INITIAL REVIEW DRAFT

**Environmental Assessment/ Regulatory Impact Review/
Initial Regulatory Flexibility Analysis
for Proposed Amendment
to the Fishery Management Plans for Bering Sea Aleutian Islands
Groundfish and Gulf of Alaska Groundfish**

Moving Squid to the Ecosystem Component

May, 2016

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Abstract: This document analyzes alternatives pertaining to an action that could move all species of squid in 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) from being 'in the fishery' to the ecosystem component (EC). Options are included for periodic stock assessment and mandatory catch monitoring as well as a range of maximum retainable amount (MRA) of squid per target groundfish catch should squid be moved to the EC in both FMPs. There are no significant (beneficial or adverse) impacts on squid stocks, salmon PSC or significant (beneficial or adverse) socio-economic impacts on the groundfish fisheries.

List of Acronyms and Abbreviations

AAC	Alaska Administrative Code
ABC	acceptable biological catch
ADF&G	Alaska Department of Fish and Game
AEQ	adult equivalent
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
AGDB	Alaska Groundfish Data Bank
AKFIN	Alaska Fisheries Information Network
ANILCA	Alaska National Interest Lands Conservation Act
BASIS	Bering Sea-Aleutian Salmon International Survey
BEG	biological escapement goal
BOF	Board of Fish
BSAI	Bering Sea and Aleutian Islands
CAS	Catch Accounting System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COAR	Commercial Operators Annual Report
Council	North Pacific Fishery Management Council
CP	catcher/processor
CV	catcher vessel
CWT	coded-wire tag
DPS	distinct population segment
E	East
E.O.	Executive Order
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	endangered species unit
FMA	Fisheries Monitoring and Analysis
FMP	fishery management plan
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRFA	Final Regulatory Flexibility Analysis
ft	foot or feet
GHL	guideline harvest level
GOA	Gulf of Alaska
ID	Identification
IRFA	Initial Regulatory Flexibility Analysis
IPA	Incentive Plan Agreement
IQF	individually quick frozen
JAM	jeopardy or adverse modification
lb(s)	pound(s)
LEI	long-term effect index
LLP	license limitation program
LOA	length overall
m	meter or meters
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act

MMPA	Marine Mammal Protection Act
MSST	minimum stock size threshold
t	tonne, or metric ton
NAICS	North American Industry Classification System
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NMFS	National Marine Fishery Service
NOAA	National Oceanic and Atmospheric Administration
NPAFC	North Pacific Anadromous Fish Commission
NPFMC	North Pacific Fishery Management Council
NPPSD	North Pacific Pelagic Seabird Database
Observer Program	North Pacific Groundfish and Halibut Observer Program
OEG	optimal escapement goal
OMB	Office of Management and Budget
PBR	potential biological removal
PSC	prohibited species catch
PPA	Preliminary preferred alternative
PRA	Paperwork Reduction Act
PSEIS	Programmatic Supplemental Environmental Impact Statement
PWS	Prince William Sound
RFA	Regulatory Flexibility Act
RFFA	reasonably foreseeable future action
RIR	Regulatory Impact Review
RPA	reasonable and prudent alternative
RSW	refrigerated seawater
SAFE	Stock Assessment and Fishery Evaluation
SAR	stock assessment report
SBA	Small Business Act
Secretary	Secretary of Commerce
SEG	sustainable escapement goal
SET	sustainable escapement threshold
SNP	single nucleotide polymorphism
SPLASH	Structure of Populations, Levels of Abundance, and Status of Humpbacks
SRKW	Southern Resident killer whales
SSFP	Sustainable Salmon Fisheries Policy
SW	southwest
TAC	total allowable catch
U.S.	United States
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VMS	vessel monitoring system
W	West

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Executive Summary

This document analyzes alternatives pertaining to an action that could move several species of squid in 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) from being 'in the fishery' to the ecosystem component.

Purpose and Need

The Council adopted the following problem statement to originate this action in October 2015:

Establishing appropriate catch specifications for squid species in the BSAI and GOA has been problematic. The abundance of squid in the BSAI and GOA is uncertain and trawl survey biomass estimates, while available, likely greatly underestimate the true population level. Development of biological reference points is complicated by a lack of information. OFL and ABC specifications for squid have been based on average catch calculations which poorly estimate the OFL and potentially constrain fisheries. Squid are short-lived, highly productive, and an important prey species. There are no directed fisheries for squid in either the BSAI or GOA, there is limited retention, and there are no conservation concerns for squid populations in either region. According to the National Standard 1 guidelines, in order to be designated as an "ecosystem component" (EC), the species or species group should be a non-targeted species or species group; not subject to overfishing, overfished, or approaching an overfished condition; not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and not generally retained (a small amount could be retained) for sale or personal use. As such, moving squid to the Ecosystem Component seems to meet the intent of this category in the FMPs, and will continue to promote conservation and management measures for squid while alleviating unnecessary constraints on other groundfish fisheries.

Alternatives

Two alternatives are considered in this analysis.

Alternative 1 would continue to manage squids 'in the fishery' in both the BSAI and GOA groundfish FMPs. OFL, ABC, and TAC will continue to be set for squids in both areas. Stock assessments for squids would continue to be done annually. Directed fishing for squids is allowed, however given the low TAC established annually for both the BSAI and GOA groundfish specifications, NMFS has determined that existing TAC levels are not sufficient to support a directed fishery in either region and thus continues to place squids in both areas on bycatch-only status. Therefore squids are taken only as incidental catch in groundfish fisheries (primarily pollock fisheries) in both regions.

Under Alternative 1, MRAs for squids as an incidental catch species are established at 20%. This allows vessels fishing for groundfish to retain a quantity of squids equal to, but no more than, 20% percent of the round weight or round weight equivalent of groundfish species open to directed fishing that are retained on board the vessel at any time during a fishing trip.

Alternative 2 would include squids in the ecosystem component category in both the BSAI and GOA groundfish FMPs. Catch specifications (OFL, ABC, TAC) would no longer be required. Directed fishing for squid species would be prohibited. If selected, **Option 1** would require a periodically updated stock assessment for squid and catch monitoring would continue to occur.

Option 2 would establish an MRA for squid species as incidental catch in the BSAI and GOA consistent with current 20% at a level to discourage retention while allowing flexibility to prosecute groundfish fisheries.

Two suboptions of MRAs are also considered:
Suboption 1: Establish MRA at 2% consistent with forage fish species
Suboption 2: Establish MRA at 10%

The suboptions for lower MRAs are considered to discourage any targeted fishing for squid. The lower range MRA has been used in the forage fish classification with the rationale being to ban targeted fishing of these ecologically important species. Absent selection of any MRA under Alternative 2, Option 2, all squids could theoretically be retained. However, the Council would need to provide direction as to what percentage amount of retention would constitute directed fishing, in order to meet the requirements of the ecosystem component category.

Meeting the requirements for EC
Under National Standard 1 guidelines, in order to be designated as an "ecosystem component" (EC), the species or species group should be:

- a non-targeted species or species group;
- not subject to overfishing, overfished, or approaching an overfished condition;
- not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and
- not generally retained (a small amount could be retained) for sale or personal use.

While reliable biomass estimates to set biological reference points are lacking for squid species, there are observations that squids have inherently high stock productivity due to their rapid growth, maturation, and short lives, and evidence from other areas (e.g., NEFMC 2010) suggest it is unlikely a highly productive stock could be overfished in the absence of an intensive directed fishery. Further estimates from ecosystem models indicate that the current survey biomass estimates would represent a substantial underestimate of overall biomass (Ormseth, 2015a). Untargeted, squids are unlikely to pose a conservation concern. As noted by the SSC in December 2015, 'Current levels of incidental catch in the BSAI and GOA are well below those that would pose a conservation concern, and likely much less than MSY.' Given that squids are truly an incidentally caught species with retention primarily due to full-retention requirements and processing for bait it seems unlikely that current catch levels pose any conservation concern regardless of catch limits. Therefore squids in both the GOA and BSAI seem to meet the first three of the requirements for EC.

While caught incidentally squids are retained in fairly substantial amounts. Retention rates in the BSAI have been as high as 71% since 2003 and as high as 92% in the GOA. Further evaluation of whether retained squids are sold or turned into fishmeal (only) indicates that the relative proportion of retained squids processed to product types is also fairly substantial, particularly in the BSAI where it has ranged as high as 99% of retained catch in 2009. The proportion processed to product type is lower in the GOA but has still reached a high of 51% in 2005. In the first few years squids were sold only as bait, but product

types now being processed may include food quality products as well as bait[1]. **Therefore it seems unclear to what extent squids in BSAI and GOA meet the fourth requirement for EC. The Council may also wish to revise its problem statement given the observed high retention rates of squid.**

However, NMFS is currently revising the National Standard 1 Guidelines. The proposed rule[2] for the revised National Standard 1 guidelines would modify the ecosystem component criteria, specifically the criteria for determining when a stock needs conservation and management. The proposed rule would remove the specific listed four criteria for the EC designation and refer instead to whether a stock needs conservation and management under revised guidelines. NMFS may still modify the proposed guidelines further based on public comments so the final guidelines will not be available until NMFS publishes the final rule. NMFS anticipates publishing a final rule in the next several months.

Environmental Assessment

Enviromental impacts of this action are limited to direct impacts on squid and squid management and indirect impacts on Chinook and chum salmon PSC. No other impacts are anticipated to other resource categories.

Squids

Squids have short, sometimes less than 1 year life-spans. Limited life-history information exists and there are no reliable biomass estimates. Bottom trawl survey biomass estimates are considered substantial underestimates of true biomass in both the BSAI and GOA. Squids are important prey species and food web models have indicated substantially higher biomass of squid than any of the trawl survey biomass estimates based on their role in the ecosystem. Use of food web models gives an indication of the relative impact of fishing mortality as compared with predation mortality on squids and as noted fishing mortality is extremely low compared with the estimated predation mortality (Ormseth 2011, 2012). Therefore the current fishing mortality is considered insignificant at a population level to affect the squid stock status under either FMP.

The spatial and temporal distribution of squids is variable, and on a local-scale removals should be monitored to ensure that spatial and temporal impacts are minimized. There is some potential for localized depletion in specific areas where squids catch is concentrated. However, while this may affect a cohort spatially and temporally in a discreet area, this is not thought to have a population effect on squid as a whole. Therefore spatial and temporal effects under status quo on squids are considered insignificant.

Alternative 2 would neither decrease nor likely substantially increase the incidental catch of squid in groundfish fisheries as squid do not appear to be targeted in any way, thus catch is likely truly incidental. It is likely that catch would be similar to status quo under Alternative 2, particularly in the GOA. Some additional catch may occur in the EBS pollock fleet as the incentive to move fishing location in response to high squid catch (in the absence of an MRA) would be decreased.

Alternative 2, Option 1 would provide for continued recordkeeping and reporting of squid catches as well as a periodically updated stock assessment. NMFS in-season management already monitors squid catches in the Catch Accounting System (CAS) thus there is no additional burden to continue to monitor and

[1] Note that this is based on examining COAR production for multiple years showing squids as more than just meal and bait by multiple processors, however these data are being re-assessed as there are indications that it was mis-reported as product.
[2] https://alaskafisheries.noaa.gov/sites/default/files/80fr2786.pdf

report squid catches. An annual stock assessment is produced with additional information added in survey "off-years" consistent with stock assessment protocols for all other stocks in the BSAI and GOA FMPs. If Option 1 were selected the Council could specify that rather than producing an Executive Summary assessment for squids in survey 'on' years that the stock assessments for each area be produced biennially in survey "off" years. This would be consistent with current protocols for Forage Fish assessments and for Grenadiers which are also in the EC in both FMPs.

Alternative 2 Option 2 would manage squids in the EC under an MRA. The options for MRAs include a 2% (suboption 1), 10% (suboption 2) and 20% MRA (status quo). Based on observed retention rates, it is likely that the suboptions for a 2% or 10% MRA would be constraining. It is not clear that there is any conservation benefit to a constraining MRA when squids are not being targeted and with the assumption of 100% mortality in the squid catch. Thus any constraining MRA is most likely to simply increase discards of dead squid rather than discourage targeting. As the Council did not explicitly specify that Option 1 be selected if Option 2 is selected, some direction would be necessary under this circumstance in order to estimate compliance with the MRA.

The analysis considers the impact of not specifying an MRA under Alternative 2, if Option 2 is not selected. In this instance, the Council would need to identify what is considered to be directed fishing, as it is a requirement of the EC that a species is not targeted. There is the potential that there is some on-going avoidance currently and that current incidental catch rates are not representative of intrinsic rates. Thus, in the absence of an MRA or with a higher MRA than status quo squid catch could be higher than currently observed. This is especially a potential in the BSAI. If Alternative 2 is adopted and if management measures by the pollock fleet were to change, SeaState may stop issuing notifications to pollock vessels of high squid area and/or closures of the squid box. Under those circumstances, and with no MRA in place, the fleet would have no incentive to move from good pollock fishing grounds with low salmon bycatch and high squid bycatch.

There remains a possibility that fisheries may cause localized depletions of squid prey fields. Predation on squids is not well understood, particularly because the size of squids (and therefore the age and species) that are preyed upon is very uncertain. However while the potential exists, there is as yet no evidence that exists for localized depletions. There are no significant impacts (beneficial or adverse) to squid stocks under either of the alternatives.

Chinook and chum salmon PSC

Impacts to salmon PSC result from movement of the pollock fleet to avoid squid. These constraints are only in the BSAI where management measures have been adopted by the fleet voluntarily to close areas of high squid bycatch to avoid reaching an OFL. There are no anticipated impacts to salmon PSC in the GOA, as squid incidental catch has not been constraining nor caused any avoidance measures.
In the EBS pollock fishery, in response to potentially constraining Chinook PSC limits combined with stringent vessel-level Incentive Plan Agreement requirements, the pollock industry has been extremely responsive to incidences of increased salmon bycatch. However, recent catches of squids have resulted in additional requirements to move away from areas of high squid bycatch, and industry closures of productive pollock fishing grounds which have compromised the fleet's ability to avoid chum and Chinook salmon. Alternative 2, moving squid to EC, has the potential to reduce the adverse impact on chum and Chinook salmon as it would allow the EBS pollock fleet additional flexibility in fishing in areas where fishing rates are good and salmon bycatch is low. There are no significant impacts (beneficial or adverse) to salmon PSC under either of the alternatives.

Regulatory Impact Review

Alternative 1, No Action
At present, the OY cap established in the Groundfish FMP for the GOA is substantially greater than the total of all GOA TACs. Thus, continuing to place squid "in the fishery' in the GOA does not require "funding" of squid TAC via reductions in TACs of any other groundfish species. Further, since the present and past harvests of squid taken incidentally are well below the current ABCs calculated for squids, there would be no significant effects (either adverse or beneficial) on the stock biomass, fishing mortality, spatial or temporal distribution, or changes in prey availability for squids and groundfish target species in the GOA. There would be no significant (either beneficial or adverse) socioeconomic effects on those who harvest squid or other groundfish targets in the GOA.

In contrast to the potential effects of Alternative 1 in the GOA, continuing to place squids "in the fishery" in the BSAI FMP may have adverse effects on fishery total revenue. The BSAI Groundfish FMP specifies a total OY cap of 2 million mt. The total of all BSAI groundfish TACs may not exceed this 2 million mt cap. Thus, continuing to place BSAI squids "in the fishery" means that squid incidental catch would continue to be "funded" from reduced TAC of other, presently more valuable, BSAI groundfish species. In past years, the actual amount of reduction in TAC in other BSAI groundfish target fisheries with squid "in the fishery" in the BSAI has ranged from a low of 310 mt in 2014 to high of 1,970 mt for 2007-2010. However, it is also the case that TAC amounts for some groundfish species in the BSAI are not fully utilized under current conditions thereby reducing any impact of continuing to fund a squids TAC.

Alternative 2, Include squids in the FMP as an Ecosystem Component species
Under Alternative 2, which would include squids in the groundfish FMP as "ecosystem component" species, OFLs, ABCs, and TACs, would not need to be established. However, other management measures, and recordkeeping and reporting requirements could be established for squid. Since past harvests of squids taken incidentally are generally below the ABCs calculated for squids, there would be no significant effects on the stock biomass, fishing mortality, spatial or temporal distribution, or changes in prey availability for squids and groundfish target species in either the BSAI or GOA. There would be no significant socioeconomic effects on those who harvest squid or other groundfish targets in either the BSAI or GOA.

Alternative 2 prevents targeting of squids and prevents a "directed fishery" from being developed as well. This alternative allows for a continued small amount of squid to be retained and marketed; however, establishing a formal directed fishery would require further regulatory action. The action alternative would also prevent use of squid incidental catch as a basis species for retention of other groundfish.

One of the advantages of this alternative is pollock vessels would not have to relocate to other areas of the BSAI and GOA in order to avoid catching squid. The BSAI pollock fleet has a voluntary squid agreement to reduce squids catch in order to avoid closing the pollock fishery. This action would allow greater flexibility for the pollock fleet to seek areas of higher pollock CPUE and lower salmon bycatch without the limitations associated with catching squids incidentally.

Option 1: Continue to monitor and report catch of squid species
Since an ecosystem component species allows for a small amount of squids to be retained and marketed, and Option 1 continues monitoring and reporting, thus the effects of this option are that the Council and NMFS would continue to get annual reports of squid catch and retention.

Option 2: Establish an MRA for squid species as incidental catch in the BSAI and GOA at 20%
Two suboptions of MRAs are also considered:

Suboption 1: establish MRA at 2% consistent with forage fish species
Suboption 2: establish MRA at 10%

Since an ecosystem component species allows for a small amount of squids to be retained and marketed, and Option 2 would leave in place the existing MRA of 20 percent, it is likely that the retention of squids would continue at current levels or increase slightly given vessels would not be required to relocate from areas of high squid bycatch. Currently the MRA is 20% for the basis species and retention rates greater than 20% have been rare in the BSAI and GOA pollock fisheries, which have the highest squid catch. From 2013-2015, there were 42,338 hauls in the BSAI and 1,940 hauls in GOA. Of those total hauls in the BSAI, 15 hauls would have exceeded a 20% MRA during the 2013-2015 period, while in the GOA, 2 hauls would have exceeded a 20% MRA.

Option 2 includes two suboptions for consideration. Suboption 1 would establish a MRA at 2% consistent with forage fish species and Suboption 2 would establish a MRA at 10%. There appears to be no conservation issue that would necessitate reducing the MRA from the existing 20%. The amount of squids that are caught and retained currently is limited and the economic value of the retained squids is also limited. Lower MRA percentages would likely have some negative impacts on individual vessels due to the need to sort and discard squids at sea to stay below a 2% MRA or 10% MRA. Since there appears to be no conservation issue that necessitates reducing the squid MRA from its existing 20% in the BSAI and GOA, and the limited economic value of squids, reducing the MRA to 2% or 10% would increase operating costs for vessels while not providing any perceivable conservation benefit.

Comparison of Alternatives for Decision-making

This summary table provides a summary of key decision points under Alternatives 1 and 2 with a summary of associated management and enforcement issues following the table. The Council did not specify that Alternative 2, Option 1 must be selected if Option 2 is selected thus it is unclear how catch accruing to an MRA would be assessed if recordkeeping and recording were not required. **The Council should clarify if Option 1 must be selected if Option 2 is selected under Alternative 2. If Alternative 2, Option 2 is not selected, the Council should provide guidance as to what constitutes directed fishing.**

Summary of Management Measures in Alternative 1 and 2

Management Measure	Alt 1- No Action	Alt 2 - Ecosystem Component
Prohibit a Directed Fishery	**No** However NMFS has not opened squid to directed fishing	**Yes** prohibit directed fishing in regulations at 679.20(i)
Retention and sale	**Yes** Retention and sale allowed.	**No** Some small amount can be retained and sold. Need guidance on amount that qualifies as small.
Annual Harvest Specifications	**Yes** - annual stock assessment - TAC assessed in optimum yield	**No** - stock assessment optional (option 1 would provide for periodic assessment) - catch not assessed in optimum yield
Incidental Catch Management	**Yes** - MRA as incidental catch species = 20%	**Yes if Option 2 selected otherwise No** - MRA as incidental catch species = options for 20%, 10%, 2% - If option 2 not selected, Council must provide guidance on what % retention qualifies as 'directed fishing'
Recordkeeping and Reporting	**Yes** - require catch reporting	**Yes if Option 1 selected otherwise No** require catch reporting (option 1)

Some management and enforcement issues are identified with management under Alternative 1 including:

- Monitoring catch at the individual trip level to ensure that the squid MRA is not exceeded
- Monitoring cumulative catch to insure that catch is not approaching the ITAC
- Determining if additional TAC is available to be added to the ITAC
- Placing squid on prohibited species status when total TAC is exceeded or projected to be exceeded
- Considering further directed fishery closures when harvest approaches the OFL
- Challenge for enforcement to determine appropriate penalty for squid MRA overages due to low price of squid.
- Marked increase in enforcement actions when BSAI squid were place on prohibited species status in 2015.

Depending upon the selection of an MRA suboption under Alternative 2 many of these management and enforcement issues would be alleviated. However, should the Council select Alternative 2 without an MRA suboption, then the Council would need to specify some fishing threshold that constitutes directed fishing as it would be prohibited by moving squids into the EC in both FMPs. NMFS's enforcement burden is likely to increase should the Council select any MRA lower than the status quo.

The Council may wish to revisit rationale for moving squids into the EC category following the approved National Standard guidelines in 2016. The Council may also wish to consider additional alternative management measures to address concerns with inadequate catch specifications for squids.

1 Introduction

This document analyzes alternatives pertaining to an action that could move several species of squid in 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) from being 'in the fishery' to the ecosystem component.

This document is an Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA). An EA/RIR/IRFA provides assessments of the environmental impacts of an action and its reasonable alternatives (the EA), the economic benefits and costs of the action alternatives, as well as their distribution (the RIR), and the impacts of the action on directly regulated small entities (the IRFA). This EA/RIR/IRFA addresses the statutory requirements of the Magnuson Stevens Fishery Conservation and Management Act, the National Environmental Policy Act, Presidential Executive Order 12866, and the Regulatory Flexibility Act. An EA/RIR/IRFA is a standard document produced by the North Pacific Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS) Alaska Region to provide the analytical background for decision-making.

1.1 Purpose and Need

The Council adopted the following problem statement to originate this action in October 2015:

Establishing appropriate catch specifications for squid species in the BSAI and GOA has been problematic. The abundance of squid in the BSAI and GOA is uncertain and trawl survey biomass estimates, while available, likely greatly underestimate the true population level. Development of biological reference points is complicated by a lack of information. OFL and ABC specifications for squid have been based on average catch calculations which poorly estimate the OFL and potentially constrain fisheries. Squid are short-lived, highly productive, and an important prey species. There are no directed fisheries for squid in either the BSAI or GOA, there is limited retention, and there are no conservation concerns for squid populations in either region. According to the National Standard 1 guidelines, in order to be designated as an "ecosystem component" (EC), the species or species group should be a non-targeted species or species group; not subject to overfishing, overfished, or approaching an overfished condition; not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and not generally retained (a small amount could be retained) for sale or personal use. As such, moving squid to the Ecosystem Component seems to meet the intent of this category in the FMPs, and will continue to promote conservation and management measures for squid while alleviating unnecessary constraints on other groundfish fisheries.

1.2 History of this Action

The Magnuson-Stevens Act requires that each regional fishery management council develop annual catch limits (ACLs) and accountability measures (AMs) for each of its managed fisheries designated as being in the fishery, such that each FMP under its jurisdiction has a mechanism for specifying ACLs at a level that overfishing does not occur in the fishery. The reauthorized MSA strengthened provisions to prevent and end overfishing and rebuild depleted fisheries. NMFS revised to National Standard 1 (NS1) guidelines at 50 CFR 600.310, to integrate these new requirements intended to reduce overfishing with existing provisions related to overfishing, rebuilding overfished stocks, and achieving optimum yield. On January 16, 2009, NMFS issued final guidelines for NS1 (74 FR 3178).

In the National Standard 1 guidelines NMFS recommends two categories for species in an FMP; "in the fishery" and "ecosystem component." Amendments 96/87 established the EC category and designated

prohibited species (defined in Table 2b to Part 679, and includes salmon, steelhead trout, crab, halibut, and herring) and forage fish (as defined in Table 2c to part 679 and § 679.20(i)) as EC species in both the BSAI and GOA FMPs. For EC species, NMFS retained the existing conservation regulations (such as no retention of prohibited species and the maximum retainable amount of 2 percent for forage fish).

Since approximately 2010, the NPFMC non-target committee, the Plan Teams, and the SSC have at various times recommended that the NPFMC explore moving squids to the Ecosystem Component (EC) category. The rationale was always that as an extremely short-lived and highly productive group of species, it is very unlikely that squid could be overfished in the absence of a directed fishery. As a result squid bycatch (from a population perspective) is not a conservation concern.

In 2015, the groundfish plans teams for the BSAI and GOA recommended again that consideration be given to moving squid into the EC category. These recommendations were based upon the difficulty in establishing catch specifications for squid in both management regions as well as concerns that in the EBS pollock fishery, moving away from areas of squid incidental catch interfered with the fleet's avoidance of Chinook and chum salmon PSC. Squids are managed under Tier 6 because the groundfish bottom trawl surveys do not provide reliable biomass estimates and thus specifications are recommended based upon different calculations based upon average catch. In some years this has led to actual catches which well exceed the TAC and sometimes the ABC particularly in the BSAI. While catches have not exceeded the OFL, they have exceeded the ABC and approached the OFL in the BSAI. This has prompted additional in-season management actions and industry-led voluntary area closures in the EBS pollock fishery in order to prevent catch exceeding the OFL which would result in BSAI groundfish fishery-wide closures. The assessment author, the Plan Teams, and the SSC are in agreement that it is highly unlikely that current catch levels or catches approaching the revised 2016-2017 harvest specifications would result in a conservation concern for BSAI or GOA squids. Therefore, the Council initiated an amendment to consider moving squids into the EC category in October 2015.

1.3 Description of Management Area

This action pertains to all management areas in the GOA (Figure 1-1) and BSAI (Figure 1-2). In both regions squids are managed area-wide (i.e. Gulfwide specifications and BSAI-wide specifications) rather than by specific regulatory areas or sub-areas.

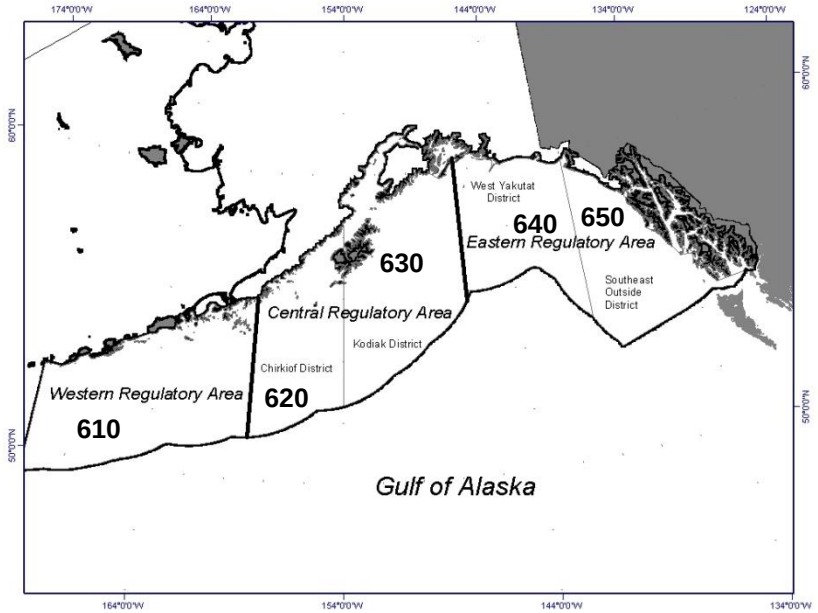

Figure 1-1 Regulatory and reporting areas in the GOA.

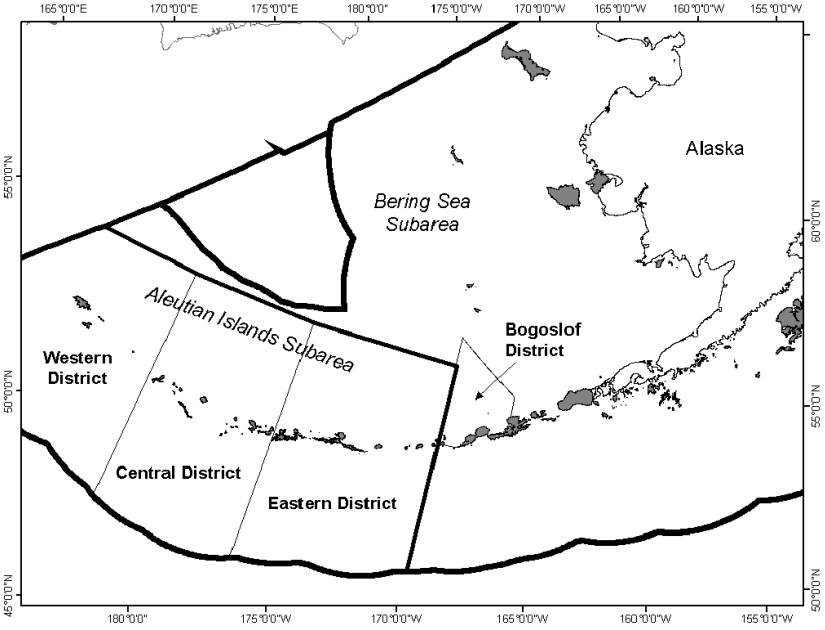

Figure 1-2 BSAI sub-areas for management

2 Description of Alternatives

NEPA requires that an EA analyze a reasonable range of alternatives consistent with the purpose and need for the proposed action. The alternatives in this chapter were designed to accomplish the stated purpose and need for the action. All of the alternatives were designed to provide for appropriate management and monitoring for squids stocks in the BSAI and GOA without unnecessarily constraining groundfish fisheries.

The Council adopted the following alternatives for analysis in October 2015.

Alternative 1: No Action

Alternative 2: Move squids to Ecosystem Component in both BSAI and GOA

> **Option 1:** Continue to monitor and report catch of squid species annually and continue to report on the status of the stock in periodic stock assessments for squid in both BSAI and GOA
>
> **Option 2:** Establish an MRA for squid species as incidental catch in the BSAI and GOA at 20%
> Suboption 1: Establish MRA at 2% consistent with forage fish species
> Suboption 2: Establish MRA at 10%

Individual alternatives, options and sub-options are described in detail below.

2.1 Alternative 1, No Action

Under Alternative 1, squids would continue to be managed 'in the fishery' in both the BSAI and GOA groundfish FMPs. OFL, ABC, and TAC will continue to be set for squids as a species group in both areas. Stock assessments for squids would continue to be done annually. Directed fishing for squids is allowed however given the low TAC established annually for both the BSAI and GOA groundfish specifications, NMFS has determined that existing TAC levels are not sufficient to support a directed fishery in either region and thus continues to place squids in both areas on bycatch-only status. Therefore squids are taken only as incidental catch in groundfish fisheries (primarily pollock fisheries) in both regions.

Under Alternative 1, MRAs for squids as an incidental catch species are established at 20% (Table 10, GOA Retainable Percentages, and Table 11, BSAI Retainable Percentages, to 50 CFR 679). This allows vessels fishing for groundfish to retain a quantity of squids equal to, but no more than, 20% percent of the round weight or round weight equivalent of groundfish species open to directed fishing that are retained on board the vessel at any time during a fishing trip.

2.2 Alternative 2, Move squids to the Ecosystem Component category in both FMPs.

This alternative would include squids in the ecosystem component category in both the BSAI and GOA groundfish FMPs. Catch specifications (OFL, ABC, TAC) would no longer be required. Directed fishing for squid species would be prohibited. Absent selection of an MRA under Alternative 2, Option 2, all

squids could be retained. Option 2 to this alternative (section 2.2.2) includes a range of MRAs for squids in both areas from 2-20 percent of the basis groundfish species. However, without Option 2, the Council would need to provide direction as to what percentage amount of retention would constitute directed fishing, in order for squids to continue to meet the requirements of the ecosystem component category.

According to the National Standard 1 guidelines, in order to be designated as an "ecosystem component" (EC), the species or species group should be:

- a non-targeted species or species group;
- not subject to overfishing, overfished, or approaching an overfished condition;
- not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and
- not generally retained (a small amount could be retained) for sale or personal use.

According to the National Standard 1 guidelines, it is important to consider whether use of the EC species classification in a given instance is consistent with Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) conservation and management requirements. Species may be included in the FMP as an EC for any of the following reasons: for data collection and catch monitoring purposes; for ecosystem considerations related to specification of optimum yield (OY) for the associated fishery; as considerations in the development of conservation and management measures for the associated fishery; or to address other ecosystem concerns. While EC species are not considered to be "in the fishery," the Council should consider measures for the fishery to minimize incidental catch and mortality of EC species consistent with National Standard 9, and to protect their role in the ecosystem. EC species do not require specification of biological reference points, but should be monitored as new, pertinent scientific information becomes available to determine changes in their status or their vulnerability to the fishery.

The catch of EC species is required to be reported for monitoring purposes and directed fishing for EC species is prohibited. Under the ecosystem component, targeting squid would not be possible without moving them back into the "in the fishery" category and establishing status determination criteria for these stocks. Moving a species from the EC to "in the fishery" would need to be investigated under various situations, including when or if the industry expresses an interest in targeting squid.

2.2.1 Option 1: Continue to monitor and report catch of squid species annually and continue to report on the status of the stock in periodic stock assessments for squid in both BSAI and GOA.

Under Option 1 current catch accounting would continue to occur for squid species in both FMPs. A periodically updated stock assessment for squid species in both the GOA and BSAI would also be completed. This would presumably be done on "off-years" as with forage fish and grenadiers on both areas whereby in years when there is no bottom trawl survey (GOA) or AI survey (BSAI) assessments for these categories are completed. The Council in selecting this option could specify whether or not an annual or biennial assessment would be desirable to continue to monitor the status of squids species in both FMPs. Absent selection of Option 1, no catch monitoring of squid s species in either FMP would occur and no stock assessment would occur.

2.2.2 Option 2: Establish an MRA for squid species as incidental catch in the BSAI and GOA at 20%

Option 2 would establish an MRA for squid species as incidental catch in the BSAI and GOA using the MRAs (20%) in Tables 10 and 11 of 50 CFR 678 when directed fishing for groundfish species at a level to discourage retention while allowing flexibility to prosecute groundfish fisheries.

Two suboptions of MRAs are also considered:
Suboption 1: Establish MRA at 2% consistent with forage fish species
Suboption 2: Establish MRA at 10%

The suboptions for lower MRAs are considered to discourage any targeted fishing for squid. The lower range MRA has been used in the forage fish classification with the rationale being to ban targeted fishing of these ecologically important species.

2.2.3 Meeting the requirements for EC

The current NS1 guidelines include suggested classifications of ''stocks in the fishery'' and ''ecosystem component (EC) species.'' See Figure 2-1 for a diagram of classifications. The classifications in the NS1 guidelines are intended to reflect how FMPs have described ''fisheries,'' and to provide a helpful framework for thinking about how FMPs have incorporated, and may continue to incorporate, ecosystem considerations. To that end, the NS1 guidelines describe the fact that FMPs typically include certain target species, and sometimes certain non-target species, that the Councils and/or the Secretary believed required conservation and management. In some FMPs, Councils have taken a broader approach and included hundreds of species, many of which may or may not require conservation and management, but could be relevant in trying to further ecosystem management in the fishery.

NMFS wants to encourage ecosystem approaches to management, thus, it proposed the EC species as a possible classification a Council or the Secretary could—but is not required to—consider. The NS1 guidelines do not require a Council or the Secretary to include all target and non-target species as ''stocks in the fishery,'' do not mandate use of the EC species category, and do not require inclusion of particular species in an FMP. The decision of whether conservation and management is needed for a fishery and how that fishery should be defined remains within the authority and discretion of the relevant Council or the Secretary, as appropriate. NMFS presumes that stocks or stock complexes currently listed in an FMP are ''stocks in the fishery,'' unless the FMP is amended to explicitly indicate that the EC species category is being used. ''Stocks in the fishery'' need status determination criteria, other reference points, ACL mechanisms, and AMs; EC species would not need them.

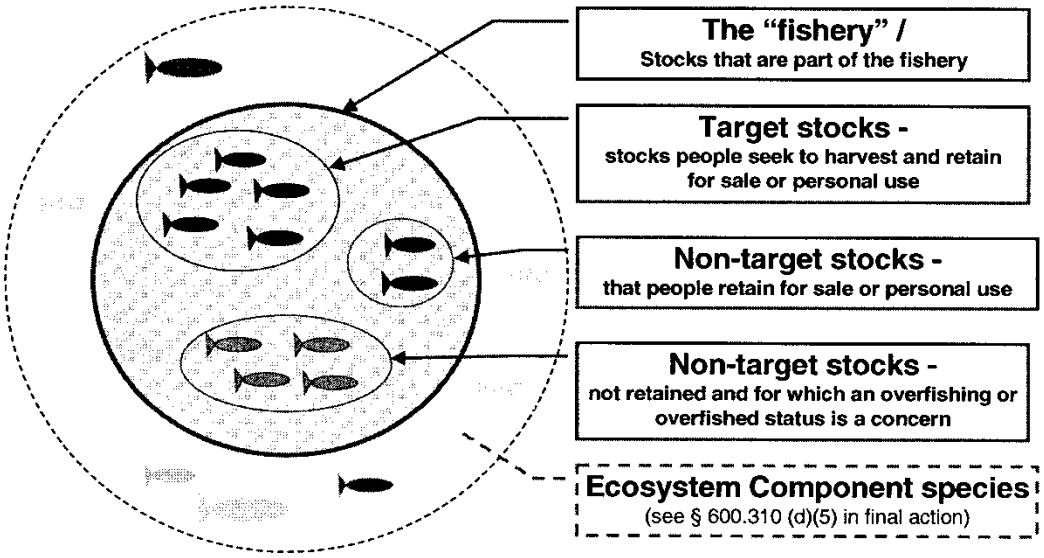

Figure 2-1: General Framework for "Stocks in the Fishery" versus "Ecosystem Component Species." This figure describes the kind of stocks or stock complexes that might fall into the two classifications, but should not be viewed as requiring FMPs to include specific species or stock complexes in their category (source: Overview of Major Aspects of the Final Action implementing National Standard 1 Guidelines revisions (74 FR 3179)

As noted previously**,** the National Standard 1 guidelines, in order to be designated as an "ecosystem component" (EC), the species or species group should be:

- a non-targeted species or species group;
- not subject to overfishing, overfished, or approaching an overfished condition;
- not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and
- not generally retained (a small amount could be retained) for sale or personal use.

These issues are addressed sequentially below for this action:

'…non-targeted species or species group; not subject to overfishing, overfished, or approaching an overfished condition; not likely to become subject to overfishing or overfished in the absence of conservation and management measures;'

While reliable biomass estimates to set biological reference points are lacking for squid species, there are observations that squids have inherently high stock productivity due to their rapid growth, maturation, and short lives, and evidence from other areas (e.g.,NEFMC 2010) suggest it is unlikely a highly productive stock could be overfished in the absence of an intensive directed fishery. Further estimates from ecosystem models indicate that the current survey biomass estimates would represent a substantial underestimate of overall biomass (Ormseth, 2015a). Untargeted, squids are unlikely to pose a conservation concern. As noted by the SSC in December 2015, 'Current levels of incidental catch in the BSAI and GOA are well below those that would pose a conservation concern, and likely much less than MSY.' Given that squids are truly an incidentally caught species with retention primarily due to full-retention requirements and processing for bait it seems unlikely that current catch

levels pose any conservation concern regardless of catch limits. Therefore squids in both the GOA and BSAI seem to meet all three of these requirements for EC.

'…not generally retained (a small amount could be retained) for sale or personal use.'

Squids are caught incidentally while fishing for groundfish in both the BSAI and GOA almost exclusively in the pollock fisheries in both areas (Table 3-6 and Table 3-7). There is no directed fishery for squids in either region and as such it is put on bycatch status from the start of the year. For example, for 2016-17 the harvest specifications note that in accordance with § 679.20(d)(1)(i), the Regional Administrator may establish a directed fishing allowance (DFA) for a species or species group if the Regional Administrator determines that any allocation or apportionment of a target species has been or will be reached. If the Regional Administrator establishes a DFA, and that allowance is or will be reached before the end of the fishing year, NMFS will prohibit directed fishing for that species or species group in the specified subarea or district (see § 697.20(d)(1)(iii)). Based on historic catch patterns and anticipated fishing activity, the Regional Administrator has annually determined that the groundfish allocation amounts in BSAI Table 20[3]and GOA Table 29[4] will be necessary as incidental catch to support other anticipated groundfish fisheries for the 2016 and 2017 fishing years. Consequently, in accordance with § 679.20(d)(1)(i), the Regional Administrator establishes the DFA for the species and species groups in Table 20 as zero. Therefore, in accordance with § 679.20(d)(1)(iii), NMFS is prohibiting directed fishing for these sectors and species in the specified areas effective at 1200 hrs, A.l.t., March 18, 2016, through 2400 hrs, A.l.t., December 31, 2017.

While caught incidentally squids are retained in fairly substantial amounts (Table 2-1). Further evaluation of whether retained squids are sold or turned into fishmeal (only) indicates that the relative proportion of retained squids processed to product types is also fairly substantial, particularly in the BSAI where it has ranged as high as 99% of retained catch in 2009. The proportion processed to product type is lower in the GOA but has still reached a high of 51% in 2005 (Table 2-2). In the first few years it was sold only as bait, but product types now being processed may include food quality products as well as bait[5]. Further information on the relative revenue stream from these products is contained in Chapter 4.6 of the RIR. **Given this information on retention and sale, it is difficult to assess to what extent squids meet the 4th requirement for EC category in either FMP.**

[3] https://alaskafisheries.noaa.gov/sites/default/files/16_17bsaitable20.pdf
[4] https://alaskafisheries.noaa.gov/sites/default/files/81fr14740.pdf
[5] Note that this is based on examining COAR production for multiple years showing squids as more than just meal and bait by multiple processors, however these data are being re-assessed as there are indications that it was mis-reported as product.

Table 2-1 Catch and retention of squids by all groundfish fisheries by FMP area BSAI and GOA (2003-2015)

	BSAI			GOA		
year	catch	retained	% retained	catch	retained	% retained
2003	1,282	912	71%	77	40	53%
2004	1,014	431	42%	157	108	69%
2005	1,186	843	71%	632	555	88%
2006	1,418	868	61%	1,516	1,280	84%
2007	1,188	689	58%	412	375	91%
2008	1,542	1,034	67%	84	75	90%
2009	360	181	50%	337	293	87%
2010	410	261	63%	131	118	90%
2011	336	144	43%	232	176	76%
2012	688	454	66%	18	2	13%
2013	299	111	37%	321	294	92%
2014	1,678	682	41%	94	55	59%
2015	2,364	1,302	55%	411	319	77%

Source: AKFIN, May 2016 Table originates from SQUID_CATCH_CONF(5-6)

Table 2-2 Proportion of AFA program (Bering Sea pollock fishery) squids retained catch that is processed to a product and sold (2006-2015). Squids retained catch from 2003-2006 includes all CV trawl targets. Note that this does not include retained catch which is processed to fishmeal.

year	proportion of retained catch processed to product	
	BSAI	GOA
2003	83%	4%
2004	92%	9%
2005	47%	51%
2006	37%	40%
2007	84%	25%
2008	50%	12%
2009	99%	16%
2010	91%	25%
2011	93%	42%
2012	57%	40%
2013	98%	44%
2014	72%	0%
2015	40%	0%

Source: AKFIN, May 2016 Table originates from SQUID_CATCH_CONF(5-6) , SQUID_EV_CONF(05-6) and SQUID_EV_CONF(05-11), SQUID_CATCH_CONF(05-12)

2.2.4 Proposed new guidelines for NS1

NMFS is currently revising the guidelines for National Standard 1, 3, and 7. The proposed rule for the revised National Standard 1 guidelines would modify the ecosystem component criteria, specifically the criteria for determining when a stock needs conservation and management. NMFS may still modify the

proposed guidelines further based on public comments so the final guidelines will not be available until NMFS publishes the final rule. NMFS anticipates publishing a final rule in the next several months.

The proposed guidelines for whether a stock needs conservation and management are the following[6]:

"600.35 (c) Stocks that require conservation and management.
(1) Magnuson-Stevens Act section 302(h)(1) requires a Council to prepare an FMP for each fishery under its authority that requires (or in other words, is in need of) conservation and management. Not every fishery requires Federal management. Any stocks that are predominately caught in Federal waters and are overfished or subject to overfishing, or likely to become overfished or subject to overfishing, are considered to require conservation and management. In addition, the following non-exhaustive list of factors should be used by a Council when deciding whether stocks require conservation and management:
(i) The stock is an important component of the marine environment.
(ii) The stock is caught by the fishery.
(iii) Whether an FMP can improve or maintain the condition of the stocks.
(iv) The stock is a target of a fishery.
(v) The stock is important to commercial, recreational, or subsistence users.
(vi) The fishery is important to the Nation and to the regional economy.
(vii) The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution.
(viii) The economic condition of a fishery and whether an FMP can produce more efficient utilization.
(ix) The needs of a developing fishery, and whether an FMP can foster orderly growth.
(x) The extent to which the fishery could be or is already adequately managed by states, by state/Federal programs, by Federal regulations pursuant to other FMPs or international commissions, or by industry self regulation, consistent with the policies and standards of the Magnuson-Stevens Act.
(2) When considering adding a new stock to an FMP or keeping an existing stock within an FMP, Councils should prepare a thorough analysis of the factors, and any additional considerations that may be relevant to the particular stock. No single factor is dispositive, but Councils should consider weighting the factors as follows. Factors in paragraphs (c)(1)(i) through (iii) of this section should be considered first, as they address maintaining a fishery resource and the marine environment. See 16 U.S.C. 1802(5)(A). These factors weigh in favor of including a stock in an FMP. Councils should next consider factors in paragraphs (c)(1)(iv) through (ix) of this section, which set forth key economic, social, and other reasons contained within the MSA for an FMP action. See 16 U.S.C. 1802(5)(B). Regardless of whether any of the first nine factors indicates a conservation and management need, a Council should consider factor in paragraph (c)(1)(x) of this section before deciding to include or maintain a stock in an FMP. In many circumstances, adequate management of a fishery by states, state/Federal programs, or another Federal FMP would weigh heavily against a Federal FMP action. See, e.g., 16 U.S.C. 1851(a)(7) and 1856(a)(3). In evaluating the above criteria, a Council should consider the specific circumstances of a fishery, based on the best scientific information available; to determine whether there are biological, economic, social and/or operational concerns that can be addressed by Federal management.
(3) Councils may choose to identify stocks within their FMPs as ecosystem component (EC) species (see § 600.310(d)(1)) if they do not require conservation and management. EC species may be identified at the species or stock level, and may be grouped into complexes. Consistent with National Standard 9, Magnuson-Stevens Fishery Conservation and Management Act (MSA)

[6] [6] https://alaskafisheries.noaa.gov/sites/default/files/80fr2786.pdf

section 303(b)(12), and other applicable MSA sections, management measures can be adopted in order to, for example, collect data on the EC species, minimize bycatch or bycatch mortality of EC species, protect the associated role of EC species in the ecosystem, or for other reasons."

2.2.5 Consideration of additional alternative management measures

In harvest specifications deliberations for 2016-2017, the SSC had the following comments regarding harvest specifications, EC considerations and potential alternative management measures to consider (SSC minutes, October 2015):

'It might be possible to depart from the precedent of estimating an OFL and focus on ensuring that specifications do not unnecessarily constrain current fisheries, while prohibiting the development of a directed squid fishery, without sufficient information to properly manage stocks. Possible options include the following:

Move squid to Ecosystem Component. This would not constrain current fisheries and would prohibit the development of a directed squid fishery since squid retention would be limited. However, this would result in squid discards, since they are generally unsuitable for making fish meal, and Ecosystem Component status potentially would disallow processing squid for bait, which could put more pressure on other bait species. If squid are moved to an Ecosystem Component, it will be important to continue tracking squid catch, retaining tools to limit squid catch if necessary (e.g., maximum retention allowance), and to explore possibilities of allowing processing of squid bycatch for bait.

Set ABC with no OFL (OFL "unknown", e.g., Atlantic deep-sea red crab fishery). Input from Council staff and NOAA General Council noted that it was unclear whether this option is feasible, and the SSC expressed discomfort with this option, as well. However, this option would not unnecessarily constrain current fisheries and could reduce discards by allowing retention of incidental squid for use as bait. This option might not prohibit the development of a directed squid fishery, unless an OFL was later implemented.

... the SSC requests clarification on whether it is possible to set an ABC with no OFL.'

The Council may wish to reconsider SSC comments, revised NS1 guidelines and rationale for moving squids into the EC category following the approved guidelines in 2016, and other potential approaches for squid management in moving forward with this analysis. For example, the Pacific Fishery Management Council recently created a "Shared EC" category that includes a number of forage fishes and all squids except for market squid (which are targeted) (PFMC, 2015).

2.3 Comparison of Alternatives

Table 2-3 provides a summary of the two alternatives, options and sub-options considered in this action. The Council did not specify that Alternative 2, Option 1 must be selected if Option 2 is selected thus it is unclear how catch accruing to an MRA would be assessed if recordkeeping and recording were not required. **The Council should clarify if Option 1 must be selected if Option 2 is selected under Alternative 2. If Alternative 2, Option 2 is not selected, the Council should provide guidance as to what constitutes directed fishing.**

Table 2-3: Summary of Management Measures in Alternative 1 and 2

Management Measure	Alt 1- No Action	Alt 2 - Ecosystem Component
Prohibit a Directed Fishery	**No** However NMFS has not opened squid to directed fishing	**Yes** prohibit directed fishing in regulations at 679.20(i)
Retention and sale	**Yes** Retention and sale allowed.	**No** Some small amount can be retained and sold. Need guidance on amount that qualifies as small.
Annual Harvest Specifications	**Yes** - annual stock assessment - TAC assessed in optimum yield	**No** - stock assessment optional (option 1 would provide for periodic assessment) - catch not assessed in optimum yield
Incidental Catch Management	**Yes** - MRA as incidental catch species = 20%	**Yes if Option 2 selected otherwise No** - MRA as incidental catch species = options for 20%, 10%, 2% - If option 2 not selected, Council must provide guidance on what % retention qualifies as 'directed fishing'
Recordkeeping and Reporting	**Yes** - require catch reporting	**Yes if Option 1 selected otherwise No** require catch reporting (option 1)

3 Environmental Assessment

There are four required components for an environmental assessment. The need for the proposal is described in Chapter 1, and the alternatives in Chapter 2. This chapter addresses the probable environmental impacts of the proposed action and alternatives. A list of agencies and persons consulted is included in Chapter 7.

This chapter evaluates the direct, indirect, and cumulative impacts of the alternatives and options on the various resource components. The socio-economic impacts of this action are described in detail in the Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis portions of this analysis (Chapters 4 and 5).

Recent and relevant information, necessary to understand the affected environment for each resource component, is summarized in the relevant section. For each resource component, the analysis identifies the potential impacts of each alternative, and uses criteria to evaluate the significance of these impacts. If significant impacts are likely to occur, preparation of an EIS is required. Although an EA should evaluate economic and socioeconomic impacts that are interrelated with natural and physical environmental effects, economic and social impacts by themselves are not sufficient to require the preparation of an EIS (see 40 CFR 1508.14).

An environmental assessment must consider cumulative effects when determining whether an action significantly affects environmental quality. The Council on Environmental Quality (CEQ) regulations for implementing NEPA define cumulative effects as:

> *"the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7*).

The concept behind cumulative effects analysis is to capture the total effects of many actions over time that would be missed if evaluating each action individually. Concurrently, the Council on Environmental Quality (CEQ) guidelines recognize that it is most practical to focus cumulative effects analysis on only those effects that are truly meaningful.

3.1 Methods

3.1.1 Documents incorporated by reference in this analysis

This EA relies heavily on the information and evaluation contained in previous environmental analyses, and these documents are incorporated by reference. The documents listed below contain information about the fishery management areas, fisheries, marine resources, ecosystem, social, and economic elements of the groundfish fisheries. They also include comprehensive analysis of the effects of the fisheries on the human environment, and are referenced in the analysis of impacts throughout this chapter.

Alaska Groundfish Harvest Specifications Final Environmental Impact Statement (NMFS 2007).

This EIS provides decision makers and the public an evaluation of the environmental, social, and economic effects of alternative harvest strategies for the federally managed groundfish fisheries in the GOA and the Bering Sea and Aleutian Islands management areas and is referenced here for an

understanding of the groundfish fishery. The EIS examines alternative harvest strategies that comply with Federal regulations, the Fishery Management Plan (FMP) for Groundfish of the GOA, the Fishery Management Plan (FMP) for Groundfish of the BSAI Management Area, and the Magnuson-Stevens Fishery Conservation and Management Act. These strategies are applied using the best available scientific information to derive the total allowable catch (TAC) estimates for the groundfish fisheries. The EIS evaluates the effects of different alternatives on target species, non-specified species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, and economic aspects of the groundfish fisheries. A Supplemental Information Report was prepared in 2016 which considers new information, and affirms that the 2016 and 2017 harvest specifications, which were set according to the preferred harvest strategy, do not constitute a change in the action; and (2) the information presented does not indicate that there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.These documents are available from https://alaskafisheries.noaa.gov/fisheries/groundfish-harvest-specs-eis.

Stock Assessment and Fishery Evaluation (SAFE) Report for the Groundfish Resources of the BSAI/GOA (NPFMC 2015a, 2015b).

Annual SAFE reports review recent research and provide estimates of the biomass of each species and other biological parameters. The SAFE report includes the acceptable biological catch (ABC) specifications used by NMFS in the annual harvest specifications. The SAFE report also summarizes available information on the ecosystems and the economic condition of the groundfish fisheries off Alaska. This document is available from http://www.afsc.noaa.gov/refm/stocks/assessments.htm.

Final Programmatic Supplemental Environmental Impact Statement (PSEIS) on the Alaska Groundfish Fisheries (NMFS 2004).

The PSEIS evaluates the Alaska groundfish fisheries management program as a whole, and includes analysis of alternative management strategies for the GOA and Bering Sea/Aleutian Islands (BSAI) groundfish fisheries. The EIS is a comprehensive evaluation of the status of the environmental components and the effects of these components on target species, non-specified species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, and economic aspects of the groundfish fisheries. A Supplemental Information Report (NPFMC and NMFS 2015) was prepared in 2015 which considers new information, and affirms that new information does not indicate that there is now a significant impact from the groundfish fisheries where the 2004 PSEIS concluded that the impact was insignificant. The PSEIS document is available from https://alaskafisheries.noaa.gov/node/33552, and the Supplemental Information Report from https://alaskafisheries.noaa.gov/sites/default/files/sir-pseis1115.pdf.

3.1.2 Resource components addressed in the analysis

Table 3-1 shows the components of the human environment and whether the proposed action and its alternatives have the potential to impact that resource component and thus require further analysis. Extensive environmental analysis on all resource components is not needed in this document because the proposed action is not anticipated to have environmental impacts on all resource components.

The effects of the alternatives on the resource components would be caused by the removal of harvest specifications for squids and the relaxation of potential constraints on the groundfish fisheries in the BSAI and GOA, particularly the pollock fisheries as the squid bycatch in the BSAI and GOA is primarily taken in the pollock fishery (e.g. 94% of squid in the BSAI is in the pollock target and 90% of squid in the GOA in 2015 in the pollock target (Ormseth 2015a, Ormseth 2015b). Thus the alternatives have the potential to affect squids, salmon, and social and economic components.

No effects are expected on marine mammals, seabirds, habitat, and the ecosystem. No effect is presumed for these components because current fishing regulations (e.g., season and gear types), harvest limits, or regulations protecting habitat and important breeding areas as described in previous NEPA documents (NMFS, 2004, NPFMC and NMFS 2015) would not be changed by any of the alternatives. No effects are presumed for marine mammals because existing protection measures would not be changed, nor would allowable harvest amounts for important prey species. The alternatives do not change the amount of pollock catch available for prosecution by the pollock fisheries in the GOA and BSAI nor the amount of squids caught annually as squids will continue to be caught incidentally similar to status quo. The relaxation of the potential constraint by moving squids into the EC category would only potentially impact squids management and the pollock fisheries responses to avoiding salmon bycatch. No change in any other groundfish fishery is anticipated as a result of this action as the pollock fisheries take over 90% of squids incidental catch in both FMPs. As a result, further analysis is included only for groundfish (squids), prohibited species (salmon and social and economic components, the only resource components which the proposed action may impact. Note that impacts to 'Ecosystem Component species' are addressed under Squid impacts as there is no expected impact to other EC species (outside of salmon which is addressed under Prohibited Species) under either Alternative 1 or 2.

Table 3-1 Resources potentially affected by the proposed action and alternatives.

Potentially affected resource component							
Groundfish	**Prohibited Species**	**Ecosystem Component Species**	**Marine Mammals**	**Seabirds**	**Habitat**	**Ecosystem**	**Social And economic**
Y-squid N-groundfish	Y-Salmon N-others	N	N	N	N	N	Y

N = no impact anticipated by each alternative on the component.
Y = an impact is possible if each alternative is implemented.

3.1.3 Methods used for the impact analysis

Data was sourced by using NMFS Alaska Region Catch Accounting System in Comprehensive_BLEND_CA, ADFG Commercial Operators Annual Report in Comprehensive_ENCOAR_PROD and ADFG/CFEC Fish Ticket in Comprehensive_FT. The Comprehensive datasets are compiled by AKFIN. Catch Accounting was utilized to show total catch and total retained amounts. Fish Tickets provided the amount of retained fish coded as fish meal, is discarded by the processor or is processed into a product other than fish meal. Ex vessel values and prices were also provided by Fish Tickets. The Commercial Operators Annual Report provided product types, amounts and values.

3.1.4 Cumulative effects analysis

This EA analyzes the cumulative effects of each alternative and the effects of past, present, and reasonably foreseeable future actions (RFFA). Based on Table 3, the resources with potentially meaningful cumulative effects are groundfish, prohibited species, ecosystem component species, and social and economic components. The cumulative effects on the other resources have been analyzed in numerous documents and the impacts of this proposed action and alternatives on those resources is minimal, therefore there is no need to conduct an additional cumulative impacts analysis.

Each section below provides a review of the relevant past, present, and RFFA that may result in cumulative effects on the resource components analyzed in this document. A complete review of the past, present, and RFFAs are described in the prior NEPA documents incorporated by reference and the

supplemental information report (SIR) NMFS prepares to annually review of the latest information since the completion of the Alaska Groundfish Harvest Specifications EIS. SIRs have been developed since 2007 and are available on the NMFS Alaska Region website. Each SIR describes changes to the groundfish fisheries and harvest specifications process, new information about environmental components that may be impacted by the groundfish fisheries, and new circumstances, including present and reasonably foreseeable future actions. NMFS reviews the reasonably foreseeable future actions described in the Harvest Specifications EIS each year to determine whether they occurred and, if they did occur, whether they would change the analysis in the Harvest Specifications EIS of the impacts of the harvest strategy on the human environment. In addition, NMFS considered whether other actions not anticipated in the Harvest Specifications EIS occurred that have a bearing on the harvest strategy or its impacts. The SIRs provide the latest review of new information regarding Alaska groundfish fisheries management and the marine environment since the development of the Harvest Specifications EIS and provide cumulative effects information applicable to the alternatives analyzed in this EA.

Actions are understood to be human actions (e.g., a designation of northern right whale critical habitat in the Pacific Ocean), as distinguished from natural events (e.g., an ecological regime shift). CEQ regulations require consideration of actions, whether taken by a government or by private persons, which are reasonably foreseeable. This requirement is interpreted to indicate actions that are more than merely possible or speculative. In addition to these actions, this cumulative effects analysis includes the effects of climate change.

Actions are considered reasonably foreseeable if some concrete step has been taken toward implementation, such as a Council recommendation or NMFS's publication of a proposed rule. Actions only "under consideration" have not generally been included, because they may change substantially or may not be adopted, and so cannot be reasonably described, predicted, or foreseen. Identification of actions likely to impact a resource component within this action's area and time frame will allow the public and Council to make a reasoned choice among alternatives.

3.2 Squids

Squids are marine molluscs in the class Cephalopoda (Group Decapodiformes). They are streamlined animals with ten appendages (2 tentacles, 8 arms) extending from the head, and lateral fins extending from the rear of the mantle. Squids are active predators which swim by jet propulsion, reaching swimming speeds up to 40 km/hr, the fastest of any aquatic invertebrate. Squids also hold the record for largest size of any invertebrate (Barnes 1987).

In the BSAI and GOA regions there are at least 15 species of squid (Table 1). The most abundant species is *Berryteuthis magister* (magistrate armhook squid; Figure 3-1). Members of these 15 species come from six families in two orders and can be found from 10 m to greater than 1500 m. All but one, *Rossia pacifica* (North Pacific bobtail squid), are pelagic but *Berryteuthis magister* and *Gonatopsis borealis* (boreopacific armhook squid) are often found in close proximity to the bottom. The vertical distribution of these three species is the probable cause of their predominance in the BSAI bottom trawl surveys relative to other squid species, although no squid species appear to be well-sampled by BSAI surveys. Most species are associated with the slope and basin, with the highest species diversity along the slope region of the Bering Sea between 200 – 1500 m. Since most of the data come from groundfish survey bottom trawls, the information on abundance and distribution of those species associated with the bottom is much more accurate than that of the pelagic species (Ormseth, 2015b).

Table 3-2 Taxonomic grouping of squid species found in the BSAI and GOA.

Class Cephalopoda; Order Oegopsida	
Family Chiroteuthidae	
Chiroteuthis calyx	
Family Cranchiidae	"glass squids"
Belonella borealis	
Galiteuthis phyllura	
Family Gonatidae	"armhook squids"
Berryteuthis anonychus	minimal armhook squid
Berryteuthis magister	magistrate armhook squid
Eogonatus tinro	
Gonatopsis borealis	boreopacific armhook squid
Gonatus berryi	Berry armhook squid
Gonatus madokai	
Gonatus middendorffi	
Gonatus onyx	clawed armhook squid
Family Onychoteuthidae	"hooked squids"
Moroteuthis robusta	robust clubhook squid
Onychoteuthis borealijaponicus	boreal clubhook squid
Class Cephalopoda; Order Sepioidea	
Rossia pacifica	North Pacific bobtail squid

Figure 3-1 *Berryteuthis magister*, the magistrate armhook or red squid.

3.2.1 Status

The life histories of squids in this area are almost entirely unknown (Ormseth, 2016b). Of all the species, only *Rossia pacifica* has benthic larvae and only members of the family Gonatidae and Cranchiidae are known to spawn in the Bering Sea region.

Life history information for BSAI squids can be inferred from data on squid species elsewhere. Relative to most groundfish, squids are highly productive, short-lived animals. They display rapid growth, patchy distribution and highly variable recruitment (O'Dor, 1998). Unlike most fish, squids may spend most of their life in a juvenile phase, maturing late in life, spawning once, and dying shortly thereafter. Many squid populations are composed of spatially segregated schools of similarly sized (and possibly related) individuals, which may migrate, forage, and spawn at different times of year over a wide geographic area (Lipinski 1998; O'Dor 1998). Most information on squids refers to *Illex* and *Loligo* species which

support commercial fisheries in temperate and tropical waters. Of North Pacific squids, life history is best described for western Pacific stocks (Arkhipkin et al., 1995; Osako and Murata, 1983).

The most commercially important squid in the north Pacific is the magistrate armhook squid, *Berryteuthis magister*. This species is distributed from southern Japan throughout the Bering Sea, Aleutian Islands, and Gulf of Alaska to the U.S. west coast as far south as Oregon (Roper et al. 1984). A study completed in 2008 investigated life history and stock structure of this species in the EBS (Drobny 2008). In the EBS, *B. magister* appear to have an approximately 1-year life cycle. *B. magister* in the EBS appear to grow and mature more quickly than their conspecifics in Russian and Japanese waters. Squid growth appears to be heavily influenced by ocean temperature (Forsythe 2004), which may account for some of the regional and temporal variability.

Populations of *B. magister* and other squids are complex, being made up of multiple cohorts spawned throughout the year. *B. magister* are dispersed during summer months in the western Bering Sea, but form large, dense schools over the continental slope between September and October. Three seasonal cohorts are identified in the region: summer-hatched, fall-hatched, and winter-hatched. Growth, maturation, and mortality rates vary between seasonal cohorts, with each cohort using the same areas for different portions of the life cycle. Juvenile and adult *B. magister* also appear to be separated vertically in the water column.

The AFSC bottom trawl surveys are directed at groundfish species, and therefore do not employ the appropriate gear or sample in the appropriate places to provide reliable biomass estimates for most squids, which are generally pelagic or, if demersal, reside off bottom. The largest biomass of squids is found at depths below 200 m (Horne and Parker-Stetter 2010). Catches of squids in the EBS shelf survey are highly variable and uncertain, and it is likely that few squid inhabit the bottom waters of the shelf (Ormseth, 2016b). The EBS slope survey, which samples the shelf break area and much deeper waters, generally catches greater numbers of squids. B. magister, G. borealis, and R. pacifica are the most common squids in the slope survey (Ormseth, 2015b). In the AI, B. magister is the only squid species captured in abundance.

Biomass estimates for the GOA have fluctuated considerably since 1984, with the 2015 biomass estimate (14,079 t) the highest ever observed (Ormseth, 2015a). The survey also almost certainly underestimates squid biomass. For example, a mass-balance ecosystem model of the GOA estimates the squid population at 369,309 t (Ormseth, 2016a).

In the GOA, the size composition of squids varies among years and tends to lack a clearly defined size mode, and mantle lengths average less than 20 cm. This is in contrast to data from the BSAI that is consistently dominated by a single size mode at ~21 cm which likely corresponds to mature or maturing adults and a secondary mode at ~7 cm that likely corresponds to juveniles of a separate seasonal cohort. Aggregate length compositions in the catch records suggest that the representation of the two modes in the annual catch (whether as a result of differences in species or age) varies among years, and that the primary mode occurs consistently at ~21 cm (Ormseth, 2015b). In the western Bering Sea the size at 50% maturity is 25 cm (Arkhipin et al. 1996), so it is likely that the fishery is capturing mature squids that may soon be spawning.

3.2.2 Squids role in the ecosystem

Squids are important components in the diets of many seabirds, fish, and marine mammals, as well as voracious predators themselves on zooplankton and larval fish (Caddy 1983, Sinclair et al. 1999). The prey and predators of squids depend on their life stage. Adult squids of many species will actively prey upon fish, squid, and crustaceans, while the larvae likely share the same prey items as larval fish,

including copepods, euphausiids, and larval fish. Adult squids will be preyed upon by marine mammals, fish, and other squid, whereas, larval and juvenile squids will be taken by fish, squid, and seabirds.

Squids are central in food webs in the AI, EBS, and GOA (Figure 3-2). Here Box size is proportional to the biomass of the group in the Gulf of Alaska, and lines between boxes indicate the strength of the flow between groups. If a group is highlighted but there is no line connecting it to squid, then the flow between those groups is less than 5% of all energy flows into or out of squid. Wider lines indicate stronger flows, for instance the strongest prey flow into squid comes from large zooplankton, followed by copepods. These food webs were derived from mass balance ecosystem models assembling information on the food habits, biomass, productivity and consumption for all major living components in each system. The EBS, AI and GOA are physically very different ecosystems, especially when viewed with respect to available squid habitat and densities (Ormseth 2011, 2012). While direct biomass estimates are unavailable for squids, ecosystem models can be used to estimate squid densities based upon the food habits and consumption rates of predators of squid. The AI has much more of its continental shelf area in close proximity to open oceanic environments where squid are found in dense aggregations, hence the squid density as estimated by predator demand in each system is much greater in the AI relative to the EBS and GOA (Figure 3-2).

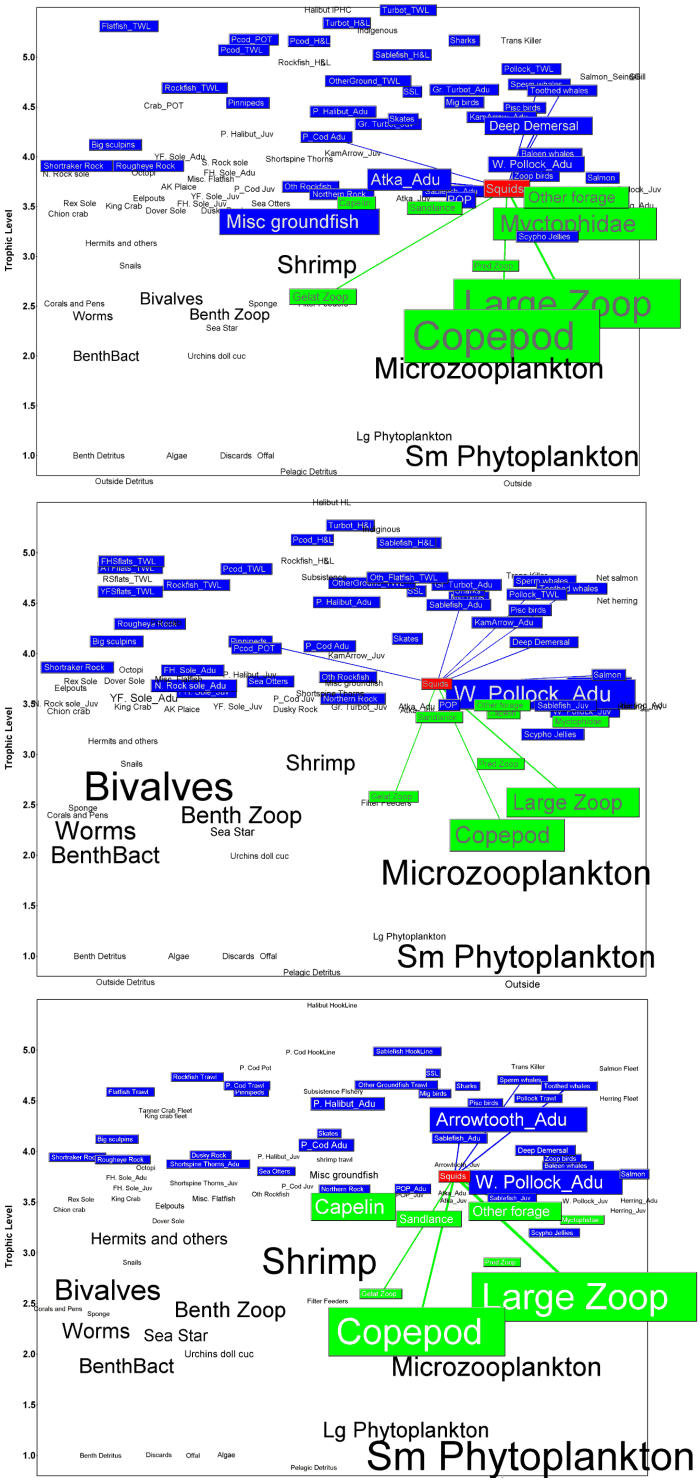

Figure 3-2 AI (top), EBS (middle), GOA (bottom) food webs of squids (red), predators (blue), and prey (green). From Ormseth, 2011 and Ormseth 2012.

In contrast with predation mortality, estimated fishing mortality on squids is similarly low in all three ecosystems. Figure 3-2 demonstrates the estimated proportions of total squid mortality attributable to fishing vs. predation, according to food web models built based on early 1990's information from the AI, EBS, and the GOA. Fishing mortality is so low relative to predation mortality that it is not visible in the plot, suggesting that current levels of overall fishery bycatch may be insignificant relative to predation mortality on squid populations (Ormseth 2011, 2012).

Many squid populations are composed of spatially segregated schools of similarly sized (and possibly related) individuals, which may migrate, forage, and spawn at different times of year (Lipinski 1998). The timing and location of fishery interactions with squid spawning aggregations may affect the availability of squid as prey for other animals as well as the age, size, and genetic structure of the squid populations themselves (Caddy 1983, O'Dor 1998). The assessment author has continually noted that "local-scale patterns of squid removals should still be monitored to ensure that fishing operations minimize impacts to both squid and their predators."(Ormseth 2011, 2012)

3.2.3 Harvest specifications

Squids are a Tier 6 species for setting harvest specifications in both the GOA and the BSAI. For the reasons described in section 3.2.1 reliable biomass estimates do not exist for squids thus information on average catch is used to establish OFL and ABC levels. The assessment author provided alternative approaches employing biomass-based estimates (as a minimum estimate, i.e., substantially underestimating the 'true' biomass) in 2015, but the plan teams and SSC have not recommended their use in establishing specifications due to the large uncertainty in these estimates.

For the BSAI, the harvest recommendations for BSAI squids had been made based on the average catch from 1978-1995. This approach was reviewed several times between 2010 and 2015, including by the Center for Independent Experts. While it is problematic, mainly because incidental catches are unlikely to reflect a sustainable level of fishing removals, the consensus has been that it is a precautionary harvest strategy: the OFL is likely to be much higher than the current harvest specifications. However due to the situation in 2015 with catches exceeding the ABC (see section 3.2.4 below), and after considering a range of alternative approaches outlined in Ormseth, 2015b, the Plan Team and SSC recommended an alternative set of years (1977-1981) leading to an OFL of 6,912 t and an ABC of 5,184 t; = 0.75*6,912 t) for use in 2016-2017. This OFL and ABC were considerably higher than ones recommended and in specifications in previous years (Table 3-6).

In the GOA, when squids in the GOA were separated from the "Other Species" group in 2011, a decision was made to make harvest recommendations for squids based on the maximum catch from 1997-2007 (i.e. OFL = maximum catch 1997-2007). While this approach is also problematic, mainly because incidental catches are unlikely to reflect a sustainable level of fishing removals, the consensus has been that it is a precautionary harvest strategy: the OFL is likely to be much higher than the current harvest specifications. This leads to an OFL of 1,530 t and an ABC of 1,148 t for use in 2016-2017. This approach has been employed since 2011.

3.2.4 Targeting, Catch, and Retention of Squids

Squids are caught incidentally in prosecution of groundfish fisheries in the BSAI and GOA. Table 3-3 and Table 3-4 show the overall catch of squids by groundfish targets. In both the BSAI and GOA, almost the entire incidental catch of squids is in the pollock fisheries. Catch of squids in all other targets is minimal.

Table 3-3 2003-2015 total tons of squid catch by target fishery BSAI.

Target	catch	retained	% retained
Alaska Plaice	0	0	0%
Arrowtooth Flounder	563	6	1%
Atka Mackerel	184	4	2%
Flathead Sole	9	0	2%
Greenland Turbot	38	1	1%
Kamchatka Flounder	254	1	0%
Other Flatfish	17		0%
Pacific Cod	21	1	4%
Pollock - bottom	4,431	3,457	78%
Pollock - midwater	8,001	4,486	56%
Rock Sole	1		0%
Rockfish	345	2	1%
Sablefish	2	0	7%
Yellowfin Sole	3	0	0%
BSAI Total	13,870	7,958	57%

Source: AKFIN, May 2016 Table originates from SQUID_CATCH_CONF(5-6)

Table 3-4 2003-2015 total tons of squid catch by target fishery GOA.

Target	catch	retained	% retained
Arrowtooth Flounder	133	2	1%
Atka Mackerel	0		0%
Deep Water Flatfish	2	0	10%
Flathead Sole	3	0	5%
Halibut	0		0%
Pacific Cod	18	4	22%
Pollock - bottom	2,529	2,276	90%
Pollock - midwater	1,749	1,497	86%
Rex Sole	10	0	3%
Rockfish	140	5	3%
Sablefish	10	0	1%
Shallow Water Flatfish	2	0	4%
GOA Total	4,594	3,785	82%

Source: AKFIN, May 2016 Table originates from SQUID_CATCH_CONF(5-6)

Incidental catch of squids in the pollock fishery is concentrated in certain months of the year, largely consistent with the operations of the pollock fisheries in both regions. In the GOA, catch is almost exclusively in the inshore CV sector and primarily occurs in February and March (Table 3-5). In the GOA directed fishing for pollock is only open for the inshore sector. For the BSAI some catch occurs in the offshore section in February and March, but the majority of catch is in the inshore sector between July and September. In the BSAI, directed fishing for pollock is prohibited inside the Catcher Vessel Operational Area during the B season (June 10 to November 1) for catcher/processors authorized to fish for BSAI pollock, unless it is directed fishing for pollock CDQ.

Table 3-5 2003-2015 total tons of squids catch in the pollock fishery by month and sector

	BSAI			GOA		
Month	CV	CP	Total	CV	CP	Total
Jan	31	14	45	53		53
Feb	139	1,348	1,487	874	7	881
Mar	79	912	991	2,980	4	2,984
Apr	5	26	31	114	10	124
May	1	373	374	9	7	16
Jun	1,319	452	1,771	3	4	7
Jul	2,680	826	3,506	7	88	95
Aug	2,560	313	2,873	21	30	51
Sep	1,425	574	1,999	94	16	110
Oct	600	126	726	256	7	263
Nov	3	61	64	8	3	11
Dec		4	4	0		0
Total	8,843	5,028	13,871	4,418	176	4,594

Source: AKFIN, May 2016 Table originates from SQUID_CATCH_CONF(5-6)

Figure 3-3 through Figure 3-7 show panels of pollock catch and squid catch concentrations from 2011-2015. These years are selected because operational changes in the pollock fleet since 2011 for Chinook salmon avoidance make these years more comparable for spatial behavior in the fleet than years prior. In the BSAI, the majority of catches occur in the Bering Canyon region of the southeastern Bering Sea, and is concentrated in the southeastern portion of NMFS Area 517 and Area 519 (Figure 3-3 through Figure 3-7). In the EBS, the distribution of squid catch appears to have remained fairly constant over time. While squids were caught throughout the EBS slope, the outer domain of the EBS shelf, and the Aleutian Islands, the highest catches consistently occurred near the major canyons ((Figure 3-3 through Figure 3-7). A survey conducted in 2009 in the Bering Canyon region suggested that the density of *B. magister* increases considerably below 200 m (Horne and Parker-Stetter 2010). This is supported by the depth distribution of *B. magister* in the AI trawl survey. Incidental catches of squids may thus increase when fishing activity occurs at greater depths. Cumulative squid catch in relation to pollock catch by week in the EBS pollock fishery for 2014-2015 is shown in Figure 3-8. The majority of catches occur in July near the start of the pollock B season.

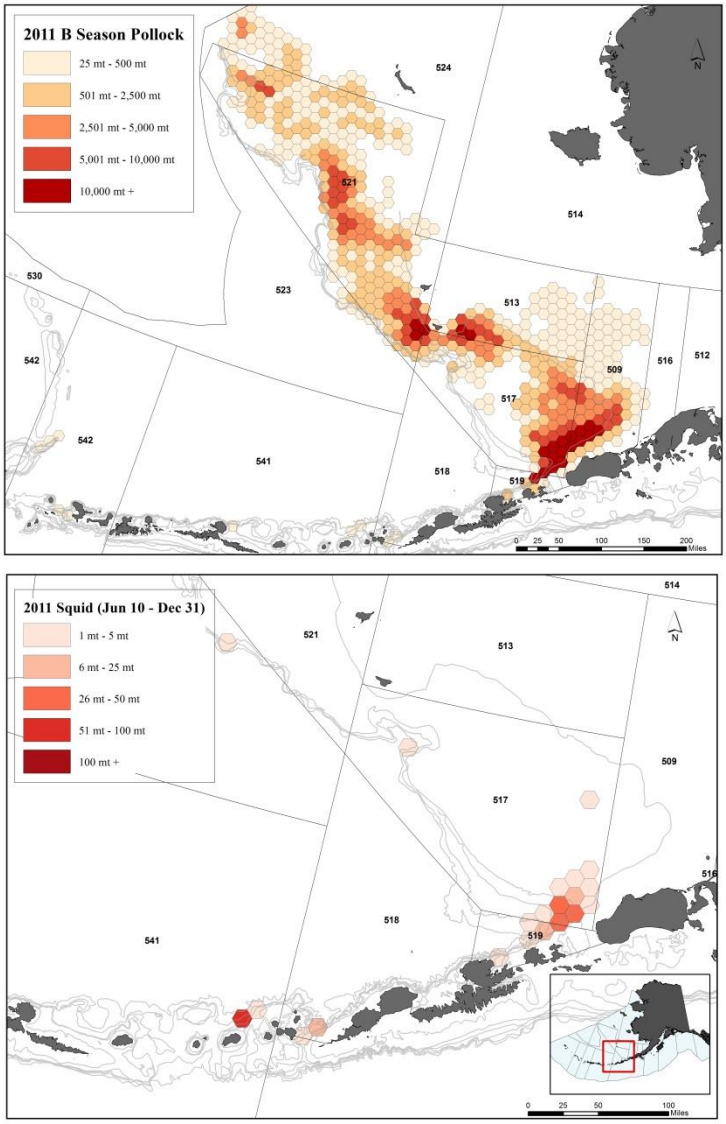

Figure 3-3 B-season Pollock catch (top panel) and Squid catch (bottom panel) by EBS pollock fleet in 2011. Note 2011 was the first year of implementation of a new program to address Chinook salmon bycatch in the EBS pollock fishery.

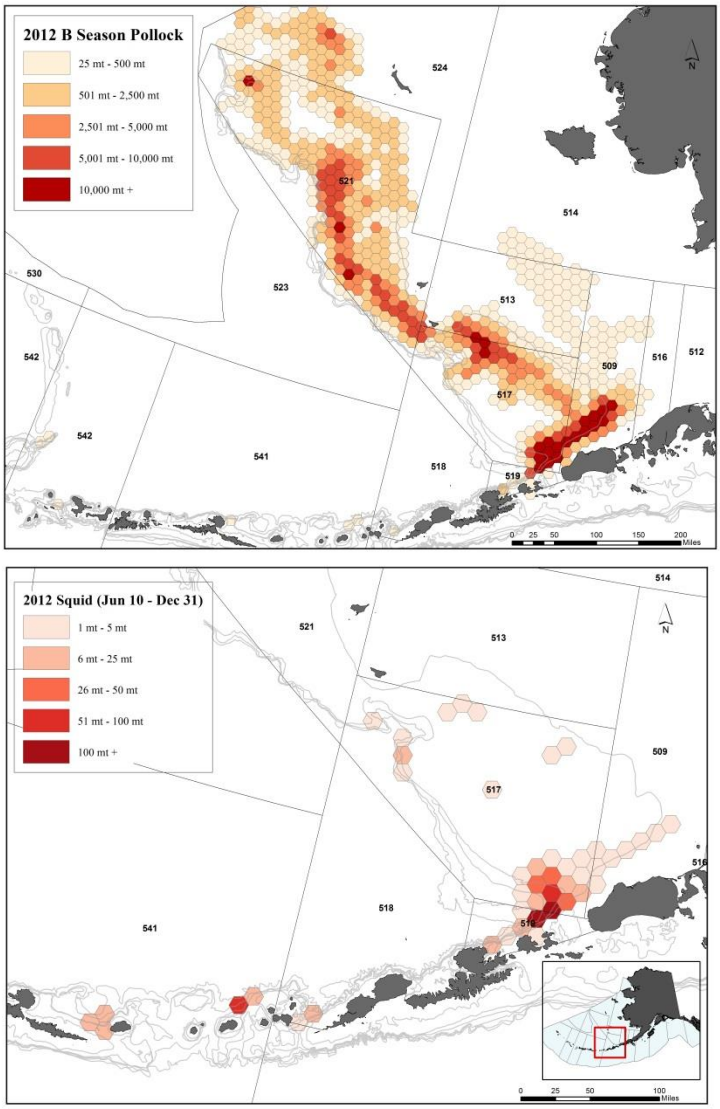

Figure 3-4 B-season Pollock catch (top panel) and Squid catch (bottom panel) by EBS pollock fleet in 2012

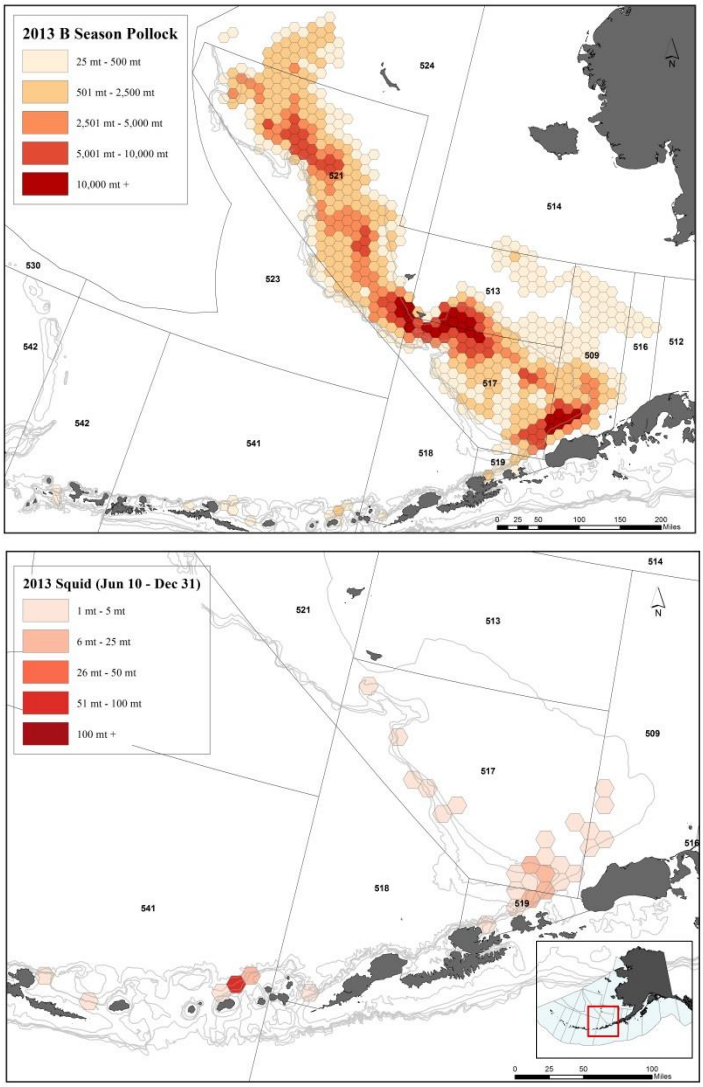

Figure 3-5 B-season Pollock catch (top panel) and Squid catch (bottom panel) by EBS pollock fleet in 2013.

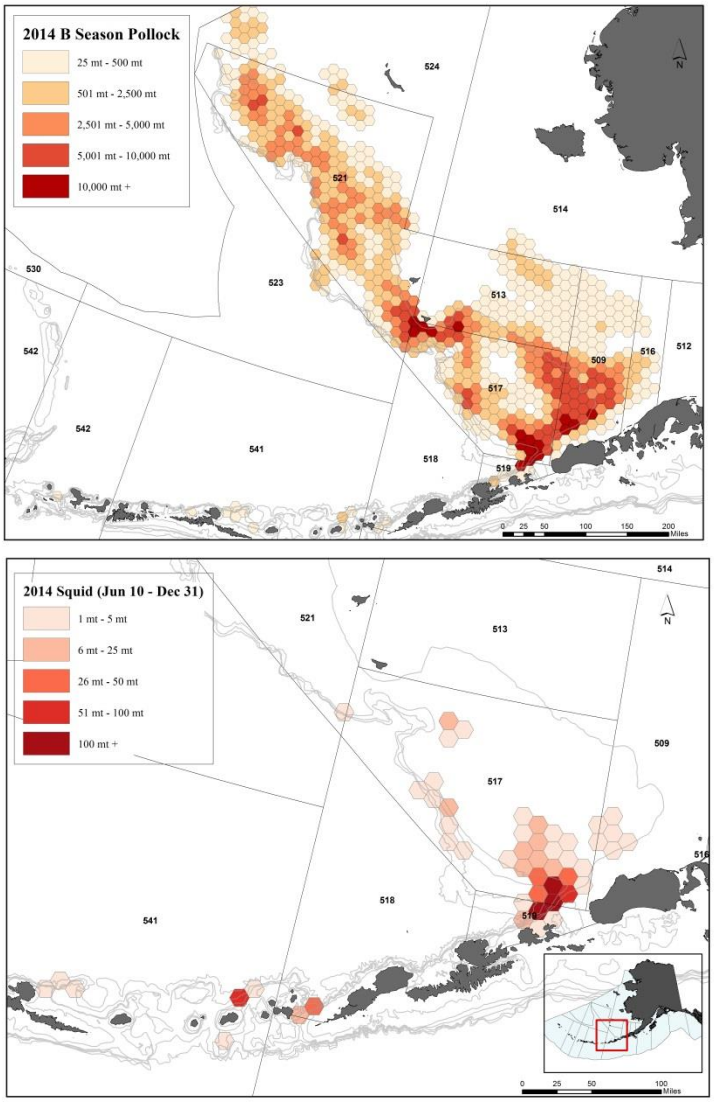

Figure 3-6 B-season Pollock catch (top panel) and Squid catch (bottom panel) by EBS pollock fleet in 2014

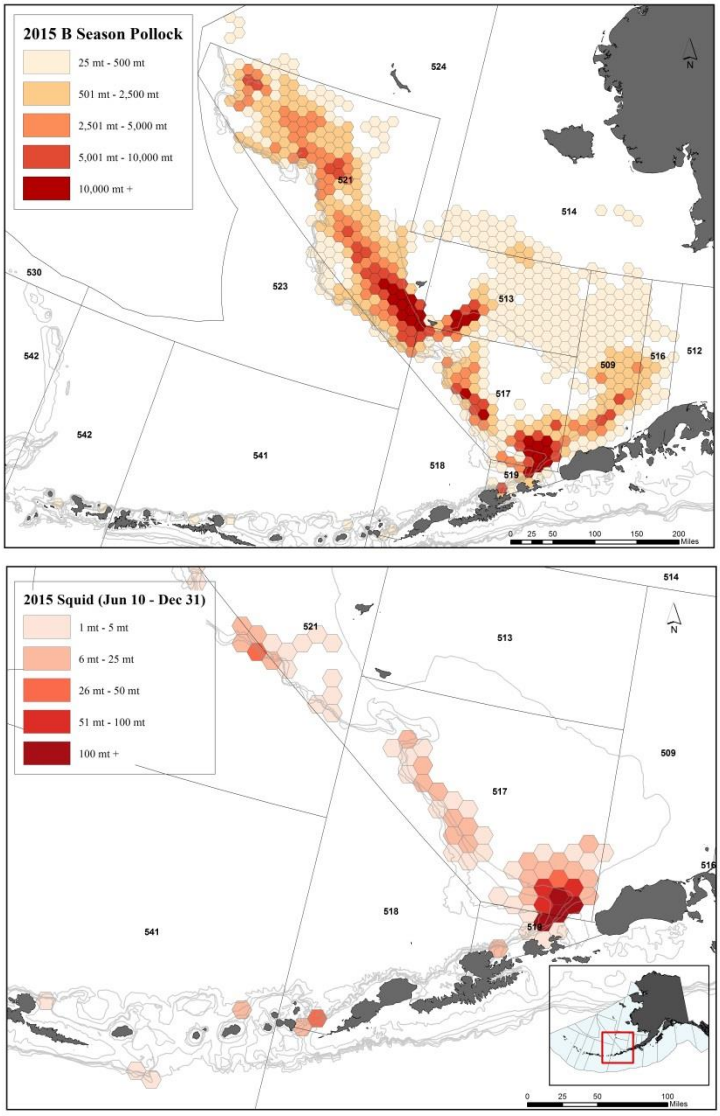

Figure 3-7 B-season Pollock catch (top panel) and Squid catch (bottom panel) by EBS pollock fleet in 2015

In the BSAI, the squids TAC is usually set at a level estimated to meet incidental catch needs in the groundfish fisheries. However squids catch in many years has exceeded the original TAC set by the Council (Table 3-6) and additional catch from the non-specified reserve has been reallocated to squids (See section 4.7 for additional information on how NMFS management re-specifies catch levels to adjust the TAC). In 2010 the TAC was set at a lower level as incidental catch in previous years had been low and the TAC was used to 'fund' other groundfish fisheries that would otherwise be unfunded due to the constraint from the 2 million ton OY cap. Incidental catch levels rose from 2012 on, requiring a reallocation from the non-specified reserve (Table 3-6).

In 2015 notably, catch exceeded the ABC for the first time historically and was approaching the OFL. NMFS in-season management has the authority to close areas of high catch which covers a portion of Areas 519 and 517 as catch approaches the OFL to preclude exceeding it and closing down other fisheries. However the pollock fleet has voluntarily enacted a similar closure in years where squid catch is elevated and moves the fleet out of their squid closure area (squid box) prior to NMFS taking action (Table 3-6). In years where a closure by the pollock fleet is not listed, frequently the fleet has been

notified previously by SeaState that catch is becoming high in the region and they move from that area anyways thus the notation of closure or non-closure in Table 3-6 does not provide all of the information regarding the fleet's avoidance measures to reduce catch. As noted in section 3.3.2, the fleet frequently must balance moving the fleet from the squid closure area with resulting increased catch of chum salmon, Chinook salmon, and herring. Also, the pollock fishing can be better (larger fish, higher CPUE) in the area of high squid catch.

Table 3-6 BSAI Squid Catch, TAC, associated NMFS AKRO management measures and years in which the SeaState closure was enacted

Year	Catch	Council TAC	ITAC (minus 15% reserve	Released non-specified reserve	Final TAC	ABC	Final TAC Remaining	ABC Remaining	Final TAC increase over Council TAC?	SeaState Closure?
2003	1,282	1,970	1,675	-	1,675	1,970	393	688	None	
2004	1,014	1,275	1,084	-	1,084	1,970	70	956	None	
2005	1,186	1,275	1,084	100	1,184	1,970	(2)	784	None	
2006	1,418	1,275	1,084	-	1,084	1,970	(334)	552	None	Yes
2007	1,188	1,970	1,675	-	1,675	1,970	487	782	None	
2008	1,542	1,970	1,675	-	1,675	1,970	133	428	None	
2009	360	1,970	1,675	-	1,675	1,970	1,315	1,610	None	
2010	410	1,970	1,675	-	1,675	1,970	1,265	1,560	None	
2011	336	425	361	-	361	1,970	25	1,634	None	
2012	688	425	361	339	700	1,970	12	1,282	275	
2013	299	700	595	-	595	1,970	296	1,671	None	
2014	1,678	310	264	1,500	1,764	1,970	86	292	1,454	
2015	2,364	400	340	1,630	1,970	1,970	(394)	(394)	1,570	Yes
2016	114	1,500	1,275			5,184				

Source NMFS AKRO 2016 catch through May 7, 2016

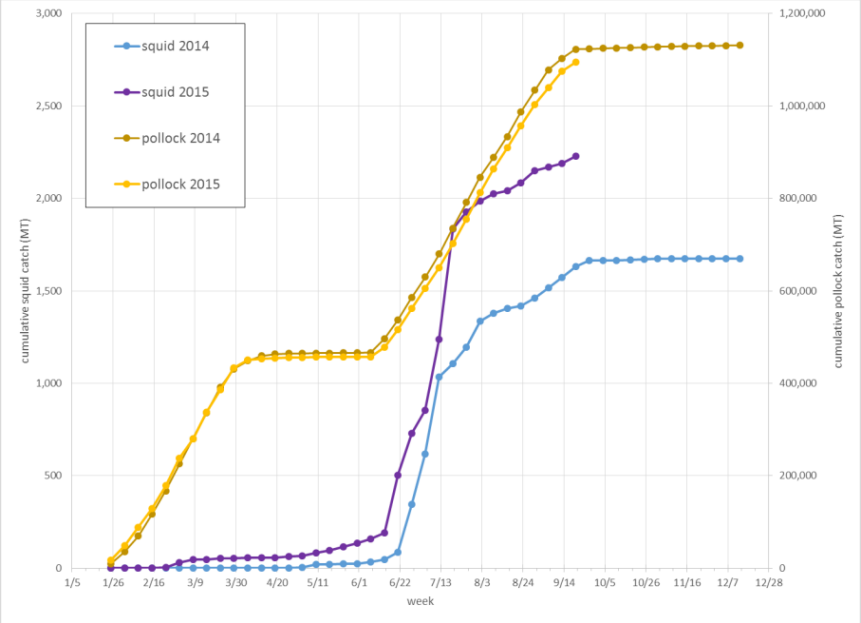

Figure 3-8 Cumulative catch of squids and pollock in the BSAI by week, 2014 & 2015 (from Ormseth, 2016b).

In the GOA, TAC-levels are also set to meet incidental catch needs (Table 3-7). Since 2006 when an unusually high catch of squids occurred, squid catches have been low in relation to the TAC. Nearly all of this catch occurs in the pollock fishery (Table 3-4), and is concentrated in Shelikof Strait where the fishery is more concentrated (Figure 3-9). In contrast to the BSAI, catch levels have not exceeded the TAC and no additional management measures have been enacted by NMFS or the pollock fleet.

Table 3-7 GOA squid catch and TAC 2003-2016*. Note TAC for 2003-2010 was for the 'other species' complex.

YEAR	Catch	TAC
2003	77	11,260
2004	157	12,942
2005	632	13,871
2006	1,516	13,856
2007	412	4,500
2008	84	4,500
2009	337	4,500
2010	131	4,500
2011	232	1,148
2012	18	1,148
2013	321	1,148
2014	94	1,148
2015	411	1,148
2016	172	1,148

Source NMFS AKRO, 2016 catch through May 7, 2016

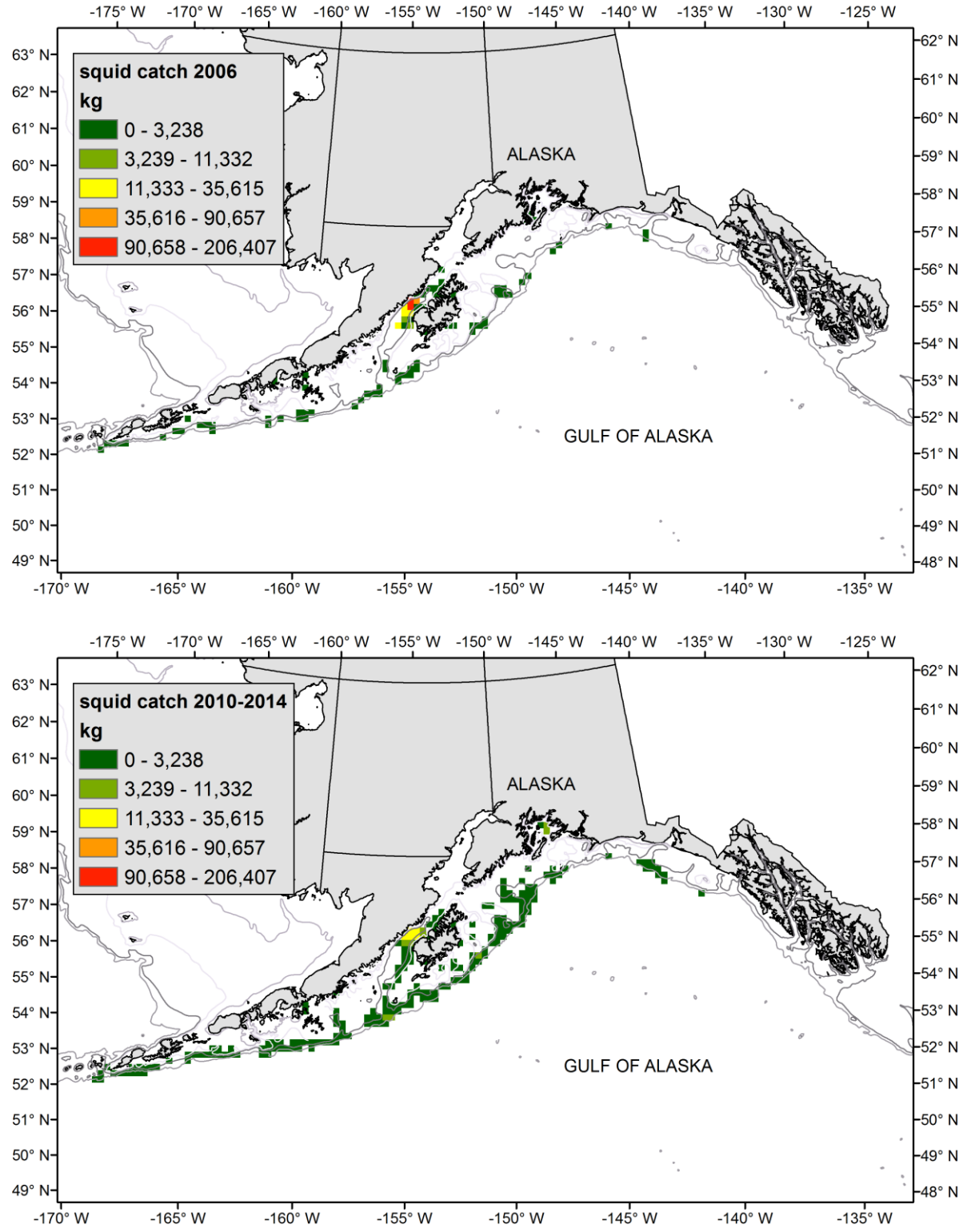

Figure 3-9 Distribution of squid catches in the GOA in 2006 (top panel) and during 2010-2014 (bottom panel). Data are total catch per 20 km x 20 km grid cell. (From Ormseth, 2016a)

3.2.5 Effects of the Alternatives on Squids

Squids are assessed annually in the GOA SAFE report (Ormseth, 2016a), the BSAI SAFE (Ormseth, 2016b) and were also evaluated in the Alaska Groundfish Fisheries Harvest Specifications EIS (NMFS 2007a). Table 3-8 describes the criteria used to determine whether the impacts on squid stocks are likely to be significant.

Table 3-8 Criteria used to determine significance of effects on target groundfish stocks.

Effect	Criteria			
	Significantly Negative	**Insignificant**	**Significantly Positive**	**Unknown**
Fishing mortality	Changes in fishing mortality are expected to jeopardize the stock's ability to sustain itself.	Changes in fishing mortality are expected to maintain the stock's ability to sustain itself.	Changes in fishing mortality are expected to enhance the stock's ability to sustain itself.	Magnitude and/or direction of effects are unknown.
Spatial or temporal distribution	Reasonably expected to adversely affect the distribution of squid either spatially or temporally such that it jeopardizes the ability of the stock to sustain itself.	Unlikely to affect the distribution of squid either spatially or temporally such that it has an effect on the ability of the stock to sustain itself.	Reasonably expected to positively affect the squid through spatial or temporal increases in abundance such that it enhances the ability of the stock to sustain itself.	Magnitude and/or direction of effects are unknown.

Impacts to squid species under Alternative 1:

As noted in section 3.2.1, squids have short, sometimes less than 1 year life-spans, limited life-history information exists and there are no reliable biomass estimates. Botom trawl survey biomass estimates are considered substantial underestimates of true biomass in both the BSAI and GOA. Squids are important prey species and food web models have indicated substantially higher biomass of squid than any of the trawl survey biomass estimates based on their role in the ecosystem. Use of food web models gives an indication of the relative impact of fishing mortality as compared with predation mortality on squids (Figure 3-2, section 3.2.2) and as noted fishing mortality is extremely low compared with the estimated predation mortality (Ormseth 2011, 2012). Therefore the current fishing mortality is considered insignificant at a population level to affect the squid stock status under either FMP.

The spatial and temporal distribution of squids is variable, and as discussed in Section 3.2.2, on a local-scale removals should be monitored to ensure that impacts spatially and temporally are minimized. There is some potential for localized depletion in specific areas where squids catch is concentrated. However, while this may affect a cohort spatially and temporally in a discreet area, this is not thought to have a population affect on squid as a whole. Therefore spatial and temporal effects under status quo on squids are also considered insignificant.

Table 3-9 provides an overview of these two factors and their interpretation and evaluation to assess the impacts of alternative 1 on squid populations relative to the significance criteria in **Table** 3-8. This table is modified from information contained in the ecosystem considerations sections of BSAI and GOA squid stock assessments (Ormseth 2011, 2012).

Table 3-9 Impacts on squids and evaluation of overall impacts to squids related to Alternative 1 squids incidental catch (excerpted from Omseth, 2011, 2012).

Groundfish fishery effects of squids catch

Indicator	Observation	Interpretation	Evaluation
Incidental catch of squid	Stable, generally <100 tons annually except for 2005, 2006, and 2007 (GOA) and < 1000 tons except for 2000-2007 and 2014-2015(BSAI)	Extremely small relative to estimated predation on squids	No concern on a population level.
Fishery concentration in space and time	Catch of squid is mostly in shelf break and canyon areas, no matter what the overall distribution of the pollock fishery is	Potential impact to spatially segregated squid cohorts and squid predators	Possible concern for localized depletion but not on a population level.

Impacts to squids under Alternative 2:

Alternative 2 would neither decrease nor substantially increase the incidental catch of squid in groundfish fisheries as squid do not appear to be targeted in any way, thus catch is likely truly incidental. It is likely that catch would be similar to status quo under Alternative 2, particularly in the GOA. Some additional catch may occur in the EBS pollock fleet as the incentive to move off high squid catch (in the absence of an MRA) would be decreased. The options for MRAs include a 2% (suboption1), 10% (suboption 2) and 20% MRA (status quo).

Under Alternative 2, if Option 2 is not selected, the Council would need to identify what is considered to be directed fishing, as it is a requirement of the EC that a species is not targeted. There is the potential that there is some on-going avoidance currently and that current incidental catch rates are not representative of intrinsic rates. Thus, in the absence of an MRA or with a higher MRA than status quo that squid catch could be higher than currently observed.

There exists the potential for increased catch in the BSAI potentially if Alternative 2 is adopted and management measures by the pollock fleet were to change such that SeaState stopped issuing notifications of high squid area and/or closures of the squid box. Under those circumstances, and with no MRA in place, the fleet would have no incentive to move from good pollock fishing grounds with low salmon bycatch and high squid bycatch. For example, Figure 3-10 below, shows the squids catch by week with pollock in 2014 and 2015. The majority of the squids catch came in a very short period of time in July and was highly concentrated in Bering Canyon (Figure 3-6 and Figure 3-7). Squid catch dropped off following the peaks in both years likely due to voluntary measures by the pollock fleet to move away from high concentrations. There is some potential for increased localized depletion in that area if the fleet had continued to catch squids rather than moving away from the region based on SeaState notifications (2014) and closure (2015).

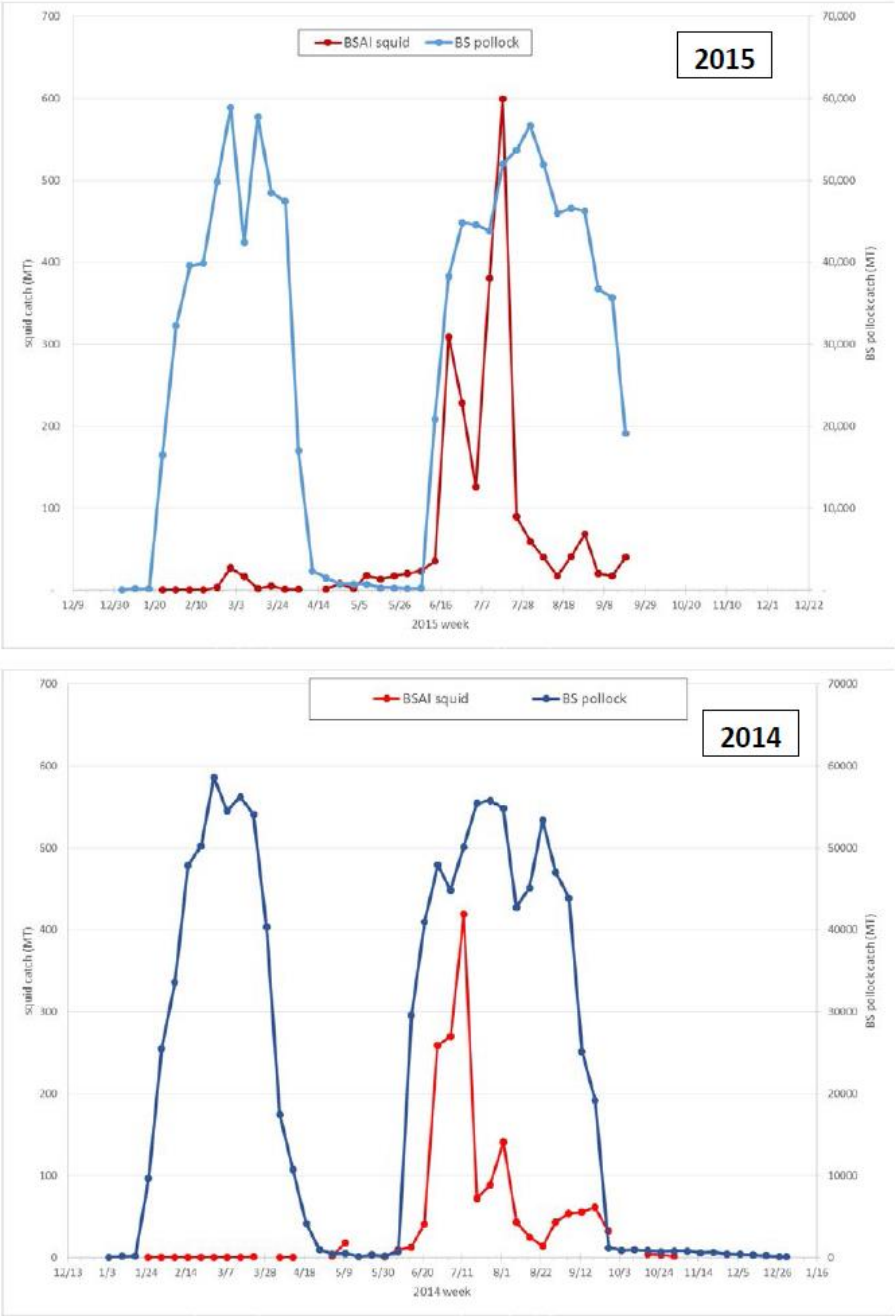

Figure 3-10 BSAI squid catch in the pollock target and related pollock catch by week-ending date in 2014 and 2015.

There remains a possibility that fisheries may cause localized depletions of squid prey fields. Predation on squids is not well understood, particularly because the size of squids (and therefore the age and species) that are preyed upon is very uncertain. Northern fur seals from St. George and Bogoslof Islands consume a large amount of squids, but it appears that most of these are small (either juveniles or smaller species) relative to adult Berryteuthis magister that are the main species caught as bycatch. However while the

potential exists, there is as yet no evidence that exists of localized depletions. Fur seal diets vary by area, but heavily-targeted pollock are the most prevalent diet item in all areas.

Option 1

Alternative 2, Option 1 would provide for continued recordkeeping and reporting of squid catches as well as a periodically updated stock assessment. NMFS in-season management already monitors squid catches in the Catch Accounting System (CAS) thus there is no additional burden to continue to monitor and report squid catches. An annual stock assessment is produced with additional information added in survey "off-years" consistent with stock assessment protocols for all other stocks in the BSAI and GOA FMPs. If Option 1 were selected the Council could specify that rather than producing an Executive Summary assessment for squids in survey 'on' years that the stock assessments for each area be produced biennially in survey "off" years. This would be consistent with current protocols for Forage Fish assessments and for Grenadiers which are also in the EC in both FMPs.

Option 2

Alternative 2 Option 2 would manage squids in the EC under an MRA. The options for MRAs include a 2% (suboption 1), 10% (suboption 2) and 20% MRA (status quo). Table 3-10 provides the percentage range of squid in the pollock target by haul in the GOA and BSAI from 2013-2015. While the majority of the hauls are less than 2% squid there are a substantial number of hauls greater than 2% thus suboption 1 has the potential to be highly constraining. Likewise many hauls are greater than 10% which also has the potential to be constraining. While a limited number of hauls are greater than 20%, some of the hauls in that category range as high as 49% squid. Thus even the 20% MRA under status quo can be constraining. For CVs in the GOA, it is difficult to separate squids from the pollock catch to avoid reaching a contraining MRA. Likewise full retention requirements on CVs in the EBS pollock fishery prevent the sorting of catch at sea. In the absence of an MRA there would be no disincentive to continuing to catch squids locally in high numbers in either area. As the Council did not explicitly specify that Option 1 be selected if Option 2 is selected, some direction would be necessary under this circumstance in order to estimate compliance with the MRA.

Table 3-10 Number of hauls in the pollock target with squid catch as a proportion of pollock catch by area (2013-2015)

Percentage range of squid in pollock catch by haul	Number of hauls (2013-2015) by FMP area	
PCT	BSAI	GOA
0-2%	41,927	1,895
2-4%	206	23
4-6%	78	8
6-8%	50	6
8-10%	24	2
10-12%	17	
12-14%	6	2
14-16%	7	1
16-18%	3	
18-20%	5	1
>20%	15	2
Grand Total	42,338	1,940

Source: AKFIN, May 2016 Table originates from Squid_Haul_Conf(05-10)

As noted in Section 4.7, exceeding the current 20% MRA for squids has resulted in some enforcement considerations and this would likely be more common under the more constraining MRA options. It is

not clear that there is any conservation benefit to a constraining MRA when squids are not being targeted and with the assumption of 100% mortality in the squid catch. Thus any constraining MRA is most likely to simply increase discards of dead squid rather than discourage targeting.

Cumulative Effects on Squid Species

The following RFFAs are identified as likely to have an impact on squid species within the action area and timeframe. Amendment 110 to the BSAI FMP when finalized will modify how Chinook and chum salmon PSC are managed which impacts behavior in the EBS pollock fleet. One aspect of Amendment 110 moves chum salmon PSC management into the Incentive Plan Agreements which should allow for some additional flexibility in the designation of chum salmon closures which could have some associated affect on squid catch. Another provision would allow for an additional 5% of the pollock TAC to be taken in the A-season if fishing conditions are good and Chinook salmon bycatch is low. This would reduce some fishing pressure in the B-season and could also alleviate some of the incidental catch of squids. The Council is also considering modified management of trawl fisheries in the GOA which would change the behavior of the trawl fleet and could also have some minor affect on the incidental catch of squid. Annual specifications changes for pollock in both the BSAI and GOA can also potentially affect squid catch.

Considering the direct and indirect impacts of the proposed action when added to the impacts of past and present actions previously analyzed in other documents that are incorporated by reference and the impacts of the reasonably foreseeable future actions listed above, the cumulative impacts of the proposed action are determined to be not significant.

3.3 Prohibited species

The only prohibited species that are likely to be affected by the proposed action are limited to Chinook and chum salmon species in the BSAI and GOA. Of those, the focus is more on the BSAI as that is where squid catch has historically been a potential constraint on the EBS pollock fishery and impacted their ability to move away form areas of higher salmon PSC. Thus this section focusses primarily on the EBS pollock fishery impacts to Chinook and chum PSC.

3.3.1 Status

Western Alaska Chinook salmon stocks are in a period of extremely low abundance, and further reductions of all sources of mortality are being consistently considered. The Bering Sea pollock fishery catches substantial numbers of Chinook salmon in both A and B seasons in some years, although recent levels are much lower than historical bycatch levels. Genetic information indicates that the majority (~65%) of the Chinook salmon caught in the Bering Sea pollock fishery originate from a single geographic region encompassing several western Alaskan rivers, including a genetically distinct group from the Canadian portion of the Yukon River.

Chum salmon stocks in Alaska are generally at higher abundance than historical periods with some stocks in Norton Sound still in decline. The EBS pollock fishery catches chum salmon predominantly in the B-season. Genetic information indicates that the majority of the chum salmon caught in the pollock fishery are of Asian –origin (~60%), while over one-fifth (~21%) originate from aggregate streams in western Alaska. The pollock fishery has caught large numbers of chum PSC historically (~700,000 in 2005), with levels in recent years quite variable. Catch in 2015 was ~200,000, with approximately 40,000 of Western Alaska origin.

3.3.2 Effects of the Alternatives on prohibited species

Table 3-11 describes the criteria used to determine whether the impacts on Chinook and chum salmon stocks are likely to be significant.

Table 3-11 Criteria used to estimate the significance of impacts on incidental catch of Chinook and chum salmon.

No impact	No incidental take of the prohibited species in question.
Adverse impact	There are incidental takes of the prohibited species in question
Beneficial impact	Natural at-sea mortality of the prohibited species in question would be reduced — perhaps by the harvest of a predator or by the harvest of a species that competes for prey.
Significantly adverse impact	An action that diminishes protections afforded to prohibited species in the groundfish fisheries.
Significantly beneficial impact	No benchmarks are available for significantly beneficial impact of the groundfish fishery on the prohibited species, and significantly beneficial impacts are not defined for these species.
Unknown impact	Not applicable

Chinook and Chum salmon PSC are taken in the BSAI and GOA pollock fishery. Highest amounts are taken in the EBS pollock fishery (Figure 3-11). For Chinook PSC, catch in 2015 was 18,329 with catch to date (May 14, 2016) in 2016 at 16,817 (Figure 3-11). In the GOA for chum salmon PSC catch in 2015 across all trawl fisheries was 1,320 with catch to date (May 14, 2016) at 158. For Chinook salmon PSC in the GOA, catch in 2015 across trawl fisheries was 18,939 and catch to date in 2016 (May 14, 2016) at 3,711.

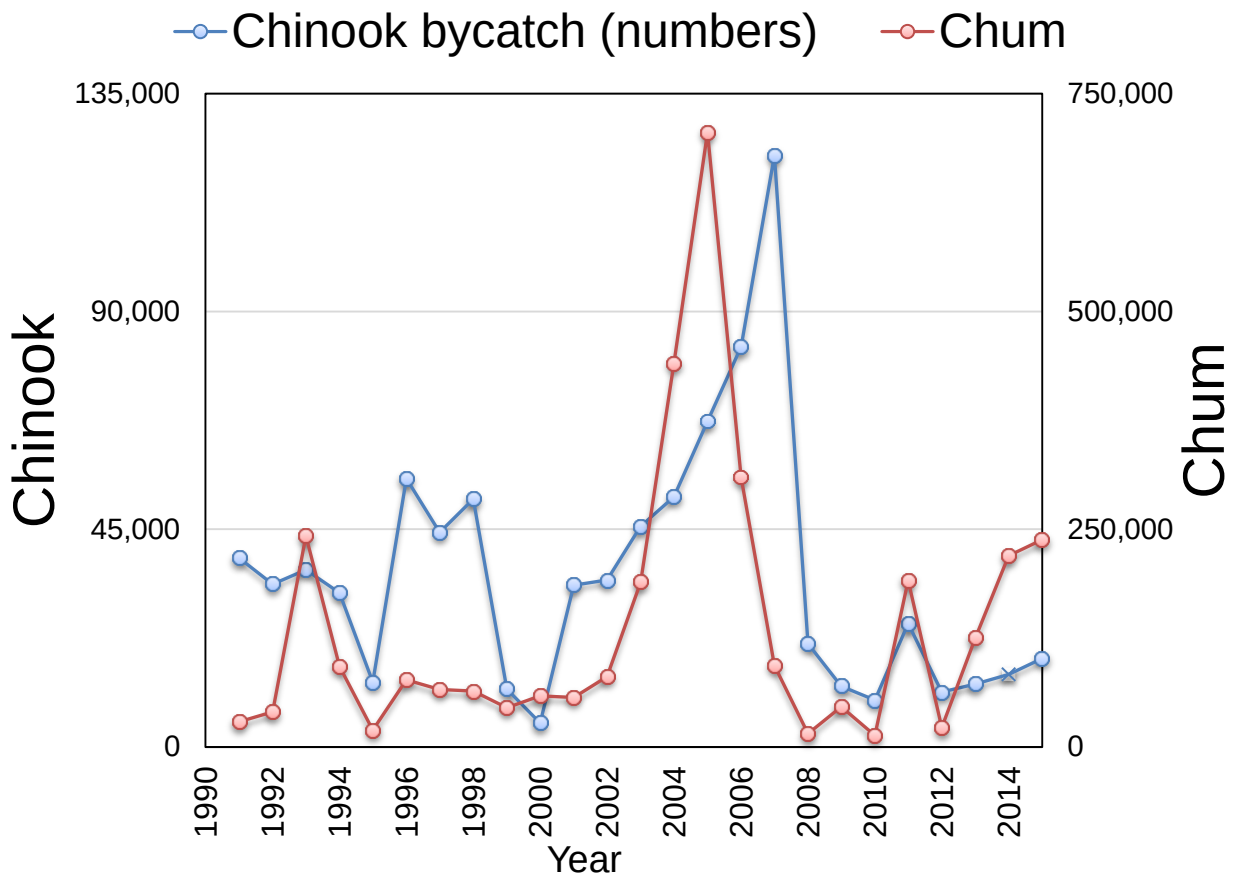

Figure 3-11 Chinook salmon PSC and Chum salmon PSC in the EBS pollock fishery 1991-2015.

BSAI Amendments 91 and 110 collectively restructure Chinook and Chum salmon bycatch management in the EBS pollock fishery (NPFMC/NMFS 2009; NPFMC 2015). In response to potentially constraining Chinook PSC limits combined with stringent vessel-level Incentive Plan Agreement requirements, the pollock industry has been extremely responsive to incidences of increased salmon bycatch. However, recent catches of squids have resulted in additional movement away from areas of high squid bycatch and have compromised the fleet's ability to avoid chum and Chinook salmon (Hafling and Gruver, 2015). Figure 3-12 shows the relative catches of squid and chum salmon by the pollock fleet and the increase in chum salmon bycatch just after the IC squid closure to the fleet. Chum salmon is often encountered in higher amounts beginning in August thus it is notknown to what extent the large observed increase in bycatch of chum is a direct result of movement away from the squid closure, however it did result in reduced flexibility by the fleet in fishing operations. This is further complicated by the overlaying closures to the fleet for chum, squid and efforts to likewise avoid herring (Figure 3-13). Amendment 110 was specifically designed to increase the flexibility of the fleet to avoid salmon bycatch at all levels of encounters. The current status quo under Alternative 1 for squid management has an adverse impact on salmon. Alternative 2, moving squid to EC, has the potential to reduce the adverse impact on chum and Chinook salmon as it would allow the pollock fleet additional flexibility in fishing in areas where fishing rates are good and salmon bycatch is low. There are no significant adverse impacts to BSAI Chinook and chum salmon PSC as a result of this action.

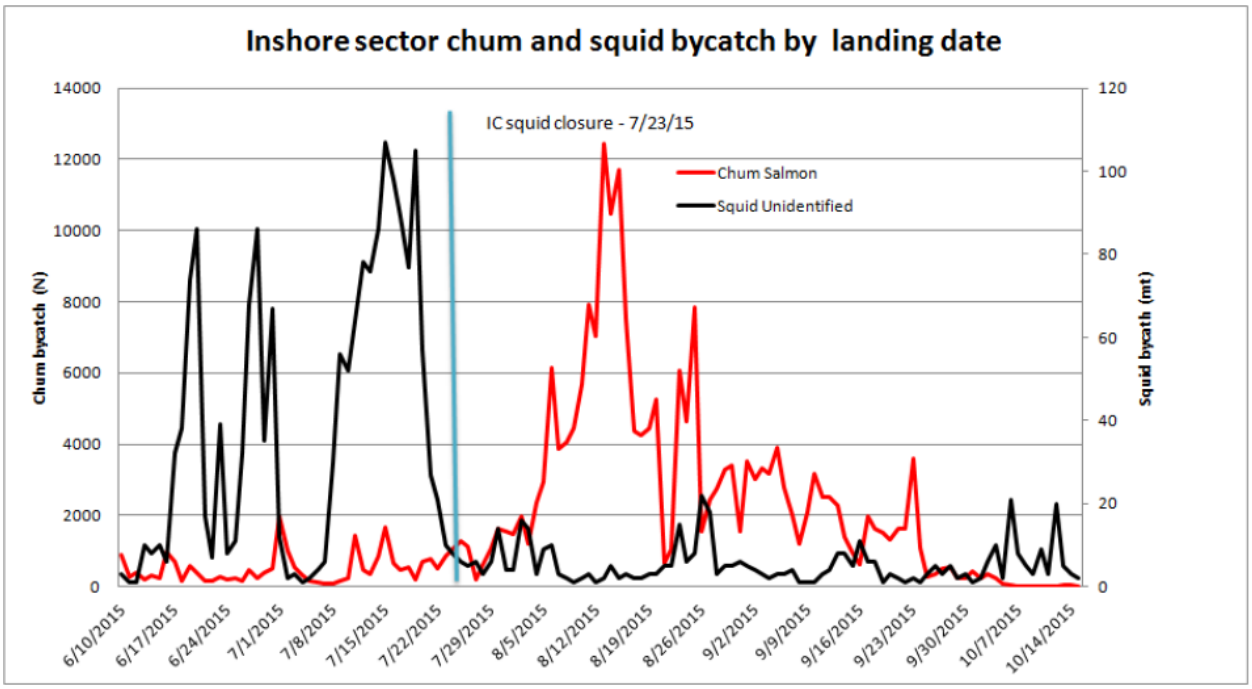

Figure 3-12 Inshore pollock sector chum salmon bycatch and squid incidental catch by week-ending date in the B-season, 2015 (from Haflinger and Gruver, 2015). The blue line notes the IC squid closure on 7/23/2015.

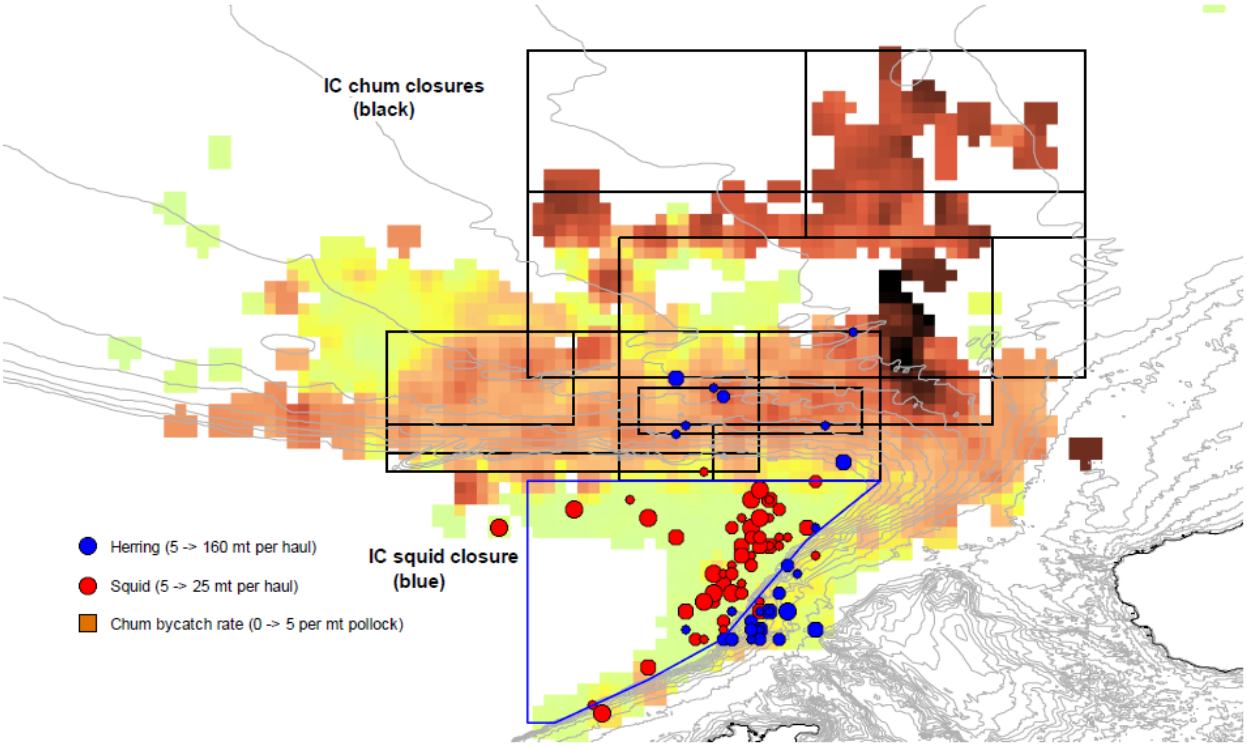

Figure 3-13 Inshore pollock sector chum salmon bycatch, squid incidental catch rates and herring PSC rates observed in the 2015 B-season in conjunctions with closures to the fleet for chum (black boxes) and squid (blue) (from Haflinger and Gruver, 2015).

In the GOA, squid catch has not been constraining thus while there are limits by area and season for Chinook PSC there has been no evidence that squid avoidance has impacted Chinook PSC rates. Thus the adverse impact to Chinook and chum salmon in the GOA is expected to be similar under both alternatives 1 and 2. There are no significant adverse impacts to GOA Chinook and chum salmon PSC as a result of this action.

Cumulative Effects on Prohibited Species

The following RFFAs are identified as likely to have an impact non-target species within the action area and timeframe. Amendment 110 to the BSAI groundfish FMP will be implemented in 2016. This amendment as discussed will directly modify the EBS pollock fishery bycatch of Chinook and chum salmon. Provisions of Amendment 110 include lower PSC caps in times of low western Alaska Chinook abundance, modified management of chum PSC within the IPAs, mandatory use of salmon excluders within the IPAs, more stringent measures in September and October to reduce times of high salmon encouters and the flexibility to catch 5% more of the quota in the A-season to allow for more fishing at times when Chinook salmon encounters are low and less fishing pressure late in the B-season. These measures are all anticipated to improve flexibility to avoid Chinook and chum salmon PSC and reduce the adverse impact of the fishery on salmon. Measures to address GOA trawl bycatch in the GOA will also address Chinook salmon caps in the future and may also reduce the adverse impact of those fisheries on salmon species.

Considering the direct and indirect impacts of the proposed action when added to the impacts of past and present actions previously analyzed in other documents that are incorporated by reference and the impacts of the reasonably foreseeable future actions listed above, the cumulative impacts of the proposed action are determined to be not significant.

4 Regulatory Impact Review

This Regulatory Impact Review (RIR) examines the benefits and costs of a proposed alternatives pertaining to an action that could move several species of squid in 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) from being 'in the fishery' to the ecosystem component in the BSAI and GOA

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

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

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

4.1 Statutory Authority

Under the Magnuson-Stevens Fishery and Conservation Act (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 the exclusive economic zone (EEZ). 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 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 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.

The squids fishery in the EEZ off Alaska is managed under the FMP for Groundfish of the GOA and BSAI. The proposed action under consideration would amend this FMP and Federal regulations at 50 CFR 679. Actions taken to amend FMPs or implement other regulations governing these fisheries must meet the requirements of Federal law and regulations.

4.2 Purpose and Need for Action

The Council adopted the following problem statement to originate this action in October 2015:

Establishing appropriate catch specifications for squid species in the BSAI and GOA has been problematic. The abundance of squid in the BSAI and GOA is uncertain and trawl survey biomass estimates, while available, likely greatly underestimate the true population level. Development of biological reference points is complicated by a lack of information. OFL and ABC specifications for squid have been based on average catch calculations which poorly estimate the OFL and potentially constrain fisheries. Squid are short-lived, highly productive, and an important prey species. There are no directed fisheries for squid in either the BSAI or GOA, there is limited retention, and there are no conservation concerns for squid populations in either region. According to the National Standard 1 guidelines, in order to be designated as an "ecosystem component" (EC), the species or species group should be a non-targeted species or species group; not subject to overfishing, overfished, or approaching an overfished condition; not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and not generally retained (a small amount could be retained) for sale or personal use. As such, moving squid to the Ecosystem Component seems to meet the intent of this category in the FMPs, and will continue to promote conservation and management measures for squid while alleviating unnecessary constraints on other groundfish fisheries.

4.3 Alternatives

Alternative 1, No Action

Under Alternative 1, squids would continue to be managed 'in the fishery' in both the BSAI and GOA groundfish FMPs. OFL, ABC, and TAC will continue to be set for squids in both areas. Stock assessments for squids would continue to be done annually. Directed fishing for squids is allowed however given the low TAC established annually for both the BSAI and GOA groundfish specifications, NMFS has determined that existing TAC levels are not sufficient to support a directed fishery in either region and thus continues to place squids in both areas on bycatch-only status. Therefore squids are taken only as incidental catch in groundfish fisheries (primarily pollock fisheries) in both regions.

Under Alternative 1, Table 10, GOA Retainable Percentages, and Table 11, BSAI Retainable Percentages, to 50 CFR 679 MRAs for squids as an incidental catch species are established at 20%. This allows vessels fishing for groundfish to retain a quantity of squids equal to, but no more than, 20% percent of the round weight or round weight equivalent of groundfish species open to directed fishing that are retained on board the vessel at any time during a fishing trip.

Alternative 2, Move squids to the Ecosystem Component category in both FMPs.

This alternative would include squids in the ecosystem component category in both the BSAI and GOA groundfish FMPs. Catch specifications (OFL, ABC, TAC) would no longer be required. Directed fishing for squid species would be prohibited. Options are included under this alternative (section 2.2.1- 2.2.2) for a range of MRAs for squids in both areas between 2-20% of the basis groundfish species. Absent selection of an MRA under Alternative 2, Option 2, all squids could theoretically be retained. However, absent an MRA the Council would need to provide direction as to what percentage amount of retention would constitute directed fishing.

4.4 Methodology for 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 decisionmakers "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 the No Action Alternative 1 with the action alternatives. The analyst then provides a qualitative assessment of the net benefit to the Nation of each alternative, compared to no action.

This analysis was prepared using data from the NMFS catch accounting system, which is the best available data to estimate total catch in the groundfish fisheries off Alaska. Total catch estimates are generated from information provided through a variety of required industry reports of harvest and at-sea discard, and data collected through an extensive fishery observer program. In 2003, NMFS changed the methodologies used to determine catch estimates from the NMFS blend database (1995 through 2002) to the catch accounting system (2003 through present).

The catch accounting system was implemented to better meet the increasing information needs of fisheries scientists and managers. Currently, the catch accounting system relies on data derived from a mixture of production and observer reports as the basis of the total catch estimates. The 2003 modifications in catch estimation included providing more frequent data summaries at finer spatial and fleet resolution, and the increased use of observer data. Redesigned observer program data collections were implemented in 2008, and include recording sample-specific information in lieu of pooled information, increased use of systematic sampling over simple random and opportunistic sampling, and decreased reliance on observer computations. As a result of these modifications, NMFS is unable to recreate blend database estimates for total catch and retained catch after 2002. Therefore, NMFS is not able to reliably compare historical data from the blend database to the current catch accounting system.

4.5 Description of Fisheries

4.5.1 Harvests

4.5.1.1 Catch in Target Fishery

Squids in the BSAI are currently managed as a single stock complex that includes all known squid species in the management area. Although no directed fishery exists for squids, they are caught and retained in sufficiently large numbers for them to be considered as "in the fishery".

In the BSAI, from 2000-2008 squid catches fluctuated around an average of approximately 1,000 mt, with anomalously high catches in some years (Table 4-1). From 2009 to 2013 catches were much smaller, ranging from 299 mt to 688 mt. In 2014, the catch was 1,678 mt, exceeding the TAC (prior to the increase from the non-specified reserves) which had been set at a low level based on the low catch levels of recent years. The 2015 catch was even higher (2,364 mt) and for the first time exceeded the ABC of 1,970 mt. Nearly all of the squids catch continues to be in the walleye pollock fishery (~90%, Table 3-3). In 2014 and 2015, the majority of the catches occurred in July near the start of the pollock B season. In both years catch rates declined dramatically after the pollock fleet adopted a voluntary special closure in the Bering Canyon area. Retention rates of squid by BSAI groundfish fisheries have ranged between 37% and 66% since 2008, with much of the retained squid being landed into whole fish.

In the GOA, nearly all squids (~90%) are caught incidentally in the pollock fishery and in the central GOA (Table 3-4). Since 2006 when an unusually high catch of squids occurred, squid catches have

ranged from 18 mt to 412 mt (Table 4-1). Most of this catch occurs in the pollock fishery, and because the pollock fishery is concentrated in Shelikof Strait this is also where most of the squid catch occurs.

Table 4-1 Catch and retention of squids by all groundfish fisheries by FMP area BSAI and GOA (2003-2015)

Year	BSAI			GOA		
	Catch (mt)	Retained	% Retained	Catch (mt)	Retained	% Retained
2003	1,282	912	71%	77	40	53%
2004	1,014	431	42%	157	108	69%
2005	1,186	843	71%	632	555	88%
2006	1,418	868	61%	1,516	1,280	84%
2007	1,188	689	58%	412	375	91%
2008	1,542	1,034	67%	84	75	90%
2009	360	181	50%	337	293	87%
2010	410	261	63%	131	118	90%
2011	336	144	43%	232	176	76%
2012	688	454	66%	18	2	13%
2013	299	111	37%	321	294	92%
2014	1,678	682	41%	94	55	59%
2015	2,364	1,302	55%	411	319	77%

Source: AKFIN, May 2016 Table originates from SQUID_CATCH_CONF(5-6)

4.5.2 Description of management

As mentioned above, there are no squid directed fisheries in the waters off Alaska at present. Under status quo, squid harvest is managed on bycatch status. Most of the squid bycatch in the BSAI and GOA is taken in the pollock fishery (e.g. 94% in the BSAI and 90% in the GOA in 2015, Ormseth 2015a, Ormseth 2015b). Squids are "in the fishery" under status quo and an annual OFL, ABC, and TAC for the squid complex is specified separately for the BSAI and GOA. If the total TAC of any squids is caught, retention of squids is prohibited for the remainder of the year. In the BSAI, a TAC reserve system plays an important role in managing the groundfish TACs. Annually, 15 percent of each TAC is put into a reserve.[7] The TAC remaining after deductions to the reserve is referred to as the ITAC. The reserve system provides a limited amount of flexibility to respond to yearly fluctuations in catch rates and maximize value to the industry. For species that contribute to the reserves, NMFS's Regional Administrator has the option of increasing an individual ITAC with TAC from the reserve, as long as the ABC and OY are not exceeded.

In 2014 and 2015, BSAI squid catch exceeded the ITAC. When the ITAC was exceeded in 2014 and 2015, NMFS increased the BSAI squid ITAC with TAC from the reserve to allow retention of squid bycatch in pollock and other directed fisheries. In 2015, the BSAI squid catch exceeded the total revised TAC set equal to the ABC, and retention of squid in the BSAI pollock fishery was prohibited from July 29, 2015 through the remainder of the year. The prohibition on squid retention was problematic for many BSAI pollock vessel operators in 2015, and NMFS OLE received numerous reported violations of the non-retention requirement for the remainder of the 2015 BSAI pollock B season.

Under status quo, the BSAI and GOA squid complexes are assessed as a Tier 6 species complex. The Tier 6 approach to prescribing the OFL is the least preferred method to specify an overfishing limit as it is

[7] Except for pollock, the portion of the sablefish TAC allocated to hook-and-line and pot gear, and Amendment 80 species.

based on the least amount of information and is not likely to accurately reflect a level of fishing that would jeopardize the capacity of a stock complex to produce MSY on a continuing basis. Tier 6 OFLs are based solely on fishery catch information rather than the biological reference points which form the basis for Tier 1 through 5 limits. Nonetheless, specification of OFL for Tier 6 species reflects the best estimate possible with the available data.

The Council increased the 2016 BSAI squid TAC to account for the higher incidental catch that occurred in 2014 and 2015. The 2016 ABC and TAC for BSAI squid are 5,184 mt and 1,500 mt, respectively. The BSAI squid ABC was 1,970 mt in 2014 and 2015; the TACs were set at 310 mt and 400 mt, respectively. The GOA squid ABC and TAC have been set at 1,148 mt since 2011 when the squid complex was first split out from the "other species" complex. From 2011 through 2015, squid catch in the GOA ranged from a low of 2% of the squid TAC in 2012 to 42% in 2015 (Ormseth 2015b).

At the start of the fishing year, directed fishing for squid is prohibited (also referred to as incidental catch or bycatch status) squids and may be retained up to an MRA of 20%. The MRA is the percentage of the retained catch of an incidental catch species to the retained catch of a species open for directed fishing (basis species). MRAs apply at any time for the duration of the fishing trip for each vessel. A vessel is not required to retain squids up to the MRA, however the difficulty of manually sorting squid from the pollock catch at-sea has likely contributed to higher retention of squid than may occur under different operational conditions. Historical squid retention amounts in the BSAI and GOA are presented in Table 3-10. Since 2003, the squid TAC has only been exceeded in the BSAI in 2015, 2006, and 2005. The squid TAC has not been reached in the GOA. As mentioned above, when the total TAC has been taken, squid may no longer be retained.

4.5.3 Harvesting Vessels

In the BSAI, both offshore sector and the CV sector catch squids (Table 4-2). During 2006 through 2015, total catch in the BSAI for the offshore sector ranged from a low of 157 mt in 2010 to a high of 762 mt in 2014, while total catch for the CV sector ranged from a low of 90 mt in 2013 to a high of 1,945 mt in 2015. Although both sectors retained BSAI squids, the CV sector retained a larger share of their total catch than the offshore sector. Retained catch of BSAI squids for the offshore sector ranged from a low of 19 mt in 2012 to high of 410 mt in 2007, while retained catch ranged from a low 89 mt in 2013 to high of 1,200 mt in 2015 for CV sector.

In the GOA, total catch of squids by the offshore sector ranged from a low of 4 mt in 2007 to a high of 42 mt in 2015, while total catch for the CV sector ranged from a low of 4 mt in 2012 to high of 1,508 mt in 2006. However, unlike in the BSAI, the offshore sector did not retain any squids in the GOA. Retained catch of GOA squids for the CV sector ranged from a low of 2 mt in 2012 to high of 1,279 mt in 2006.

Table 4-2 Total catch (mt) and retained catch (mt) of squids by sector and FMP area from 2006 through 2015

FMP area	Sector	Year	Total catch (mt)	Retained catch (mt)
BSAI	Offshore	2006	459	237
		2007	691	410
		2008	296	152
		2009	214	57
		2010	157	22
		2011	217	29
		2012	236	19
		2013	210	22
		2014	762	79
		2015	418	102
	CVs	2006	960	631
		2007	497	279
		2008	1,246	882
		2009	145	124
		2010	254	238
		2011	119	115
		2012	452	434
		2013	90	89
		2014	916	603
		2015	1,945	1,200
GOA	Offshore	2006	7	0
		2007	4	0
		2008	5	0
		2009	16	1
		2010	8	0
		2011	12	0
		2012	15	0
		2013	8	0
		2014	28	0
		2015	42	0
	CVs	2006	1,508	1,279
		2007	407	375
		2008	79	75
		2009	321	291
		2010	123	118
		2011	219	176
		2012	4	2
		2013	313	293
		2014	66	55
		2015	369	319

Source: AKFIN, May 2016
Table orginates from SQUID_CATCH_CONF(5-6)

Given that nearly all of the offshore squid that is retained is processed into bait and not a food product form, while a good share of the squid that retained by the CV sector is processed into food product form, the analysis will focus only on the CV sector's production of squid. To illustrate the CV sector's production of squid, the next series of tables (Table 4-3, Table 4-4, and Table 4-5) show the amount of CV sector squids processed into a product forms other than fish meal, squids that is processed into fish meal, and squids that is discarded at the shoreplant for CV sectors for BSAI and GOA from 2006 through 2015. As seen in all three tables, primary amongst the CVs in the BSAI was the AFA CVs, while in the GOA, both CV sectors were participants in the squids fishery.

Amongst the three tables, the most interesting is Table 4-3, which shows the amount of squids harvested by the CV sector that was produced into product forms other than fish meal. In the BSAI, the amount of squids processed into product forms other than fish meal ranged from a low of 87 mt in 2013 to a high of 493 mt in 2015. In GOA, production ranged from a low of 0 mt in 2014 and 2015 to a high of 505 mt in 2006.

Table 4-3 Total amount of squids processed into product forms other than fish meal by CV sector from 2006 through 2015 for the BSAI and GOA

FMP area	Year	Total CV processed squid (does not include squid processed into fish meal)					
		All CVs		AFA CVs		Non-AFA CVs	
		MT	Vessel count	MT	Vessel count	MT	Vessel count
BSAI	2006	265	45	237	26	29	19
	2007	234	32	234	32	0	0
	2008	440	31	440	31	0	0
	2009	123	25	123	24	0	1
	2010	216	28	216	28	0	0
	2011	107	30	107	30	0	0
	2012	251	55	251	55	0	0
	2013	87	25	87	25	0	0
	2014	437	51	437	51	0	0
	2015	493	64	483	60	10	4
GOA	2006	505	33	178	14	328	19
	2007	94	15	23	5	72	10
	2008	9	5	0	0	9	5
	2009	46	11	22	6	24	5
	2010	30	19	22	9	8	10
	2011	74	31	34	16	40	15
	2012	1	2	1	2	0	0
	2013	127	27	44	15	83	12
	2014	0	0	0	0	0	0
	2015	0	1	0	0	0	1

Source: AKFIN, May 2016

Table orginates from SQUID_EV_CONF(05-6) and SQUID_EV_CONF(05-10)

Table 4-4 Total amount of squids processed into fish meal by CV sector from 2006 through 2015 for the BSAI and GOA

FMP area	Year	Total amount of CV squid processed into fish meal					
		All CVs		AFA CVs		Non-AFA CVs	
		MT	Vessel count	MT	Vessel count	MT	Vessel count
BSAI	2006	353	50	346	30	7	20
	2007	46	32	45	31	1	1
	2008	442	28	442	28	0	0
	2009	2	29	2	28	1	1
	2010	22	29	22	29	0	0
	2011	8	40	8	40	0	0
	2012	186	50	184	49	2	1
	2013	2	42	2	42	0	0
	2014	166	48	166	48	0	0
	2015	734	48	734	48	0	0
GOA	2006	806	60	465	28	341	32
	2007	280	58	162	28	118	30
	2008	66	51	43	27	24	24
	2009	245	54	111	24	134	30
	2010	89	53	32	26	56	27
	2011	102	49	47	23	55	26
	2012	1	43	1	19	1	24
	2013	188	65	62	29	126	36
	2014	56	65	32	27	24	38
	2015	318	67	177	28	141	39

Source: AKFIN, May 2016

Table orginates from SQUID_EV_CONF(05-6) and SQUID_EV_CONF(05-10)

Table 4-5 Total amount of squids discarded at the shoreplant from 2006 through 2015 for the BSAI and GOA

FMP area	Year	Total amount of squid discarded at shoreplants					
		All CVs		AFA CVs		Non-AFA CVs	
		MT	Vessel count	MT	Vessel count	MT	Vessel count
BSAI	2006	309	83	286	61	23	22
	2007	214	40	214	39	0	1
	2008	330	26	330	24	0	2
	2009	15	19	15	19	0	0
	2010	10	17	10	17	0	0
	2011	4	24	4	24	0	0
	2012	17	36	17	34	0	2
	2013	1	26	1	26	0	0
	2014	311	52	311	52	0	0
	2015	650	68	649	66	0	2
GOA	2006	185	36	37	12	148	24
	2007	23	16	7	5	16	11
	2008	2	8	0	2	2	6
	2009	4	7	0	1	3	6
	2010	2	2	2	1	0	1
	2011	12	7	8	3	4	4
	2012	0	4	0	1	0	3
	2013	10	7	8	5	2	2
	2014	7	10	3	6	5	4
	2015	11	11	7	6	4	5

Source: AKFIN, May 2016

Table orginates from SQUID_EV_CONF(05-6) and SQUID_EV_CONF(05-10)

Table 4-6 provides ex vessel price of CV caught squids for all product forms combined (not including fish meal) and fish meal by CV sector for both the BSAI and GOA from 2006 through 2015. For product forms other than fish meal, the ex vessel price in the BSAI has ranged from a low of $0.03 per pound for 2006, 2007, and 2013, to a high of $0.18 per pound in 2014. In GOA, ex vessel price for product forms other than fish meal has ranged from a low of $0.05 per pound in 2008 and 2013, to a high of $0.10 per pound in 2015. Ex vessel price for fish meal has routinely been $0.02 per pound in the BSAI and GOA.

Table 4-6 Ex vessel price of CV caught squids for both all product forms combined (not including fish meal) and fish meal for both AFA and non-AFA sectors for BSAI and GOA from 2006 through 2015

Year	Ex vessel price of CV squid (not including fish meal) ($)				Ex vessel price of AFA CV squid that was processed into fish meal ($)			
	BSAI		GOA		BSAI		GOA	
	AFA	Non-AFA	AFA	Non-AFA	AFA	Non-AFA	AFA	Non-AFA
2006	0.03	0.00	0.07	0.07	0.02	0.00	0.02	0.02
2007	0.03	0.00	0.06	0.07	0.02	0.00	0.02	0.02
2008	0.06	0.00	0.00	0.05	0.02	0.00	0.02	0.02
2009	0.04	0.00	0.07	0.06	0.02	0.00	0.02	0.02
2010	0.07	0.00	0.07	0.07	0.02	0.00	0.02	0.02
2011	0.16	0.00	0.07	0.07	0.02	0.00	0.02	0.02
2012	0.11	0.00	0.07	0.00	0.02	0.00	0.02	0.02
2013	0.03	0.00	0.06	0.05	0.02	0.00	0.02	0.02
2014	0.18	0.00	0.00	0.00	0.02	0.00	0.00	0.00
2015	0.12	0.00	0.00	0.10	0.02	0.00	0.00	0.00

Source: AKFIN, May 2016
Table orginates from SQUID_EV_CONF(05-6) and SQUID_EV_CONF(05-10)

4.5.4 Production of Squids

This section provides a brief overview of squid production and the value of that production. Specifically, Table 4-7 and Table 4-8 provide total and annual production of squids, gross first wholesale value, and gross first wholesale price by product form from 2006 through 2015. As noted in the tables, the number of processors processing squids is limited, so some production data was confidential. Looking at total squid production from 2006 through 2015, whole fish/food fish had the highest production weight at 4.1 mt and the highest gross first wholesale value at $2 million. The next largest production weight was whole bait at 3.8 mt for a gross first wholesale value of $1.8 million. The product form with the highest gross first wholesale price was mantles at $0.60 per pound.

Table 4-7 Total production of all squid, gross first wholesale value, and gross first wholesale price by product form from 2006 through 2015

Product type	Production weight (mt)	Gross first wholesale value ($)	Gross first wholesale price ($)	Processor count
Fillets with skin & ribs	227,767	112,204	0.4926	4
Fish meal	193,892	54,760	0.2824	6
Gutted only	*	*	*	1
Octopus/Squid mantles	166,723	100,353	0.6019	4
Other-specify	*	*	*	2
Sections (shellfish only)	*	*	*	2
Stomachs (internal organs)	*	*	*	1
Whole bait	3,761,038	1,818,076	0.4834	50
Whole fish/food fish	4,175,480	2,033,610	0.4870	40

Source: AKFIN, May 2016
Table orginates from SQUID_PROD_CONF(5-6)
* denotes confidental data

Table 4-8 Annual Production of all squids, gross first wholesale value, and price by product type from 2006 through 2015

Year	Product type	Production weight (mt)	Gross first wholesale value ($)	Gross first wholesale price ($)	Processor count
2006	Fish meal	*	*	*	1
	Octopus/Squid mantles	*	*	*	1
	Sections (shellfish only)	*	*	*	1
	Whole bait	318	526,679	0.7517	5
	Whole fish/food fish	268	150,233	0.2541	6
	Total	754	**855,510**	**0.5144**	**14**
2007	Octopus/Squid mantles	*	*	*	1
	Other-specify	*	*	*	1
	Whole bait	112	77,058	0.3114	8
	Whole fish/food fish	188	179,746	0.4348	4
	Total	311	**268,457**	**0.3916**	**14**
2008	Fillets with skin & ribs	*	*	*	1
	Fish meal	*	*	*	1
	Whole bait	*	*	*	2
	Whole fish/food fish	346	250,225	0.3281	3
	Total	380	**278,803**	**0.3324**	**7**
2009	Fillets with skin & ribs	*	*	*	1
	Other-specify	*	*	*	1
	Whole bait	*	*	*	2
	Whole fish/food fish	142	165,762	0.5284	3
	Total	186	**222,351**	**0.5433**	**7**
2010	Whole bait	*	*	*	4
	Whole fish/food fish	*	*	*	2
	Total	186	**221,732**	**0.5420**	**6**
2011	Gutted only	*	*	*	1
	Whole bait	63	73,930	0.5325	4
	Whole fish/food fish	96	84,181	0.3977	3
	Total	168	**170,390**	**0.4593**	**8**
2012	Whole bait	136	154,723	0.5171	7
	Whole fish/food fish	1	1,374	0.5108	3
	Total	137	**156,097**	**0.5171**	**10**
2013	Fillets with skin & ribs	*	*	*	1
	Octopus/Squid mantles	*	*	*	1
	Stomachs (internal organs)	*	*	*	1
	Whole bait	51	43,545	0.3909	3
	Whole fish/food fish	86	108,834	0.5710	4
	Total	187	**227,731**	**0.5517**	**10**
2014	Whole bait	*	*	*	2
	Whole fish/food fish	*	*	*	2
	Total	411	**560,129**	**0.6185**	**4**
2015	Fillets with skin & ribs	*	*	*	1
	Fish meal	*	*	*	1
	Whole bait	*	*	*	1
	Whole fish/food fish	*	*	*	2
	Total	434	**705,878**	**0.7377**	**5**

Source: AKFIN, May 2016
Table orginates from SQUID_PROD_CONF(5-6)
* denotes confidental data

4.6 Analysis of Impacts

This section provides an analysis of two alternatives: (1) Status Quo/No Action, (2) include squids in the FMP as an Ecosystem Component species. Assessing the effects of the alternatives and options involves some degree of speculation. In general, the effects arise from the actions of invididual participants in the fisheries, under the incentivs created by different alternatives and options. Predicting these individual actions and their effects is constrained by incomplete information concerning the fisheries, including the absences of complete economic information and well-tested models that predict behavior under different institutional structures. In addition, exogenous factors, such as stock fluctuations, market dynamics, and macro conditions in the global economy, will influence the response of the participants udner each of the alternatives and options.

4.6.1 Alternative 1, No Action

Under this alternative, squids would continue to be included in the groundfish FMPs as "in the fishery," OFLs, ABCs, TACs, other management measures, and recordkeeping and reporting requirements would continue in both the BSAI and GOA. Alternative 1 would allow retention, subject to potential MRA restrictions, and marketing of incidentally caught squids.

Under Alternative 1, increased TAC in target fisheries where squids are caught incidentally, and the resulting increase in squid incidental catch, would be monitored via recordkeeping and reporting requirements. Thus Alternative 1 provides management structure necessary to monitor squid removals under changing conditions. Similary, Alternative 1 offers a management structure under which information can be collected to improve understanding of stock structure, thereby improving understanding of the potential effects of future climate change on stock structure.

At present, the OY cap established in the Groundfish FMP for the GOA is substantially greater than the total of all GOA TACs. Thus, continuing to place squid "in the fishery' in the GOA does not require "funding" of squid TAC via reductions in TACs of any other groundfish species. Further, since the present and past harvests of squid taken incidentally are well below the current ABCs calculated for squids, there would be no significant effects (either adverse or beneficial) on the stock biomass, fishing mortality, spatial or temporal distribution, or changes in prey availability for squids and groundfish target species in the GOA. There would be no significant (either beneficial or adverse) socioeconomic effects on those who harvest squid or other groundfish targets in the GOA.

In contrast to the potential effects of Alternative 1 in the GOA, continuing to place squids "in the fishery" in the BSAI FMP may have adverse effects on fishery total revenue. The BSAI Groundfish FMP specifies a total OY cap of 2 million mt. The total of all BSAI groundfish TACs may not exceed this 2 million mt cap. Thus, continuing to place BSAI squids "in the fishery" means that squid incidental catch would continue to be "funded" from reduced TAC of other, presently more valuable, BSAI groundfish species. In past years, the actual amount of reduction in TAC in other BSAI groundfish target fisheries with squid "in the fishery" in the BSAI has ranged from a low of 310 mt in 2014 to high of 1,970 mt for 2007-2010. However, it is also the case that TAC amounts for some groundfish species in the BSAI are not fully utilized under current conditions thereby reducing any impact of continuing to fund a squids TAC.

It is important to recognize that these impacts would continue to be spread across all Federal groundfish participants, including BSAI Community Development Quota (CDQ) entities, via the allocation made to sectors in the harvest specifications process. Thus, the impacts of continuing to fund a squids TAC would be borne by all harvesting platforms in an affected sector and gear type, further ameliorating potential impacts. The likely potential economic impacts of the continuation of squids be included "in the fishery" in the BSAI are not significant in comparision to the overall value of the BSAI groundfish fishery; however, the impacts may be significant to individual operators and/or target fishery sectors depending on how squids TAC continues to be funded.

Under status quo, pollock vessels are also likely to continue their effort to move from squid grounds to reduce squid bycatch in order to avoid having the pollock fishery closed. In recent years, squid bycatch has constrained pollock vessels, so pollock vessels instituted voluntary closures of regions with potentially high squids catch devised in concert with NMFS to prevent reaching the OFL on squids.

Finally, Alternative 1 will continue to impose recordkeeping and reporting requirements on the groundfish fishing industry, as well as fisheries management processes.

4.6.2 Alternative 2, Include squids in the FMP as an Ecosystem Component species

Under Alternative 2, which would include squids in the groundfish FMP as "ecosystem component" species, OFLs, ABCs, and TACs, would not need to be established. However, other management measures, and recordkeeping and reporting requirements could be established for squid. Since past harvests of squids taken incidentally are generally below the ABCs calculated for squids, there would be no significant effects on the stock biomass, fishing mortality, spatial or temporal distribution, or changes in prey availability for squids and groundfish target species in either the BSAI or GOA. There would be no significant socioeconomic effects on those who harvest squid or other groundfish targets in either the BSAI or GOA.

Alternative 2 prevents targeting of squids and prevents a "directed fishery" from being developed as well. This alternative allows for a continued small amount of squid to be retained and marketed; however, establishing a formal directed fishery would require further regulatory action. The action alternative would also prevent use of squid incidental catch as a basis species for retention of other groundfish.

One of the advantages of this alternative is pollock vessels would not have to relocate to other areas of the BSAI and GOA in order to avoid catching squid. The BSAI pollock fleet has a voluntary squids agreement to reduce squids catch in order to avoid closing the pollock fishery. This action would allow greater flexibility for the pollock fleet to seek areas of higher pollock CPUE and lower salmon bycatch without the limitations associated with catching squids incidentally.

4.6.2.1 Option 1: Continue to monitor and report catch of squid species

Under option 1 current catch accounting would continue to occur for squids species in both FMPs. A periodically updated stock assessment for squid species in both the GOA and BSAI would also be completed. Absent selection of an MRA under Alternative 2 Option 2, all squids could theoretically be retained. However, absent an MRA, the Council would need to provide direction as to what amount of retention would constitute directed fishing.

Since an ecosystem component species allows for a small amount of squids to be retained and marketed, and Option 1 continues monitoring and reporting thus the effects of this option are that the Council and NMFS would continue to get annual reports of squid catch and retention.

4.6.2.2 Option 2: Establish an MRA for squid species as incidental catch in the BSAI and GOA at 20%

Option 2 would establish an MRA for squid species as incidental catch in the BSAI and GOA using the MRAs (20%) in tables 10 and 11 of 50 CFR 678 when directed fishing for groundfish species at a level to discourage retention while allowing flexibility to prosecute groundfish fisheries.

Two suboptions of MRAs are also considered:

Suboption 1: establish MRA at 2% consistent with forage fish species
Suboption 2: establish MRA at 10%

In general, MRAs are the primary tool to regulate the catch of species closed to directed fishing. These rates do not necessarily reflect an "intrinsic" incidental catch rate, but reflect a balance between the recognized need to slow harvest rates, minimize the potential for discards, and, in some cases, provide an increased opportunity to harvest available TAC through limited topping off fishing behavior. The incentive for vessels to engage in topping off activity is directly related to the value of, and available market for, the incidental catch species relative to the associated operation costs of fishing for retaining

the target species. To reduce the incentive for vessels to top off on an incidental catch species due to conservation issues, low MRA rates are often utilized.

Since an ecosystem component species allows for a small amount of squids to be retained and marketed, and Option 2 would leave in place the existing MRA of 20 percent, it is likely that the retention of squids would continue at current levels or increase slightly given vessels would not be required to relocate from areas of high squid bycatch. As noted in Table 4-1, retained catch of squids in the BSAI and GOA has generally ranged between 100 mt to 1,000 mt from 2003 through 2015. Much of the retained catch of squids has been processed into whole fish/food fish, bait, and fish meal in the past, and that production type would likely continue under this option. Currently the MRA is 20% for the basis species and retention rates greater than 20% have been rare in the BSAI and GOA pollock fisheries, which have the highest squid catch. As noted in Table 3-10, from 2013-2015, there were 42,338 hauls in the BSAI and 1,940 hauls in GOA. Of those total hauls in the BSAI, 15 hauls would have exceeded a 20% MRA during the 2013-2015 period, while in the GOA, 2 hauls would have exceeded a 20% MRA.

Nearly all of the squids harvested and retained are caught incidental to the directed pollock fishery by CVs. Relative to the value of the pollock fishery, squids is significantly smaller in value. The ex vessel price of CV caught squids for all product forms combined (not including fish meal) in the BSAI has ranged from a low of $0.03 per pound for 2006, 2007, and 2013, to a high of $0.18 per pound in 2014 (Table 4-6). In GOA, ex vessel price for all product forms (not including fish meal) has ranged from a low of $0.05 per pound in 2008 and 2013, to a high of $0.10 per pound in 2015. Table 4-7 shows whole fish/food fish had the highest production weight at 4.1 mt and the highest gross first wholesale value at $2 million during the 2006 through 2015 period. The next largest production weight was whole bait at 3.8 mt for a gross first wholesale value of $1.8 million. Given the limited economic value of squids, maintaining an MRA of 20 percent under Option 2 would likely result in similar retention amounts of squids and likely not result in topping off behavior.

Option 2 includes two suboptions for consideration. Suboption 1 would establish a MRA at 2% consistent with forage fish species and Suboption 2 would establish a MRA at 10%. There appears to be no conservation issue that would necessitate reducing the MRA from the existing 20%. The amount of squids that are caught and retained currently is limited and the economic value of the retained squids is also limited. Lower MRA percentages would likely have some negative impacts on invidiual vessels due to the need to sort and discard squids at sea to stay below a 2% MRA or 10% MRA. As noted in Table 3-10, from 2013-2015, there were 42,338 hauls in the BSAI and 1,940 hauls in GOA. Of those total hauls in the BSAI, 411 hauls would have exceeded a 2% MRA and 53 hauls would have exceeded a 10% MRA during the 2013 through 2015 period. In the GOA, 45 hauls would have exceeded a 2% MRA and 6 hauls would have exceeded a 10%d MRA during the 2013 through 2015 period. Since there appears to be no conservation issue that necessitates reducing the squid MRA from its existing 20% in the BSAI and GOA, and the limited economic value of squids, reducing the MRA to 2% or 10% would increase operating costs for vessels while not providing any perceivable conservation benefit.

4.7 Management and Enforcement Considerations

4.7.1 Alternative 1, No Action

Currently, there are no squid directed fisheries in the waters off Alaska. Under status quo, squid harvest is managed on bycatch status. Most of the squid bycatch in the BSAI and GOA is taken in the pollock fishery (e.g. 94% in the BSAI and 90% in the GOA in 2015, Ormseth 2015a, Ormseth 2015b). Squids are "in the fishery" under status quo and an annual OFL, ABC, and TAC for the squid complex is specified separately for the BSAI and GOA. If the total TAC of any squids is caught, retention of squids is

prohibited for the remainder of the year. In the BSAI, a TAC reserve system plays an important role in managing the groundfish TACs. Annually, 15 percent of each TAC is put into a reserve.[8] The TAC remaining after deductions to the reserve is referred to as the ITAC. The reserve system provides a limited amount of flexibility to respond to yearly fluctuations in catch rates and maximize value to the industry. For species that contribute to the reserves, NMFS's Regional Administrator has the option of increasing an individual ITAC with TAC from the reserve, as long as the ABC and OY are not exceeded.

In 2014 and 2015, BSAI squid catch exceeded the ITAC. When the ITAC was exceeded in 2014 and 2015, NMFS increased the BSAI squid ITAC with TAC from the reserve to allow retention of squid bycatch in pollock and other directed fisheries. In 2015, the BSAI squid catch exceeded the total revised TAC set equal to the ABC, and retention of squid in the BSAI pollock fishery was prohibited from July 29, 2015 through the remainder of the year. The prohibition on squid retention was problematic for many BSAI pollock vessel operators in 2015, and NMFS OLE received numerous reported violations of the non-retention requirement for the remainder of the 2015 BSAI pollock B season.

Under status quo, the BSAI and GOA squid complexes are assessed as a Tier 6 species complex. The Tier 6 approach to prescribing the OFL is the least preferred method to specify an overfishing limit as it is based on the least amount of information and is not likely to accurately reflect a level of fishing that would jeopardize the capacity of a stock complex to produce MSY on a continuing basis. Tier 6 OFLs are based solely on fishery catch information rather than the biological reference points which form the basis for Tier 1 through 5 limits. Nonetheless, specification of OFL for Tier 6 species reflects the best estimate possible with the available data.

The Council increased the 2016 BSAI squid TAC to account for the higher incidental catch that occurred in 2014 and 2015. The 2016 ABC and TAC for BSAI squid are 5,184 mt and 1,500 mt, respectively. The BSAI squid ABC was 1,970 mt in 2014 and 2015; the TACs were set at 310 mt and 400 mt, respectively. The GOA squid ABC and TAC have been set at 1,148 mt since 2011 when the squid complex was first split out from the "other species" complex. From 2011 through 2015, squid catch in the GOA ranged from a low of 2% of the squid TAC in 2012 to 42% in 2015 (Ormseth 2015a).

At the start of the fishing year, directed fishing for squid is prohibited (also referred to as incidental catch or bycatch status) squids and may be retained up to an MRA of 20%. The MRA is the percentage of the retained catch of an incidental catch species to the retained catch of a species open for directed fishing (basis species). MRAs apply at any time for the duration of the fishing trip for each vessel. A vessel is not required to retain squids up to the MRA, however the difficulty of manually sorting squid from the pollock catch at-sea has likely contributed to higher retention of squid than may occur under different operational conditions. Historical squid retention amounts in the BSAI and GOA are presented in Table 3-10. Since 2003, the squid TAC has only been exceeded in the BSAI in 2015, 2006, and 2005. The squid TAC has not been reached in the GOA. As mentioned above, when the total TAC has been taken, squid may no longer be retained.

[8] Except for pollock, the portion of the sablefish TAC allocated to hook-and-line and pot gear, and Amendment 80 species.

Summary of Alternative 1 Management and Enforcement Considerations

Primary management considerations:

- Monitoring catch at the individual trip level to ensure that the squid MRA is not exceeded
- Monitoring cumulative catch to insure that catch is not approaching the ITAC
- Determining if additional TAC is available to be added to the ITAC
- Placing squid on prohibited species status when total TAC is exceeded or projected to be exceeded
- Considering further directed fishery closures when harvest approaches the OFL

Primary enforcement considerations:

- Challenge for enforcement to determine appropriate penalty for squid MRA overages due to low price of squid.
- Marked increase in enforcement actions when BSAI squid were place on prohibited species status in 2015.

4.7.2 Alternative 2, Move Squid in BSAI and GOA to EC

Under Alternative 2, squids would be added to the Ecosystem Component of the BSAI and GOA groundfish FMPs. Under this alternative, OFL, ABC, and TAC would not be specified and directed fishing for squids would be prohibited. Reporting of squid incidental catch would continue to be required for purposes of continued monitoring of the squid complex.

In addition to reducing constraints on directed fisheries that catch squid incidentally, Alternative 2 would reduce NMFS's inseason management burden. NMFS would not have to monitor total squid catch during the fishing year; there would be no need for inseason actions (e.g., placing squids on prohibited species status) to avoid exceeding a squid TAC or OFL. Because directed fishing on species in the Ecosystem Component is not allowed, NMFS would need a way to determine if directed fishing occurred. Traditionally, directed fishing is determined by the proportion of a species that is retained/landed relative to the other species retained/landed. To date, NMFS has not identified an alternative method for determining whether a vessel is directed fishing for squid without a metric akin to an MRA. **The Council could consider specifying a maximum tonnage of squid catch that would not constitute directed fishing as an alternative to an MRA. Under Alternative 2, the key element needed by NMFS, for management and enforcement, is a method to determine whether a vessel conducted directed fishing on squid.**

There are no management or enforcement issues to address with Option 1. Option 2 would establish an MRA for squid of 20% of the basis species. The MRA is 20% under status quo and retention rates greater than 20% have been rare in the BSAI and GOA pollock fisheries which have the highest squid catch (Table 3-10). An MRA of 20% (or greater) would reduce the burden for enforcement and industry by reducing the number of trips that are likely to exceed the MRA.

An MRA smaller than 20% (as contemplated by suboptions 1 and 2) would increase the burden on enforcement and industry and may create new problems in the execution of the directed fisheries that incidentally catch squid. If an MRA below 20% is established, vessel crew would have to sort and discard squid at sea. Discarded squid do not survive. Sorting catch to discard squid at sea would introduce opportunities for vessel crew to discard salmon before they are counted by an observer (BSAI) or delivered to a processor (GOA). NMFS OLE is concerned about increased opportunities for crew to discard salmon, the increased burden on industry to discard squid at sea, the probability that processors will not report overages of squid catch, and the potential for increased MRA violations under suboptions

1 and 2. In the absence of a conservation concern for squid, a low MRA is likely to create new problems and increase burden on industry and NMFS OLE.

Implications for State Fisheries

Adding squid to the Ecosystem Component of the BSAI and GOA FMPs would have no implications for State fishery management. The FMPs do not preclude development of directed fisheries in State waters. The State's current practice is to adopt the MRAs established for the federal fisheries in the State parallel fisheries and the State would likely adopt the Council's selected squid MRA as it has with the existing MRA.

A comparison of management considerations under Alternatives 1 and 2 is provided in Table 4-9. In sum, adding squid to the Ecosystem Component of the FMPs would reduce NMFS's management burden as NMFS would not have to monitor a squid TAC or OFL. The Council would need to specify some fishing threshold that constitutes directed fishing under Alternative 2. Adding squid to the Ecosystem Component would reduce NMFS's enforcement burden relative to 2015 when BSAI squid were placed on prohibited species status since the potential for that scenario would no longer exist. However, NMFS's enforcement burden is likely to increase should the Council select an MRA lower than the status quo.

Table 4-9. Comparison of squid stock complex management under Alternative 1 and 2

	"In the Fishery"	**Ecosystem Component**
Directed Fishery	No	No
MRA	Yes	Optional [a]
ABC/TAC/OFL	Yes	No
Frequently retained for use or sale	Yes	No
Total Catch Accounting	Yes	Yes [b]

[a] MRA or alternate "directed fishing" threshold needed
[b] Through existing observer program and catch accounting protocols

4.8 Net Benefit to the Nation

Alternative 1 would continue to defined squid as "in the fishery," with all of the associated management structure required under MSA. Squid would continue to be assessed under the calculation of OY, which is constrained at 2 million mt of TAC in the BSAI. The GOA OY cap far exceeds the sum of all GOA TACs and is nonbinding. Continuing to define squid as "in the fishery" means that squid incidental catch in the BSAI would be "funded" from reduced TAC of other more valuable BSAI groundfish species. Given that squid has limited economic value as a marketable catch relative to many of the BSAI groundfish specification species, continuing to define squid as "in the fishery" could decrease aggregate groundfish revenue.

Net benefits are not expected to decrease under Alternative 2. Alternative 2 would likely not affect current fishery revenue, as a small amount of squid is retained and marketed as food products, bait, and fish meal. In addition, pollock vessels operating in the BSAI would not have to relocate to other areas of the BSAI in order to avoid squid catch, which allows greater flexibility for the BSAI pollock fleet to seek areas of higher pollock CPUE and lower salmon bycatch thus potentially leading to higher gross revenues in the long term.

5 Initial Regulatory Flexibility Analysis

5.1 Introduction

This Initial Regulatory Flexibility Analysis (IRFA) addresses the statutory requirements of the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (5 U.S.C. 601-612). This IRFA evaluates the potential adverse economic impacts on small entities directly regulated by the proposed action.

The RFA, first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. Major goals of the RFA are 1) to increase agency awareness and understanding of the impact of their regulations on small business, 2) to require that agencies communicate and explain their findings to the public, and 3) to encourage agencies to use flexibility and to provide regulatory relief to small entities.

The RFA emphasizes predicting significant adverse economic impacts on small entities as a group distinct from other entities, and on the consideration of alternatives that may minimize adverse economic impacts, while still achieving the stated objective of the action. When an agency publishes a proposed rule, it must either 'certify' that the action will not have a significant adverse economic impact on a substantial number of small entities, and support that certification with the 'factual basis' upon which the decision is based; or it must prepare and make available for public review an IRFA. When an agency publishes a final rule, it must prepare a Final Regulatory Flexibility Analysis, unless, based on public comment, it chooses to certify the action.

In determining the scope, or 'universe', of the entities to be considered in an IRFA, NMFS generally includes only those entities that are directly regulated by the proposed action. If the effects of the rule fall primarily on a distinct segment, or portion thereof, of the industry (e.g., user group, gear type, geographic area), that segment would be considered the universe for the purpose of this analysis.

5.2 IRFA Requirements

Until the North Pacific Fishery Management Council (Council) makes a final decision on a preferred alternative, a definitive assessment of the proposed management alternatives cannot be conducted. In order to allow the agency to make a certification decision, or to satisfy the requirements of an IRFA of the preferred alternative, this section addresses the requirements for an IRFA. Under 5 U.S.C., section 603(b) of the RFA, each IRFA is required to contain:

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

- A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:
    1. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
    2. The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
    3. The use of performance rather than design standards;
    4. An exemption from coverage of the rule, or any part thereof, for such small entities.

In preparing an IRFA, an agency may provide either a quantifiable or numerical description of the effects of a proposed action (and alternatives to the proposed action), or more general descriptive statements, if quantification is not practicable or reliable.

5.3 Definition of a Small Entity

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

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

Section 601(3) of the RFA provides that an agency, after consultation with SBA's Office of Advocacy and after an opportunity for public comment, may establish one or more definitions of ''small business'' which are appropriate to the activities of the agency. In accordance with this provision, NMFS has established a small business size standard for all businesses in the commercial fishing industry, for the purpose of compliance with the Regulatory Flexibility Act only. A business is considered to be a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual gross receipts not in excess of $11.0 million for all its affiliated operations worldwide. The $11.0 million standard applies to all businesses classified under the North American Industry Classification System (NAICS) code 11411 for commercial fishing, including all businesses classified as commercial finfish fishing (NAICS 114111), commercial shellfish fishing (NAICS 114112), and other commercial marine fishing (NAICS 114119) businesses.

For fish processing businesses, the agency relies on the SBA size criteria. A seafood processor (NAICS 311710) is a small business if it is independently owned and operated, not dominant in its field of operation, and employs 750 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business that both harvests and processes fish (i.e., a catcher/processor) is a small business if it meets the criteria for the applicable fish harvesting operation (i.e., the $11.0 million standard described above). A wholesale business servicing the fishing industry is a

small business if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide.

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

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

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

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

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

5.4 Reason for Considering the Proposed Action

The Magnuson-Stevens Act requires that each regional fishery management council develop annual catch limits (ACLs) and accountability measures (AMs) for each of its managed fisheries designated as being in the fishery, such that each FMP under its jurisdiction has a mechanism for specifying ACLs at a level that overfishing does not occur in the fishery. The reauthorized MSA strengthened provisions to prevent and end overfishing and rebuild depleted fisheries. NMFS revised to National Standard 1 (NS1) guidelines at 50 CFR 600.310, to integrate these new requirements intended to reduce overfishing with existing

provisions related to overfishing, rebuilding overfished stocks, and achieving optimum yield. On January 16, 2009, NMFS issued final guidelines for NS1 (74 FR 3178).

In order to comply with the provisions of the MSA, NMFS issued a final rule to implement Amendments 95 and 96 to the BSAI FMP, and Amendment 87 to the GOA FMP (75 FR 38454, July 2, 2010, 75 FR 61639, October 6, 2010). Amendments 96/87 also amended the FMPs to organize the species in the FMP according to the National Standard 1 guidelines. In the National Standard 1 guidelines NMFS recommends two categories for species in an FMP; "in the fishery" and "ecosystem component." Amendments 96/87 established the EC category and designated prohibited species (defined in Table 2b to Part 679, and includes salmon, steelhead trout, crab, halibut, and herring) and forage fish (as defined in Table 2c to part 679 and § 679.20(i)) as EC species in both the BSAI and GOA FMPs. For EC species, NMFS retained the existing conservation regulations (such as no retention of prohibited species and the maximum retainable amount of 2 percent for forage fish).

These amendments also removed the "other species" and the "non-specified species" categories from the FMPs. The major taxonomic groups with similar life histories from the "other species" category (sharks, skates, octopus, and sculpins in the BSAI and sharks, squids, octopus, and sculpins in the GOA) were moved as species groups to the "in the fishery" category.

Since approximately 2010, the NPFMC non-target committee, the Plan Teams, and the SSC have at various times recommended that the NPFMC explore moving squids to the Ecosystem Component (EC) category. The rationale was always that as an extremely short-lived and highly productive group of species, it is very unlikely that squid could be overfished in the absence of a directed fishery. As a result squid bycatch (from a population perspective) is not a conservation concern.

In 2015, the groundfish plans teams for the BSAI and GOA recommended again that consideration be given to moving squid into the EC category. These recommendations were based upon the difficulty in establishing catch specifications for squid in both management regions as well as information regarding the impacts upon the BSAI pollock fishery in relative avoidance of Chinook and chum salmon species due to movement away from high areas of squid incidental catch. Squids are managed under Tier 6 because the groundfish bottom trawl surveys do not provide reliable biomass estimates thus specifications are recommended based upon different calculations based upon average catch. In some years this has led to actual catches which well exceed the TAC and sometimes the ABC particularly in the BSAI. While catches have not exceeded the OFL they have exceeded the ABC and approached the OFL in the BSAI prompting additional in-season management actions and industry-led voluntary area closures in the EBS pollock fishery in order to prevent catch exceeding the OFL and BSAI groundfish fishery-wide closures as a result. The assessment author, the Plan Teams, and the SSC are in agreement that it is highly unlikely that current catch levels or catches approaching the revised 2016-2017 harvest specifications would result in a conservation concern for BSAI or GOA squids. Therefore, the Council initiated an amendment to consider moving squids into the EC category in October 2015.

The Council adopted the following problem statement to originate this action in October 2015:

Establishing appropriate catch specifications for squid species in the BSAI and GOA has been problematic. The abundance of squid in the BSAI and GOA is uncertain and trawl survey biomass estimates, while available, likely greatly underestimate the true population level. Development of biological reference points is complicated by a lack of information. OFL and ABC specifications for squid have been based on average catch calculations which poorly estimate the OFL and potentially constrain fisheries. Squid are short-lived, highly productive, and an important prey species. There are no directed fisheries for squid in either the BSAI or GOA, there is limited retention, and there are no conservation concerns for squid populations in either region. According to the National Standard 1

guidelines, in order to be designated as an "ecosystem component" (EC), the species or species group should be a non-targeted species or species group; not subject to overfishing, overfished, or approaching an overfished condition; not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and not generally retained (a small amount could be retained) for sale or personal use. As such, moving squid to the Ecosystem Component seems to meet the intent of this category in the FMPs, and will continue to promote conservation and management measures for squid while alleviating unnecessary constraints on other groundfish fisheries.

5.5 Objectives of Proposed Action and its Legal Basis

Under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the Secretary of Commerce (NMFS Alaska Regional Office) and the North Pacific Fishery Management Council have the responsibility to prepare fishery management plans and associated regulations for the marine resources found to require conservation and management. NMFS is charged with carrying out the Federal mandates of the Department of Commerce with regard to marine fish, including the publication of Federal regulations. The Alaska Regional Office of NMFS, and Alaska Fisheries Science Center, research, draft, and support the management actions recommended by the Council. The GOA/BSAI groundfish fisheries are managed under the Fishery Management Plan for Groundfish of the GOA/BSAI Management Area. The proposed action represents an amendment, as required, to the fishery management plan, as well as amendments to associated Federal regulations.

The principal objective of the FMP amendment and proposed regultions is to move BSAI and GOA squids to Ecosystem Component.

5.6 Number and Description of Directly Regulated Small Entities

The IFRA estimates the number of directly regulated small entities based on size criteria established for industry sectors defined by the Small Business Administration (SBA). According to the SBA criteria, the groundfish fishery is defined as a finfish harvesting sector. An entity primarily involved in finfish harvesting is a small entity if it is independently owned and operated and not dominant in its field of operation (including its affiliates), and if it has combined annual gross receipts not in excess of $11.0 million for all its affiliated operations worldwide.

Based on the best available and most recent complete data for 2014, 158 vessels in the BSAI and GOA groundfish fisheries would be directly regulated by this action. Of those vessels directly regulated by this action, an estimated 40 vessels (trawl and non-trawl) are considered to be small entities. The IRFA assumes that each vessel is a unique entity; therefore the total number of directly regulated entities may be an overestimate because some vessels are likely affiliated through common ownership. These potential affiliations are not known with the best available data and cannot be predicted.

5.7 Recordkeeping, Reporting, and Other Compliance Requirements

Under the proposed action, squids would be added to the Ecosystem Component of the BSAI and GOA groundfish FMPs. Under this alternative, OFL, ABC, and TAC would not be specified and directed fishing for squids would be prohibited. Reporting of squid incidental catch would continue to be required for purposes of continued monitoring of the squid complex.

In addition to reducing constraints on directed fisheries that catch squid incidentally, the proposed action would reduce NMFS's inseason management burden. NMFS would not have to monitor total squid catch during the fishing year; there would be no need for inseason actions (e.g., placing squids on prohibited

species status) to avoid exceeding a squid TAC or OFL. Because directed fishing on species in the Ecosystem Component is not allowed, NMFS would need a way to determine if directed fishing occurred. Traditionally, directed fishing is determined by the proportion of a species that is retained/landed relative to the other species retained/landed. To date, NMFS has not identified an alternative method for determining whether a vessel is directed fishing for squid without a metric akin to an MRA. The Council could consider specifying a maximum tonnage of squid catch that would not constitute directed fishing as an alternative to an MRA. Under the proposed action, the key element needed by NMFS, for management and enforcement, is a method to determine whether a vessel conducted directed fishing on squid.

There are no management or enforcement issues to address with Option 1. Option 2 would establish an MRA for squid of 20% of the basis species. The MRA is 20% under status quo and retention rates greater than 20% have been rare in the BSAI and GOA pollock fisheries which have the highest squid catch. An MRA of 20% (or greater) would reduce the burden for enforcement and industry by reducing the number of trips that are likely to exceed the MRA.

An MRA smaller than 20% (as contemplated by suboptions 1 and 2) would increase the burden on enforcement and industry and may create new problems in the execution of the directed fisheries that incidentally catch squid. If an MRA below 20% is established, vessel crew would have to sort and discard squid at sea. Discarded squid do not survive. Sorting catch to discard squid at sea would introduce opportunities for vessel crew to discard salmon before they are counted by an observer (BSAI) or delivered to a processor (GOA). NMFS OLE is concerned about increased opportunities for crew to discard salmon, the increased burden on industry to discard squid at sea, the probability that processors will not report overages of squid catch, and the potential for increased MRA violations under suboptions 1 and 2. In the absence of a conservation concern for squid, a low MRA is likely to create new problems and increase burden on industry and NMFS OLE.

5.8 Federal Rules that may Duplicate, Overlap, or Conflict with Proposed Action

An IRFA is required to identify whether relevant Federal rules have been identified that would duplicate or overlap with the proposed action. This section will be completed once the Council has identified a preferred alternative.

5.9 Description of Significant Alternatives to the Proposed Action that Minimize Economic Impacts on Small Entities

An IRFA also requires a description of any significant alternatives to the proposed action(s) that accomplish the stated objectives, are consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities. This section will be completed once the Council has identified a preferred alternative.

6 Magnuson-Stevens Act and FMP Considerations

6.1 Magnuson-Stevens Act National Standards

Below are the 10 National Standards as contained in the Magnuson-Stevens Fishery and Conservation Act (Magnuson-Stevens Act). A brief discussion of how each alternative is consistent with the National Standards, will be provided in the Public Review draft of this analysis. In recommending a preferred alternative, the Council must consider how to balance the national standards.

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.

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

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

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.

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.

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

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

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.

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.

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

6.2 Section 303(a)(9) Fisheries Impact Statement

Section 303(a)(9) of the Magnuson-Stevens Act requires that a fishery impact statement be prepared for each FMP amendment. A fishery impact statement is required to assess, specify, and analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for (a) participants in the fisheries and fishing communities affected by the plan amendment; (b) participants in the fisheries conducted in adjacent areas under the authority of another Council; and (c) the safety of human life at sea, including whether and to what extent such measures may affect the safety of participants in the fishery.

The EA/RIR/IRFA prepared for this plan amendment constitutes the fishery impact statement. The likely effects of the proposed action are analyzed and described throughout the EA/RIR/IRFA. The effects on participants in the fisheries and fishing communities are analyzed in the RIR/IRFA chapters of the analysis (Chapters 4 and 5).. The effects of the proposed action on safety of human life at sea are evaluated in Section 4.6.2, and above under National Standard 10, in Section 6.1 Based on the information reported in this section, there is no need to update the Fishery Impact Statement included in the FMP.

The proposed action affects the groundfish fisheries in the EEZ off Alaska, which are under the jurisdiction of the North Pacific Fishery Management Council. Impacts on participants in fisheries conducted in adjacent areas under the jurisdiction of other Councils are not anticipated as a result of this action.

6.3 Council's Ecosystem Vision Statement

In February 2014, the Council adopted, as Council policy, the following:

Ecosystem Approach for the North Pacific Fishery Management Council

Value Statement

The Gulf of Alaska, Bering Sea, and Aleutian Islands are some of the most biologically productive and unique marine ecosystems in the world, supporting globally significant populations of marine mammals, seabirds, fish, and shellfish. This region produces over half the nation's seafood and supports robust fishing communities, recreational fisheries, and a subsistence way of life. The Arctic ecosystem is a dynamic environment that is experiencing an unprecedented rate of loss of sea ice and other effects of climate change, resulting in elevated levels of risk and uncertainty. The North Pacific Fishery Management Council has an important stewardship responsibility for these resources, their productivity, and their sustainability for future generations.

Vision Statement

The Council envisions sustainable fisheries that provide benefits for harvesters, processors, recreational and subsistence users, and fishing communities, which (1) are maintained by healthy, productive, biodiverse, resilient marine ecosystems that support a range of services; (2) support robust populations of marine species at all trophic levels, including marine mammals and seabirds; and (3) are managed using a precautionary, transparent, and inclusive process that allows for analyses of tradeoffs, accounts for changing conditions, and mitigates threats.

Implementation Strategy

The Council intends that fishery management explicitly take into account environmental variability and uncertainty, changes and trends in climate and oceanographic conditions, fluctuations in productivity for managed species and associated ecosystem components, such as habitats and non-managed species, and relationships between marine species. Implementation will be responsive to changes in the ecosystem and our understanding of those dynamics, incorporate the best available science (including local and traditional knowledge), and engage scientists, managers, and the public.

The vision statement shall be given effect through all of the Council's work, including long-term planning initiatives, fishery management actions, and science planning to support ecosystem-based fishery management.

In considering this action, the Council is being consistent with its ecosystem approach policy. This action considers appropriate and conservative management of an important prey species in the BSAI and GOA and the interactions with target stocks, especially pollock stocks in light of squid management. This is directly related to the Council's intention to accunt for environmental variability, fluctuations in productivity and interactions between managed species.

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