least two sides to prevent fish from sliding off; and have a NMFS-approved length strip secured to the surface. In most cases, the work table will be connected to a ramp, chute, or belt where halibut are slid from the deck and off the

vessel.

e. There must be only a single pathway on deck for halibut to be conveyed to the observer on duty.

f. All halibut sorted on deck must pass over the observer work table.

g. At the discretion of the observer, large halibut sorted on deck, too cumbersome to place on the work table, may be measured and assessed within the pathway from the trawl alley to the point of discard.

h. There must be only a single point of discard after the work table, which must be visible to the observer during deck sorting operations.

i. For any deck sorted haul, crew will pull the codend forward of the live tank hatch. This will provide room for crew to sort halibut from the catch as it flows into the tank. All remaining catch, including the remainder of the halibut not sorted on deck will be dumped into the tank for observer sampling in the factory.

j. The observer will work with the crew to adjust the pace that the crew delivers halibut sorted on deck to the observer for sampling.

k. The time between the codend arriving at the stern ramp and the last halibut discarded on deck may not exceed 35 minutes.

l. The observer will record the time of day that the last halibut is sorted from the catch.

4. Video monitoring of deck sorting. The video monitoring system must show all deck areas where halibut are sorted from groundfish and other components of the catch on deck. (Video system requirements under the EFP are described in Section H of this permit).

K. Transition to Factory

1. If one observer is on duty

a. Once the observer is positioned on the deck area for deck sorting and during the duration of deck sorting activities by the crew and observer: any door between the live tank(s) where EFP catch (that was not removed on deck) is placed and the factory must be closed and any conveyor belt between the live tank and observer sample station must be stopped until observer duties on deck are completed.

b. After completion of deck sorting, upon notification from the observer on duty, the crew may open the live tank door and begin to discharge fish from the vessel's live tank(s) across the flow scale and into the factory.

2. If two observers are on duty. During deck sorting by crew: any door between the live tank(s) where EFP catch (that was not removed during deck sorting) is placed and the factory may remain open and fish may be run over the flow scale and into the factory.

L. Factory Sampling

1. Accounting for halibut in the factory

a. Observer will sample halibut in the factory according to standard catch composition and length and viability sampling procedures developed by FMA.

b. The weight of halibut from the observer species composition sample in the factory will be extrapolated by the NMFS Catch Accounting System to estimate the total weight of halibut recovered in the factory.

c. The total weight of factory halibut for the haul, estimated according to item b in this paragraph, will be assigned the applicable discard mortality rate in Table 19 to the BSAI annual harvest specifications and Table 17 to the GOA annual harvest specifications.

M. Data Management

1. Observers will follow data management responsibilities developed by FMA. These data management responsibilities are described in the observer's training materials. The FMA will provide the observer training materials to the PI in January, 2018 (and at any point revisions are made thereafter).

2. Vessel operator data management responsibilities.

   a. For each EFP trip, the vessel operator must record the following information in "Management Program" in the electronic logbook (eLogbook):

      i. if the management program is A80, OA, or RPP, then the vessel operator must enter "EXP;" and

      ii. if the management program is CDQ, then the vessel operator must enter "CDQ" and they must add a comment into the eLogbook and enter "Deck sorting EFP."

   b. A vessel operator must provide copies of all EFP deck sheets and data to the PI and designated representatives.

   c. Deck sorting video monitoring data requirements are described in Section H of this permit.

3. Vessel owner data-sharing agreement. Vessel owners agree that the vessel's confidential catch and bycatch data collected throughout the EFP for all management programs (including, but not limited to, Amendment 80, TLAS, and CDQ), will be shared among NMFS, the vessel owner, SeaState, Inc., the PI, and designated representatives.

4. Principal Investigator responsibilities

   a. The PI will analyze the EFP data and draft an interim report summarizing the project objectives, areas fished, vessels used, EFP project staff aboard, itinerary and schedule, number of halibut assessed on and below deck, and the weight of halibut and groundfish harvest. This interim report will be presented to the NMFS Alaska Fisheries Science Center and Alaska Region, and the North Pacific Fishery Management Council (Council) at a meeting of the Council, to be announced.

   b. In addition, the PI will submit a more detailed final report of the data and prepare a written report for submission to NMFS within 90 days of completion of fieldwork. That report will encompass activities, results, accounting of any halibut savings generated, any problems and successes, and how well the EFP objectives were accomplished. A copy of that report also will be provided to the Council. If requested, the PI will present the report to the Council and its advisory bodies. Any analysis and report writing are the responsibility of the EFP permit holder.

N. **Sale of Groundfish.** EFP participants will be allowed to sell all groundfish catch retained in compliance with the EFP, regulations, and the law.

O. **Administration of the Activities under Exempted Fishing.** Management of the EFP fieldwork will be the responsibility of the PI, permit holders, and their designated representatives. The PI, a permit holder, or a designated representative must immediately notify the NMFS Alaska Regional Office by contacting Brandee Gerke (907-586-7650) and the owner of any vessel fishing under this permit if there are indications from a vessel operator, project field managers, or other sources that the vessel is not meeting EFP requirements or if there is a departure from the EFP terms and conditions.

P. **Sanctions.** Failure of the PI, permit holders, designated representatives, project field manager, vessel crew, or the owners or operators of the vessels fishing under this EFP to comply with the terms and conditions of this permit, non-exempted provisions of 50 CFR parts 600 and 679, the Magnuson-Stevens Fishery Conservation and Management Act, or any other applicable regulations, may be cause for revocation, suspension, or modification of this permit as well as civil or criminal penalties under the Magnuson-Stevens Act.

Q. **Exemptions from Federal Regulations.** All participants must comply with all requirements of 50 CFR part 679 regulations applicable to vessels participating in Amendment 80, CDQ, Trawl Limited Access fisheries, and groundfish fisheries of the GOA with the exception of the exemptions listed below, These exemptions apply only to the deck sorting of halibut in accordance with the EFP, not other species, during the effective period of the EFP.

1. Biasing Observer Samples. Permit holders, vessel owners, and operators fishing under this permit, are exempt from § 679.7(g)(2) that otherwise prohibits biasing the observer's sampling procedure by pre-sorting halibut catch. The participating vessels will be allowed to account for the number of halibut caught through sampling methods described in Sections J and L of this permit. All other elements of § 679.7(g)(2) continue to apply to all other fishing during an EFP trip. Sorting of PSC species other than halibut will continue to be prohibited.

2. Immediate Return of Prohibited Species to Sea. Vessel owners and operators are exempt from the requirement at § 679.21(a)(2)(ii) to return all prohibited species, or parts thereof, to the sea immediately, with a minimum of injury, regardless of its condition, for the specific purposes related to the additional time out of water needed for scientific and data collection purposes of the EFP: to allow the observer to measure and assess halibut viability on deck and to allow halibut to be handled and tagged for research purposes during EFP hauls designated under the conditions of the permit. Vessel operators must not lift halibut by the caudal peduncle, throw halibut, or otherwise cause additional injury to halibut. Furthermore, species other than halibut are not exempted from this prohibition and must be returned to the sea immediately, with a minimum of injury, regardless of condition.

3. Halibut Flow Scale Exemption. Owners and operators of Amendment 80 vessels participating in this EFP are exempt from the requirement at § 679.93(c)(1), and owners and operators of all other vessels participating in this EFP are exempt from the requirement at § 679.28(b) that all catch of halibut must be weighed on a NMFS-approved scale and made available at a single location. This exemption is necessary to allow observers to take length measurements on halibut caught during EFP designated hauls, and release them to the sea.

APPENDIX A—VESSEL DATA SHEET
MODIFIED EXEMPTED FISHING PERMIT: 2018-01
PERMITTED VESSEL

Name of managing company:

Vessel Name:

Federal Permit Number:

USCG Official Number:

Owner Name:

Owner Address:

Phone:

Fax:

Length Overall:

Gross Tonnage:

Type of Vessel:

Homeport:

Name, phone number, and email of designated representative:

Signature(s) of Designated Representative(s):

_____ _____

_____ _____
Date signed Date signed

The signature(s) above confirm this information, but do not constitute a final commitment to participate in the test operation.

Appendix B. Letter to the NPFMC, June 2018

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

May 30, 2018

Dan Hull, Chairman
North Pacific Fishery Management Council
605 W. 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Dear Mr. Hull:

Enclosed is a draft analysis that National Marine Fisheries Service is developing to evaluate the benefits and costs of a proposed regulatory amendment to allow halibut to be sorted on deck of trawl catcher processors (CPs) when operating in non-pollock groundfish fisheries off Alaska. A draft Regulatory Impact Review was e-mailed to you in May. NMFS staff will present an overview of this draft analysis to the North Pacific Fishery Management Council (Council) at its June 2018 meeting under agenda B2.

The draft regulations are being developed in response to the need reduce the discard mortality of halibut aboard trawl CPs operating in non-pollock fisheries off Alaska. This reduction in discard mortality of halibut will increase the amount of time trawl CPs operating in non-pollock fisheries off Alaska can fish for groundfish before reaching the halibut prohibited species catch (PSC) limit. The objective of deck sorting is to improve viability of halibut that are discarded and reduce the amount of halibut PSC that accrues to the PSC limit, which may provide additional harvest opportunities in the commercial halibut fishery.

NMFS has engaged with vessel and industry representatives to test catch handling techniques and monitoring components through exempted fishing permits (EFPs). Through this process, NMFS staff have worked closely with EFP holders to develop the monitoring and enforcement components discussed in this analysis.

At the June 2018 meeting, NMFS will consult with the Council about the draft analysis to provide an opportunity for Council members and the public to identify questions or other areas of concern with the draft analysis. ***It is not necessary for the Council to take action on this draft analysis for this action to move forward, but the Council may provide feedback or request to review a later draft of the analysis or draft regulations at a future Council meeting.*** NMFS intends to promulgate regulations to establish a voluntary deck sorting program under section 305(d) of the Magnuson-Stevens Act, which authorizes the Secretary of Commerce to develop regulations necessary to implement fishery management plans. We will

address, to the best of our ability, questions or concerns raised by the Council or the public in the draft proposed rule.

We expect to publish a proposed rule for this action by April 2019 and a final rule by late September 2019, which will provide time for vessel modification and inspection prior to fishing under the new requirements starting in January 2020.

Please contact Anne Marie Eich at AnneMarie.Eich@noaa.gov or 907-586-7172 if you have any additional questions about these draft regulations.

Sincerely,

Glen Merrill

James W. Balsiger, Ph.D.
For Administrator, Alaska Region

Enclosure

Appendix C. Appendix S and Appendix T to the 2018 Observer Sampling Manual

Appendix S: Halibut Condition Criteria For Trawl Bycatch

The criteria are listed in order of importance.

Excellent: Fish is alive, showing no stress, and injuries, if any, are slight.

1. External injuries.
   - Superficial nicks or cuts on body.
   - Little (<10% of fin area) or no fraying of dorsal and anal fin.
   - Hemorrhaging (redness) of skin on white side limited to 5-10% of surface area.
2. Operculum pressure.
   - Fish is able to close operculum tightly for at least 5-10 seconds.
   - Muscle tone and physical activity.
   - Strong and lively, perhaps flopping around on deck if provoked.
   - Fish can tightly clench its jaw.
3. Bleeding.
   - No bleeding observed.
4. Gills and gill color.
   - Deep red in color.

Poor: Fish is alive, but showing signs of stress.

1. 1. Injuries are apparent.
   - Body abrasions have damaged the skin but skin is still present, not missing.
   - Cuts and lacerations in body extend through skin just into flesh and are not deep.
   - Between 10 and 50% of dorsal and anal fins are frayed.
   - Slight bleeding from fin edges.
   - Approximately 10-25% of skin on white side of fish shows hemorrhaging.
2. Operculum pressure.
   - Fish closes operculum weakly and not sustained.
3. •Muscle tone or physical activity.
   - Weak, intermittent movement. May respond if stimulated or provoked.
   - Body is limp, but not in rigor mortis.
4. Bleeding.
   - Blood is continually flowing from gills, but not profusely.
5. Gills and gill color.
   - Deep to bright red in color.

Dead: No sign of life or, if alive, likely to die from severe injuries or suffocation.

1. Injuries are apparent.
   - Body cavity ripped open.
   - Internal organs exposed and damaged.
   - Cuts and lacerations in body extend deeply into the flesh.
   - Sediment in mouth.
   - Hemorrhaging in skin on 25% or more of white side.
2. Operculum pressure.
   - Fish does not close operculum.
3. Muscle tone and physical activity.
   - No sign of muscle tone (limp) or fish is in rigor (stiff).
   - Physical activity absent or limited to fin ripples or twitches.
   - Little, if any, response to stimuli.
   - Jaw is hanging open.
4. Bleeding.
   - Blood is flowing freely and continuously in large quantity from a torn or severed gill arch, or a body injury.
5. Gills and gill color.
   - Gills appear washed out, e.g., dull red, pink, or white in color.

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Appendix T: Key to Pacific Halibut Viability for Trawl Vessels

Codes: Excellent = E, Poor = P, Dead = D, Unknown = U

1a. Fish is alive . . . . . Go to 2a

1b. Fish is dead when sorted from the catch . . . . . code **DEAD**

Fish is in rigor and lifeless, even if no apparent injuries. Gills appear washed out, i.e., dull red, pink, or white in color. Mouth may contain sediment.

2a. Body of fish appears uninjured, or has only minor injuries . . . . . Go to 3a

2b. Injuries to fish are significant and obvious . . . . . code **DEAD**

Body cavity is ripped open, exposing internal organs. Body tissue may be torn or ripped in a rough, ragged manner. Red hemorrhaging observed on 25% or more of the white side.

3a. Fish is able to close operculum when stimulated . . . . . Go to 4a

Operculum is closed strongly or weakly, but pressure is evident. Operculum may not stay closed for long, though pressure may last up to 5 seconds or longer.

3b. Fish cannot close operculum, even when stimulated. . . . . code **DEAD**

4a. Fish displays activity and has muscle tone . . . . . go to 5a

Fish displays a minimal amount of activity, especially when stimulated. May be able to clench jaw tightly.

4b. Fish exhibits no muscle tone . . . . . code **DEAD**

5a. Fish is not bleeding, or only slightly bleeding, if at all . . . . . go to 6a

5b. Blood is flowing freely and continuously in large quantity (profusely . . . . . code **DEAD**

Bleeding is coming from a torn or severed gill arch, or a body injury.

6a. Body injuries are minimal, perhaps difficult to find. . . . . go to 7a

May consist of superficial nicks or cuts on body. Less than 10% of dorsal and anal fin area is frayed.

6b. Body injuries are readily apparent . . . . . code POOR

Skin is damaged with abrasions. Cuts and lacerations in body extend through the skin and just barely into the flesh (not deeply). Dorsal and anal fin area is frayed between 10-50% Fin edges may be bleeding. Roughly 10-25% of the white side of fish shows red hemorrhaging.

7a. Operculum pressure is strong and sustained . . . . . go to 8a

7b. Operculum pressure is weak and not sustained . . . . . code **POOR**

8a. Fish is strong and lively, displaying good muscle tone. . . . . go to 9a

Fish is flopping around the deck, hard to control. Jaw may be tightly clenched, difficult to open.

8b. Fish appears weak . . . . . code **POOR**

Movement is intermittent, perhaps occurring when provoked or stimulated. Body is limp.

9a. Fish is bleeding from gills . . . . . code **POOR**

Blood is flowing continuously, slow and steadily, but not profusely. Gills are deep to bright red in color.

9b. No bleeding observed . . . . . code **EXCELLENT**

Gills are deep red in color.

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Appendix D. Industry Cost of Compliance Survey

Halibut Deck Sorting EFP compliance cost survey:

Please provide an estimate of your Designated Representative annual labor cost associated with deck soring EFP management and compliance (total hours and average wage rate).

Please estimate the labor cost of pre-EFP trip meetings (total hours and average wage rate).

Please estimate additional labor costs on board the vessel associated with observer notifications of the intent to deck sort halibut, and vessel operator compliance with data management requirements under the EFP (hours per day when participating and average estimated hourly wage rate).

How many additional observers have you carried and for what duration (number and days per year)?

Please estimate the cost of the installed deck sorting video monitoring system: Please include equipment cost, installation cost, and any ongoing operation and maintenance costs.

Please estimate the added cost of materials necessary to allow halibut deck sorting under the EFP (e.g observer work table, ramps, chutes, belts etc.).

Please estimate daily crew time and average wage rate per hour required to perform deck sorting.

Please estimate daily crew time and average wage rate per hour required to perform factory sorting and conducting the industry count of factory halibut, if applicable.

Please describe any additional costs you may have incurred to participate in the deck sorting EFP (e.g. vessel modifications or other operational changes).

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R:\region\archives\2019augl\Hal Deck Sort.RIR_Final