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## Public Comment Draft Report

### **Bering Sea and Aleutian Islands Atka Mackerel, Pacific Ocean Perch, and Northern Rockfish and Gulf of Alaska Pacific Ocean Perch, Northern Rockfish, and Dusky Rockfish**

November 5<sup>th</sup>, 2019

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Fishery client	Alaska Seafood Cooperative
Assessment Type	Initial Assessment

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## Glossary of Abbreviations

ABC	Acceptable Biological Catch
ACAP	Agreement on the Conservation of Albatrosses and Petrels
ADFG	Alaska Department of Fish and Game
ADP	Annual Deployment Plan
ADR	Alternative Dispute Resolution
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
AI	Aleutian Islands
AP	Advisory Panel
B	Biomass
BOF	Board of Fisheries
BS	Bering Sea
BSAI	Bering Sea and Aleutian Islands
CDQ	Community Development Quota
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COBLZ	<i>Chionoecetes opilio</i> Bycatch Limitation Zone
CoC	Chain of Custody
CP	Catcher-Processor
EBFM	Ecosystem-Based Fisheries Management
EBS	Eastern Bering Sea
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFP	Exempted Fishing Permit
EIS	Environmental Impact Statement
EM	Electronic Monitoring
EO	Executive Order
ESA	Endangered Species Act
ETP	Endangered, Threatened, and Protected
F	Fishing Mortality
FCR	Fisheries Certification Requirements
FE	Fishing Effects
FEP	Fishery Ecosystem Plan
FFP	Federal Fisheries Permit
FMP	Fishery Management Plan
GHL	Guideline Harvest Level
GOA	Gulf of Alaska
HAPC	Habitat Area of Particular Concern
HCR	Harvest Control Rule
IUCN	International Union for Conservation of Nature
LLP	License Limitation Program
LOA	Length Overall
LOF	List of Fisheries
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSRA	Magnuson-Stevens Fishery Conservation and Management Reauthorization Act
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fisheries Management Council (or the Council)
OFL	Overfishing Limit
OLE	Office of Law Enforcement
OY	Optimum Yield
PBR	Potential Biological Removal
PI	Performance Indicator
PRI	Point of Recruitment Impairment
PSC	Prohibited Species Catch
RPP	Rockfish Pilot Program

SAFE	Stock Assessment and Fishery Evaluation
SI	Scoring Issue
SSC	Scientific and Statistical Committee
TAC	Total Allowable Catch
UoA	Unit of Assessment
UoC	Unit of Certification
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
VME	Vulnerable Marine Ecosystem
VMS	Vessel Monitoring System

# 1 Executive Summary

To be drafted at Announcement Comment Draft Report stage

To be completed at Public Certification Report stage

This Public Comment Draft Report sets out the results of the Marine Stewardship Council (MSC) assessment of the Bering Sea and Aleutian Islands (BSAI) Atka Mackerel, Pacific Ocean perch, and northern rockfish and Gulf of Alaska (GOA) Pacific Ocean perch, northern rockfish, and dusky rockfish trawl fisheries. against the MSC Fisheries Standard for sustainability.

MRAG Americas was contracted by the Alaska Seafood Cooperative to undertake a full assessment of the Bering Sea and Aleutian Islands (BSAI) Atka Mackerel, Pacific Ocean perch, and northern rockfish and Gulf of Alaska (GOA) Pacific Ocean perch, northern rockfish, and dusky rockfish trawl fisheries. There are 6 units of assessment (UoAs) identified for this assessment (detailed below in Section 5).

The assessment was undertaken in accordance with the MSC Fisheries Certification Process v2.1, MSC Fisheries Standard v2.0/2.1, and using the MSC Guidance to MSC Fisheries Certification Requirements v2.3 which sets out the assessment and certification process. The default assessment tree contained within FCP v2.1 and FCR v2.0/2.01 were used to evaluate the fishery. As a result, to date, the following steps have been undertaken:

- Announcement of the assessment
- Appointment of the assessment team
- Notification on the use of the assessment tree
- Notification and undertaking of the site visit
- Production of the client draft report that describes the background to the fishery, the fishery management operation and the evaluation procedure and results
- Production of the Peer Review Report
- Response to Peer Review comments, and report revisions where necessary
- Production of the Public Comment Draft Report
- ~~Response to stakeholder comments on the Public Comment Draft Report~~
- ~~Review by MRAG Americas' qualified nominated Reviewer and Decision Maker~~
- ~~Consultation on the Final Report and Determination~~
- ~~Production of the Public Certification Report~~

The assessment team for this assessment comprises Erin Wilson, team leader and Principle 3, Jodi Bostrom covering Principle 2, and Giuseppe Scarcella, covering Principle 1 components of the Marine Stewardship Council (MSC) Fishery Standard, respectively.

A site visit was held in Seattle, Washington the week of June 19<sup>th</sup>, 2019, in conjunction with the reassessment of the certified Alaska BSAI and GOA flatfish, pollock and cod fisheries. During that time the assessment team met with scientists, fishery managers and stakeholders as well as client representatives. No written submissions were received ahead of the site visit by stakeholders.

The following strengths and weakness were identified with respect to each Principle:

## **Principle 1:**

Strengths: All stocks are above level consistent with maximum sustainable yield (MSY). Effective harvest strategies and harvest control rules (HCRs) are in place and effective.

Weaknesses: The use of a proxy for  $B_{MSY}$  and the uncertainties in stock structure.

## **Principle 2:**

Strengths: There is a high level of observer coverage and extensive catch data to show minimal impact on non-target species. Much is known about the habitats and ecosystem within which these UoAs operate.

Weaknesses: Some of the data are grouped for seabirds and dated for marine mammals so an up-to-date, clear picture of the impact on non-target species cannot always be obtained.



**Principle 3:**

**Strengths:** The federal groundfish fishery is a well-managed fishery. The Council operating procedures and management processes are thorough and supported by national law. The decision-making process and the overall roles and responsibilities are transparent, and both long-term and short-term objectives for management of this fishery are evident.

**Weakness:** The objectives at the state level are vague. Because this fishery is a 'parallel fishery', it is ultimately managed by the federal authorities and therefore follows the objectives laid out in the federal fishery management plans (FMPs). However, clearly stated objectives and a better explanation of how the state manages the parallel fishery component are needed.

Based on the information available to date, the BSAI Atka Mackerel, Pacific Ocean perch, and northern rockfish and GOA Pacific Ocean perch, northern rockfish, and dusky rockfish achieved overall scores are as follows:

**Table 1 Overall Scores**

Stock	Principle 1	Principle 2	Principle 3
BSAI	90.8	86.7	96.9
GOA	90.8	87.0	96.9

As such, the fishery is recommended for certification against the MSC Fishery Standard, as no indicator scored less than 60, and all average principle scores were above 80. All indicators scored greater than 80, thus there are also no conditions identified.

## 2 Report Details

### 2.1 Authorship and peer review details

To be drafted at Announcement Comment Draft Report stage

Peer reviewer information to be completed at Public Comment Draft Report stage

**Ms. Erin Wilson (Team Leader).** Erin Wilson joined MRAG Americas Inc. in 2015, where she currently works as a Senior Fisheries Consultant. She has served as a team member for several MSC assessments, including North and South Pacific albacore tuna, US West Coast Groundfish fishery, and US Atlantic Spiny dogfish and winter skate. She also conducts routine audits for the International Seafood Sustainability Foundation (ISSF), specifically for large-scale purse seine vessels catching tuna and the ISSF Participating Companies' annual audits. Prior to joining MRAG Americas, she spent 2 years working at the Oregon Department of Fish and Wildlife (ODFW) as a Natural Resource Specialist and Biological Technician for the Oregon Marine Reserves. She has collaborated on a multitude of projects that focus on marine science and conservation in both a biological and social science aspect. She received a M.Sc. in Marine Resource Management from Oregon State University and a B.S. in Zoology (with a marine emphasis) and a Spanish minor from Colorado State University.

**Dr. Giuseppe Scarcella.** Giuseppe Scarcella is an experienced fishery scientist and population analyst and modeller, with wide knowledge and experience in the assessment of demersal stocks. He holds a first degree in Marine Biology and Oceanography (110/110) from the Università Politecnica delle Marche, and a Ph.D. in marine Ecology and Biology from the same university, based on a thesis "Age and growth of two rockfish in the Adriatic Sea". After his degree he was offered a job as project scientist in several research programs about the structure and composition of fish assemblage in artificial reefs, off-shore platform and other artificial habitats in the Italian Research Council – Institute of Marine Science of Ancona (CNR-ISMAR, now CNR-IRBIM). During the years of employment at CNR-ISMAR he has gained experience in benthic ecology, statistical analyses of fish assemblage evolution in artificial habitats, fisheries ecology and impacts of fishing activities, stock assessment, otolith analysis, population dynamic and fisheries management. During the same years he attended courses of uni- multivariate statistics and stock assessment. He is also actively participating in the scientific advice process of FAO GFCM in the Mediterranean Sea. At the moment he is member of the Scientific, Technical and Economic Committee for Fisheries for the European Commission (STECF).

He is author and co-author of more than 50 scientific paper peer reviewed journals and more than 150 national and international technical reports, most of them focused on the evolution of fish assemblages in artificial habitats and stock assessment of demersal species. For some years now, Dr Scarcella has been working in fisheries certification applying the MSC standard for sustainable fisheries, currently concentrating on Principle 1 of the Standard.

Furthermore, Dr Scarcella holds the credential as Fishery team leader (MSC v2.0) and he completed the MSC procedure training 2.1. He also holds the credential as certifier of Responsible Fisheries Management (RFM).

**Ms. Jodi Bostrom.** Ms. Jodi Bostrom joined MRAG Americas as a Senior Fisheries Consultant and MSC Fisheries Program Manager in mid-2015. Prior to joining MRAG Americas, she spent five years working at the MSC in London as a Senior Fisheries Assessment Manager. Among many other things, she developed the MSC's benthic habitats policy and the Consequence Spatial Analysis (a risk-based framework for assessing habitat impacts in data-deficient situations) as part of the MSC Standard revision. Prior to the MSC, Jodi spent 11 years with the National Academy of Sciences' Ocean Studies Board in Washington, DC. She received an M.Sc. in Environmental Science at American University in 2006 and a B.Sc. in Zoology at the University of Wisconsin in 1999. Jodi's main areas of work at MRAG Americas are serving on MRAG Americas' MSC fisheries assessment teams and reviewing MSC assessment reports for technical quality and compliance. She has particular experience in the Principle 2 components of the MSC Standard.

## Peer Reviewers

The MSC's Peer Review College selected Al Cass and Matthew Cieri as the two peer reviewers for this assessment.

### Al Cass

Mr Al Cass has almost 50 years of experience in fisheries stock assessment in British Columbia, Canada. Key stocks include Pacific groundfish species, BC salmon and recently as a member of a Pacific herring technical working group to advise on technical issues related to a management strategy evaluation of BC herring fisheries. Nearly 35 years of experience was with Fisheries and Oceans Canada (DFO). In addition to extensive fisheries stock assessment experience, Mr Cass was head of the regional DFO peer-review science advisory process (2002-2009) in support of fisheries management in Canada (Canadian Science Advisory Secretariat (CSAS)). During 2009-2011 he also participated as the science lead and member of the DFO Pacific Cohen Commission of Inquiry into the decline of Fraser sockeye to: 1) coordinate Science sector staff contributions to the Inquiry; 2) participate in Team activities in an advisory capacity on Science and Department activities related to the Inquiry. Mr Cass retired from DFO in 2011 and has participated in fisheries science and management issues as a private fisheries consultant since then including as a team member of the MSC assessment of BC salmon fisheries (certified in 2016). He has also contracted with the Fisheries Sustainability Partnership Foundation (BC salmon) and Global Trust (Alaska salmon).

### Matthew Cieri

Dr Matthew Cieri is a graduate of the University of Maine where he received a PhD in Biological Oceanography studying the migrations of larval and juvenile American eel. After completing a post-doctoral fellowship at the Marine Biological Laboratory in Woods Hole Massachusetts USA, Dr Cieri started his fisheries career in 2001 working at the Maine Department of Marine Resources (MEDMR) where he is still employed full-time. His current focus is working on small pelagic fish stock assessment, trophic interactions, monitoring, and management analysis, though he has since branched out into Groundfish as well as other species. As a consultant since 2011, Dr Cieri has done work for a variety of clients including analyses for the Sustainable Fisheries Partnership, peer reviews of US stock assessments and methods for the Center for Independent Experts, reports for consumers for Seafood Watch, and Marine Stewardship Council work with ME Certification. Through his work at MEDMR and as a consultant, he continues to explore the interesting and connected fields of fishery stock assessment, trophic relations between small pelagic and groundfish stocks, and fisheries sustainability.

## 2.2 Version details

**Table 2. Fisheries program documents versions.**

Document	Version number
MSC Fisheries Certification Process	<b>Version 2.1</b>
MSC Fisheries Standard	<b>Version 2.0/2.01</b>
MSC General Certification Requirements	<b>Version 2.3</b>
MSC Reporting Template	<b>Version 1.1</b>

### 3 UoAs, Units of Certification (UoCs), and Results Overview

#### 3.1 UoAs and UoCs

##### 3.1.1 UoAs

MRAG Americas has confirmed that this fishery is within scope for MSC fisheries certification, meeting all scope criteria as laid out in Fisheries Certification Process (FCP) v2.1 section 7.5.

**Table 3. UoAs.**

UoA 1	Description
Species	Atka Mackerel ( <i>Pleurogrammus monopterygius</i> )
Stock	BSAI Atka Mackerel
Geographical area	Northeast Pacific, FAO 67 and FAO 61
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoA 2	Description
Species	Pacific Ocean Perch ( <i>Sebastes alutus</i> )
Stock	BSAI Pacific Ocean Perch
Geographical area	Northeast Pacific, FAO 67 and FAO 61
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoA 3	Description
Species	Northern Rockfish ( <i>Sebastes polyspinis</i> )
Stock	BSAI Northern Rockfish
Geographical area	Northeast Pacific, FAO 67 and FAO 61
Harvest method / gear	Bottom trawl

Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoA 4	Description
Species	Northern Rockfish ( <i>Sebastes polypsinis</i> )
Stock	GOA Northern Rockfish
Geographical area	Northeast Pacific, FAO 67
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoA 5	Description
Species	Pacific Ocean Perch ( <i>Sebastes alutus</i> )
Stock	GOA Pacific Ocean Perch
Geographical area	Northeast Pacific, FAO 67
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoA 6	Description
Species	Dusky Rockfish ( <i>Sebastes variabilis</i> )
Stock	GOA Dusky Rockfish
Geographical area	Northeast Pacific, FAO 67
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point

### 3.1.2 UoCs

To be drafted at Client and Peer Review Draft Report stage

To be completed at Public Certification Report stage

The report shall include a justification for any changes to the proposed Unit(s) of Certification (UoC).

Reference(s): FCP v2.1 Section 7.5

UoC 1	Description
Species	Atka Mackerel ( <i>Pleurogrammus monopterygius</i> )
Stock	BSAI Atka Mackerel
Geographical area	Northeast Pacific, FAO 67 and FAO 61
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoC 2	Description
Species	Pacific Ocean Perch ( <i>Sebastes alutus</i> )
Stock	BSAI Pacific Ocean Perch
Geographical area	Northeast Pacific, FAO 67 and FAO 61
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoC 3	Description
Species	Northern Rockfish ( <i>Sebastes polypsinis</i> )
Stock	BSAI Northern Rockfish
Geographical area	Northeast Pacific, FAO 67 and FAO 61
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoC 4	Description
Species	Northern Rockfish ( <i>Sebastes polypsinis</i> )

Stock	GOA Northern Rockfish
Geographical area	Northeast Pacific, FAO 67
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoC 5	Description
Species	Pacific Ocean Perch ( <i>Sebastes alutus</i> )
Stock	GOA Pacific Ocean Perch
Geographical area	Northeast Pacific, FAO 67
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point
UoC 6	Description
Species	Dusky Rockfish ( <i>Sebastes variabilis</i> )
Stock	GOA Dusky Rockfish
Geographical area	Northeast Pacific, FAO 67
Harvest method / gear	Bottom trawl
Client group	Alaska Seafood Cooperative
Other eligible fishers	None identified at this point

### 3.1.3 Scope of assessment in relation to enhanced or introduced fisheries

**To be drafted at Announcement Comment Draft Report stage**

**To be completed at Public Certification Report**

MRAG Americas, Inc. has determined that these fisheries are within scope of the MSC and do not include enhanced or introduced species, explosives or poison, unilateral exemptions, or successful prosecution for forced or child labour. The client group has submitted to the MSC the policies, practices and measures in place for these fisheries to ensure the absence of forced and child labour.

## 3.2 Assessment results overview

### 3.2.1 Determination, formal conclusion, and agreement

To be drafted at Final Draft Report

To be completed at Public Certification Report

The report shall include a formal statement as to the certification determination recommendation reached by the assessment team on whether the fishery should be certified.

The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

Reference(s): FCP v2.1 Section 7.21

### 3.2.2 Principle level scores

**Table 4. Principle level scores.**

Principle	UoA 1	UoA 2	UoA 3	UoA 4	UoA 5	UoA 6
Principle 1 – Target species	90.8	90.8	90.8	90.8	90.8	90.8
Principle 2 – Ecosystem impacts	86.7	86.7	86.7	87.0	87.0	87.0
Principle 3 – Management system	96.9	96.9	96.9	96.9	96.9	96.9

### 3.2.3 Summary of conditions

Not applicable. There are no conditions identified for this fishery.

### 3.2.4 Recommendations

**Table 5 Recommendations**

Recommendation number	PI	Recommendation
1	1.2.2	The uncertainty about the potential impact of foreign fisheries on target stocks and their connectivity with stocks outside US EEZ needs to be further investigated. Therefore, it is recommended to further support on-going research on stock structure, given the potential impacts can occur due to foreign catches on stock status.
2	3.2.1	The objectives at the state level are vague. Because this fishery is a 'parallel fishery', it is ultimately managed by the federal authorities and therefore follows the objectives laid out in the federal FMPs. However, clearly stated objectives and a better explanation of how the state manages the parallel fishery component are recommended.

## 4 Traceability and eligibility

### 4.1 Eligibility date

The eligibility date shall be the publication date of the Public Comment Draft Report, November 5<sup>th</sup>, 2019.).

### 4.2 Traceability within the fishery

To be completed at Public Certification Report stage

**Table 6. Traceability within the fishery.**

Factor	Description
<p>Will the fishery use gears that are not part of the (UoC)?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If this may occur on the same trip, on the same vessels, or during the same season;</li> <li>- How any risks are mitigated.</li> </ul>	No
<p>Will vessels in the UoC also fish outside the UoC geographic area?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If this may occur on the same trip;</li> <li>- How any risks are mitigated.</li> </ul>	<p><i>There is potential for trips to cover fishing in both the BSAI and GOA areas; there is a chance this could result in fishing for certified BSAI Atka mackerel and non-certified GOA Atka mackerel on the same trip. This could also be true for certified GOA dusky rockfish and non-certified BSAI dusky rockfish. Production from the fisheries is labelled with identifying information, which may include trip, date, and/or location of harvest, that would allow that catch to be traced inside or outside the UoC.</i></p>
<p>Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities.</p> <ul style="list-style-type: none"> <li>- Transport</li> <li>- Storage</li> <li>- Processing</li> <li>- Landing</li> <li>- Auction</li> </ul> <p>If Yes, please describe how any risks are mitigated.</p>	<p><i>This is a multi-species fishery with several certified and non-certified target species being handled at the same time.</i></p> <p><i>Management measures exist to mitigate any risk of mixing fish from different hauls. All hauls brought on board must be kept separate at all times during handling and processing. All product is packed on board with harvest location and other traceability information recorded and displayed on labelling. Vessels are subject to 100% observer coverage at all times.</i></p>
<p>Does transshipment occur within the fishery?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If transshipment takes place at-sea, in port, or both;</li> <li>- If the transshipment vessel may handle product from outside the UoC;</li> <li>- How any risks are mitigated.</li> </ul>	<p><i>Product is transferred to cargo vessels which transport it to secondary processing locations internationally. All product packaging has identifying labels prior to shipment. In addition, product is segregated either in a separate container or by netting.</i></p> <p><i>All of the mitigation measures described above apply.</i></p>
<p>Are there any other risks of mixing or substitution between certified and non-certified fish?</p> <p>If Yes, please describe how any risks are mitigated.</p>	No

### 4.3 Eligibility to enter further chains of custody

To be completed at Public Certification Report stage

Product is either processed at sea and transferred to cargo vessels in U.S. waters; or landed at onshore processing facilities. The activity of processing at sea would be included within the scope of the fishery certificate. The fishery certificate would end at offload from the fishing vessel to a cargo vessel, accompanied by a government required landing report (fish ticket, eLanding, or equivalent). Further processing would fall under the CoC of the receiving company. For the purposes of this assessment, all licensed groundfish fishing vessels in the BSAI and GOA may participate in the fishery.

A list of parties, or category of parties, eligible to use the fishery certificate, and sell product as MSC certified:

- Fishermen's Finest, Inc.



- North Star Fishing Co.
- Ocean Peace, Inc.
- O'Hara Corporation
- United States Seafoods, LLC

#### **4.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to enter further chains of custody**

To be completed at Public Certification Report stage

There are no IPI stocks in this fishery.

## **5 Scoring**

### **5.1 Summary of Performance Indicator level scores**

**Table 7. MSC fishery assessment scoring worksheet.**

BSAI Atka mackerel, POP, northern rockfish and GOA POP, northern rockfish and dusky rockfish FA

					BSAI AM	BSAI POP	BSAI NR	GOA POP	GOA DR	GOA NR
Principle	Component	Weight	Performance Indicator (PI)		Weight	Score				
<b>One</b>	Outcome	0.333	1.1.1	Stock status	1.000	100	100	100	100	100
	Management	0.667	1.2.1	Harvest strategy	0.250	85	85	85	85	85
			1.2.2	Harvest control rules & tools	0.250	85	85	85	85	85
			1.2.3	Information & monitoring	0.250	90	90	90	90	90
			1.2.4	Assessment of stock status	0.250	85	85	85	85	85
<b>Two</b>	Primary species	0.200	2.1.1	Outcome	0.333	90	90	90	90	90
			2.1.2	Management strategy	0.333	95	95	95	95	95
			2.1.3	Information/Monitoring	0.333	85	85	85	85	85
	Secondary species	0.200	2.2.1	Outcome	0.333	80	80	80	90	90
			2.2.2	Management strategy	0.333	80	80	80	80	80
			2.2.3	Information/Monitoring	0.333	85	85	85	85	85
	ETP species	0.200	2.3.1	Outcome	0.333	85	85	85	85	85
			2.3.2	Management strategy	0.333	85	85	85	90	90
			2.3.3	Information strategy	0.333	90	90	90	90	90
	Habitats	0.200	2.4.1	Outcome	0.333	95	95	95	95	95
			2.4.2	Management strategy	0.333	95	95	95	95	95
			2.4.3	Information	0.333	80	80	80	80	80

<b>Three</b>	Ecosystem	0.200	2.5.1	Outcome	0.333	80	80	80	80	80	80
			2.5.2	Management	0.333	90	90	90	90	90	90
			2.5.3	Information	0.333	85	85	85	85	85	85
	Governance and policy	0.500	3.1.1	Legal &/or customary framework	0.333	100	100	100	100	100	100
			3.1.2	Consultation, roles & responsibilities	0.333	100	100	100	100	100	100
			3.1.3	Long term objectives	0.333	100	100	100	100	100	100
	Fishery specific management system	0.500	3.2.1	Fishery specific objectives	0.250	80	80	80	80	80	80
			3.2.2	Decision making processes	0.250	95	95	95	95	95	95
			3.2.3	Compliance & enforcement	0.250	100	100	100	100	100	100
			3.2.4	Monitoring & management performance evaluation	0.250	100	100	100	100	100	100

Overall weighted Principle-level scores	BSAI AM	BSAI POP	BSAI NR	GOA POP	GOA DR	GOA NR
Principle 1 - Target species	90.8	90.8	90.8	90.8	90.8	90.8
Principle 2 - Ecosystem	86.7	86.7	86.7	87.7	87.7	87.7
Principle 3 - Management	96.9	96.9	96.9	96.9	96.9	96.9

## 5.2 Principle 1

### 5.2.1 Principle 1 background

#### Brief history of the fishery and its management

Alaskan groundfish fisheries operate within the BSAI and GOA. The BSAI is bordered by Alaska, the Bering Strait, and northeastern Siberia to the north and by the Alaska Peninsula, AI, and Commander Islands to the south. It covers over 2 million km<sup>2</sup> of the Pacific Ocean. The GOA is an inlet along the south coast of Alaska. It is bounded by the Alaska Peninsula and Kodiak Island and Cape Spencer. There are many fjords and inlets along the Alaska coast and large rivers like the Susitna and Copper Rivers that drain into the GOA.

The commercial groundfish fishery off of Alaska totalled approximately 2 million metric tons (t) in 2018 and represented about 85% of the total 2018 catch in Alaska (Fissel et al. 2018). Alaska's groundfish fishery is an important component of the total U.S. catches and accounted for 48% by weight of the total U.S. domestic landings (Fissel et al. 2018). There are two sectors in Alaska's FMP fisheries: (1) catcher vessels that deliver catch to processors on the coast and (2) at-sea processors that sell processed product directly to the first-wholesale market. In 2014, catcher vessels accounted for 49% of the ex-vessel value of the groundfish landings compared to 45% of the total catch because catcher vessels take larger percentages of higher-priced species such as sablefish. The groundfish fisheries target a diversity of species, such as pollock, Pacific cod, sablefish, and many flatfishes and rockfishes in addition to Atka mackerel, Pacific Ocean perch, and the other rockfish species evaluated here.

The BSAI and GOA groundfish fisheries are widely considered to be among the best-managed fisheries in the world and are managed by the National Marine Fisheries Service (NMFS) under federal FMPs adopted by the North Pacific Fisheries Management Council (NPFMC). NMFS is responsible for evaluating the status of the federally managed fisheries in the GOA and BSAI areas and provide annual stock assessment and fishery evaluation (SAFE) reports. Halibut is an exception to this structure and is managed by the International Pacific Halibut Commission. Within the BSAI and GOA areas, groundfish fisheries that are within the U.S. exclusive economic zone (EEZ) from 3 nm out to 200 nm from the coast are under federal authority, and near shore groundfish resources within state territorial waters (0-3 nm from shore) are managed by the State of Alaska. For most federal groundfish fisheries, the state regulations duplicate the federal regulations so that there is cohesive management in place.

#### **Range, habitat, and diet**

Atka mackerel is a semi-demersal, schooling species that is distributed from Japan and the east coast of the Kamchatka Peninsula, Russia, throughout the Komandorskiye and AI, north to the Pribilof Islands, and eastward through the GOA to Southeast Alaska. They are most abundant along the AI, particularly from Buldir Island to Seguam Pass. Nearer to Alaska, Atka mackerel schools are found along the outer continental shelf and upper slope region from 100-300m. They prefer rocky bottom habitats with a strong current. While adult Atka mackerel consume a variety of prey, the dominant items in their diets are zooplankton and small shrimp. In turn, Atka mackerel are very important as forage for other groundfish like Pacific cod (*Gadus macrocephalus*) and Arrowtooth flounder (*Atheresthes stomias*), seabirds, and marine mammals, including the endangered western stock of the Steller sea lion (*Eumetopias jubatus*).

Pacific Ocean perch were once distributed as far south as central Baja California, Mexico. Today they are distributed from northern California through the GOA to the BSAI area and west to Japan. Juvenile Pacific Ocean perch are found in shallower inshore waters at depths around 40m where they feed on copepods (Love et al. 2002). In these inshore areas, they are eaten by albacore tuna (*Thunnus alalunga*). Adult Pacific Ocean perch live in very deep waters (~100-800m) and feed mainly on krill, mysids, amphipods, and mesopelagic fishes. Northern fur seals are one of the main predators of Pacific Ocean perch (Love et al. 2002), but also sablefish, Pacific halibut, and sperm whales (Major & Shippen 1970). Seabirds, other rockfish, salmon, and lingcod are also predators on juvenile Pacific Ocean perch (Hulson et al. 2018). There are significant differences in seasonal depth distributions of Pacific Ocean perch (Love et al. 2002). In the summer, the adults are found in shallower depths (~150-300m), and in the fall, the fish are found further offshore in depths of ~300-400m. It is believed that these seasonal differences are related to feeding patterns in the summer and spawning in the winter.

Northern rockfish range from northernmost extent of British Columbia north throughout the BS and east to the Kamchatka Peninsula. This is one of the most northerly distributions of any of the more than 60 species of *Sebastes* in the North Pacific. Trawl surveys and commercial fishing data indicate that the preferred habitat of adult northern rockfish in the GOA is relatively shallow rises or banks on the outer continental shelf at depths of about 75-150m (Clausen & Heifetz 2002). The highest concentrations of northern rockfish from NMFS trawl survey catches appear to be associated with relatively rough (variously defined as hard, steep, rocky or uneven) bottom on these banks (Clausen & Heifetz 2002). Northern rockfish are mainly planktivorous, and their main prey are euphausiids and calanoid copepods. Larger fish like Pacific halibut eat them, but in general, data on predators of northern rockfish are

not well documented.

Dusky rockfish range from southern British Columbia north to the BS and west to Hokkaido, the northernmost island in Japan, but are only abundant in the GOA. Adult dusky rockfish are concentrated on offshore banks and near gullies on the outer continental shelf at depths of 100-200m. Like most Alaskan rockfish, dusky rockfish are long-lived and have been aged as old as 76 years.

## **Stock structure**

### *BSAI Atka mackerel*

There have been several studies on the stock structure of Atka mackerel, but these studies have provided conflicting information. Hence, it is still under debate whether the BSAI and GOA populations of Atka mackerel should be managed as a unit stock or separate populations due to the lack of consistent genetic stock structure over the species range. In particular, results from allozyme genetics studies comparing Atka mackerel samples from the western GOA with samples from the eastern, central, and western BSAI showed no evidence of discrete stocks (Lowe *et al.* 2018). A survey of genetic variation in Atka mackerel using microsatellite DNA markers provided little evidence of genetic structuring over the species range, although slight regional heterogeneity was evident in comparisons between some areas (Canino *et al.* 2010).

Despite the lack of variation found in the genetic studies, significant differences in population size, distribution, recruitment patterns, and resilience to fishing have been noted between the BSAI and GOA. This suggests that management for separate stocks may be appropriate. Data from bottom trawl surveys and the commercial fishery suggest that the Atka mackerel population in the GOA is smaller and more patchily distributed than that in the BSAI and composed almost entirely of fish >30 cm in length. There are also more areas of moderate Atka mackerel density in the BSAI than in the GOA. The lack of small fish in the GOA suggests that Atka mackerel recruit to that region differently than in the BSAI. Additionally, Atka mackerel steadily increase in size across their range, with individuals having smaller sizes at age in the western AI area and larger sizes at age in the eastern areas (McDermott 2010). These differences in population resilience, size, distribution, and recruitment support separate assessments and management of the GOA and BSAI stocks and a conservative approach to management of the GOA portion of the population.

### *BSAI and GOA Pacific Ocean perch*

Few studies have been conducted on the stock structure of Pacific Ocean perch. Based on allozyme variation, it was concluded that Pacific Ocean perch are genetically quite similar throughout their range, and genetic exchange may be the result of dispersion at early life stages. In contrast, preliminary analysis using mitochondrial DNA techniques suggests that genetically distinct populations of Pacific Ocean perch exist. Another study found distinct genetic populations on a relatively small scale in British Columbia. Currently, genetic studies are underway, which should clarify the genetic stock structure of Pacific Ocean perch. Despite the lack of genetic variation in Pacific Ocean perch, this species is assessed as separate stocks in the BSAI and GOA.

### *BSAI and GOA northern rockfish*

In the 2012 stock assessment for BSAI northern rockfish (Spencer & Ianelli 2018), a variety of data types was considered to evaluate stock structure. These included genetic data; barriers to the movement of the stock across the region; and spatial differences in growth, age, and size structure. Genetic evidence for stock structure was recently found in a study that examined northern rockfish from several locations in the BSAI during 2004 trawl surveys in the AI and Eastern Bering Sea (EBS) (Gharrett *et al.* 2012). In this study, three distinct groups were identified from the spatial analysis of molecular variance: 1) the EBS, 2) collections west of Amchitka Pass, and 3) collections between Amchitka Pass and Unimak Pass.

Trawl survey data from the AI were used to estimate von Bertalanffy growth curves and illustrated a differential (increasing) size at age from the western AI to the eastern AI. In general, northern rockfish in the western AI grew significantly slower than fish in the eastern AI or the southern BS. Ages as determined from the trawl surveys in 2002, 2004, and 2006 were significantly different between areas.

Physical barriers, while not typical in the marine environment, are a potential issue in the AI due to the occurrence of deep passes, typically exceeding 500m, which may limit the movement of marine biota. Spencer and Ianelli (2018) noted that on the north side of archipelago, the connection between the east and west AI is limited due to the break associated with Petrel Bank and Bowers Ridge, which results in water flowing away from the AI archipelago.

Because GOA northern rockfish grow much faster and larger than AI rockfish (Clausen & Heifetz 2002), they are considered to be different stocks. A study by Hanselman *et al.* (2007) showed evidence of relatively small-scale stock structure (120km) in GOA northern rockfish. The study determined that while there were few instances of localized depletion in this fishery, the current apportionment of acceptable biological catch (ABC) might not be sufficient to protect northern rockfish from this issue. Fine-scale stock structure would make the recovery of northern rockfish more difficult if localized depletion were ever an issue.

### *GOA dusky rockfish*

Currently dusky rockfish are managed as a single stock in the GOA. The available data suggest that there is a lack of significant stock structure; therefore, the 2015 stock assessment determined that the current resolution of spatial management is likely adequate and consistent with management goals (Lunsford *et al.* 2017).

## **Life history**

### *Atka mackerel*

Atka mackerel are obligate spawners on hard substrates. Females become reproductively mature at about 4 years old. They are polygamous, and the males provide the parental care by brooding single or multiple clumps of sticky yellow eggs in individual male territories within nesting colonies. The spawning phase begins in late July, peaks in early September, and ends in mid-October (Lauth *et al.* 2007a). Mature females spawn an average of 4.6 separate batches of eggs during the 12-week spawning period or about one egg batch every 2.5 weeks (McDermott *et al.* 2007). Males guard their territories until December when the eggs hatch. Atka mackerel colonies are widespread across the continental shelf of the BSAI and western GOA in areas with strong currents and at bottom depths of 144m (Lauth *et al.* 2007b). Analysis of ichthyoplankton tow data from the shelf-slope of Kodiak Island shows there may have been nesting colonies in the central GOA historically. Colonies may be limited on the lower end to the shelf-slope region due to the need for sufficient light and particular water temperatures and on the upper end due to the need to avoid wave surge and high densities of kelp and green sea urchins (Zolotov 1993, Lauth *et al.* 2007b). In the eastern and central BSAI, neustonic larvae about 10mm in length hatch from October to January with maximum hatching in late November (Kendall & Dunn 1985, Lauth *et al.* 2007a). Larvae and fry have been observed in coastal areas and also very far offshore in the BS and North Pacific Ocean (Materese *et al.* 2003, Mel'nikov & Efimkin 2003).

Natural mortality is a difficult parameter to estimate reliably. The 2018 assessment of BSAI Atka mackerel estimated a natural mortality value of 0.3 based on the regression model of Hoenig (1983), which relates total mortality as a function of maximum age. An analysis was undertaken to explore alternative methods to estimate natural mortality for Atka mackerel (Lowe *et al.* 2018), which found that the estimate of 0.3 was reasonable. Similarly, a natural mortality rate of 0.3 is assumed for GOA Atka mackerel based on analyses of natural mortality for BSAI Atka mackerel.

A qualitative look at the sparse GOA fishery age data shows recruitment patterns similar to the BSAI fishery. Therefore, the age of first recruitment for Atka mackerel appears to be 2-3 years and full recruitment at 4 years (Lowe *et al.* 2018). The maximum age seen in the GOA fishery is 13 years (1990 fishery). This compares with a maximum age of 15 years for the BSAI.

### *Pacific Ocean perch*

Pacific Ocean perch are viviparous with internal fertilization and the release of live young. Fertilization occurs in the fall, and the young are released in April and May. Larvae are thought to be pelagic and drift with the current, and oceanic conditions may sometimes cause advection to suboptimal areas (Ainley *et al.* 1993), resulting in high recruitment variability. However, larval studies of rockfish have been hindered by difficulties in species identification since many larval rockfish species share the same morphological characteristics (Kendall 2000). Juveniles are demersal and associated with rocky, high relief areas. The transition from pelagic to demersal may take place in the first year. Around age three, juveniles migrate to deeper waters on the continental shelf. Adults and juveniles are believed to remain spatially separated (Rooper *et al.* 2007).

According to Hulson *et al.* (2018), Pacific Ocean perch is a slow-growing species with a low rate of natural mortality (estimated at 0.06), a relatively old age at 50% maturity (8.4-10.5 years for females in the GOA), and a very old maximum age of 98 years in Alaska (84 years maximum age in the GOA). Age at 50% recruitment to the commercial fishery has been estimated to be 7-8 years in the GOA. Despite their viviparous nature, they are relatively fecund with the number of eggs per female in Alaska ranging from 10,000-300,000, depending upon the size of the fish (Leaman 1991). Rockfish in general were found to be about half as fecund as warm water snappers with similar body shapes (Haldorson & Love 1991).

### *Northern rockfish*

Like most other rockfish species, life history information is scarce—there have been no fecundity studies for northern rockfish. Some literature suggests that environmental factors may affect the condition of female rockfish that contribute to reproductive success (Hannah & Parker 2007, Rodgveller et al. 2012, Beyer et al. 2015). But, in general, relationships on fecundity and larval survival-at-age have not yet been evaluated for northern rockfish or other rockfish in Alaska. Stock assessments for Alaska groundfish have assumed that the reproductive success of mature fish is independent of age.

Northern rockfish are believed to be ovoviviparous with internal fertilization, and larval release occurs in the spring through the summer. It is not possible to identify larval northern rockfish to species at this point so information on larval spatial distribution and temporal duration has not been determined. Like the larvae, juveniles are pelagic, and at some point, transition to a demersal stage, but when this occurs is not known. They have fast growth rates, and GOA northern rockfish reach larger maximum lengths than BSAI northern rockfish.

### *Dusky rockfish*

Like other *Sebastes* species, dusky rockfish are ovoviviparous with internal fertilization, embryonic development, and larval hatching inside the mother. The release of pelagic larvae most likely occurs in the spring, but larval studies are hindered because they can only be positively identified by genetic analysis. The habitat of young juveniles is completely unknown. At some point they are assumed to migrate to the bottom and take up a demersal existence. Juveniles less than 25cm fork length are infrequently caught in bottom trawl surveys (Clausen & Heifetz 2002) or with other sampling gear.

## **Stock assessments**

Five of the seven standard scenarios are used in a Supplemental Environmental Impact Statement (EIS) prepared in conjunction with the final SAFE. These five scenarios, which are designed to provide a range of harvest alternatives that are likely to bracket the final total allowable catch (TAC) for the following year (i.e., in 2019 for a 2018 assessment) are as follows with years in reference to an assessment in 2018 (“max  $F_{ABC}$ ” refers to the maximum permissible value of  $F_{ABC}$  under Amendment 56):

*Scenario 1:* In all future years, fishing mortality ( $F$ ) is set equal to max  $F_{ABC}$ . (Rationale: Historically, TAC has been constrained by ABC, so this scenario provides a likely upper limit on future TACs.)

*Scenario 2:* In all future years,  $F$  is set equal to a constant fraction of max  $F_{ABC}$ , where this fraction is equal to the ratio of the  $F_{ABC}$  value for 2016 recommended in the assessment to the max  $F_{ABC}$  for 2016. (Rationale: When  $F_{ABC}$  is set at a value below max  $F_{ABC}$ , it is often set at the value recommended in the stock assessment.)

*Scenario 3:* In all future years,  $F$  is set equal to 50% of max  $F_{ABC}$ . (Rationale: This scenario provides a likely lower bound on  $F_{ABC}$  that still allows future harvest rates to be adjusted downward when stocks fall below reference levels.)

*Scenario 4:* In all future years,  $F$  is set equal to the 2010-2014 average  $F$ . (Rationale: For some stocks, TAC can be well below ABC, and recent average  $F$  may provide a better indicator of  $F_{TAC}$  than  $F_{ABC}$ .)

*Scenario 5:* In all future years,  $F$  is set equal to zero. (Rationale: In extreme cases, TAC may be set at a level close to zero.)

Two other scenarios are needed to satisfy the Magnuson-Stevens Fishery Conservation and Management Act’s (MSFCMA) requirement to determine whether a stock is currently in an overfished condition or is approaching an overfished condition. These two scenarios are as follows (for Tier 3 stocks, the MSY level is defined as B35%):

*Scenario 6:* In all future years,  $F$  is set equal to  $F_{OFL}$ . (Rationale: This scenario determines whether a stock is overfished. If the stock is expected to be above its MSY level in 2015 or above  $\frac{1}{2}$  of its MSY level in 2015 and above its MSY level in 2025 under this scenario, then the stock is not overfished.)

*Scenario 7:* In 2016 and 2017,  $F$  is set equal to max  $F_{ABC}$ , and in all subsequent years,  $F$  is set equal to  $F_{OFL}$ . (Rationale: This scenario determines whether a stock is approaching an overfished condition. If the stock is expected to be above its MSY level in 2027 under this scenario, then the stock is not approaching an overfished condition.)

BSAI Atka mackerel, BSAI Pacific Ocean perch, BSAI northern rockfish, GOA Pacific Ocean perch, GOA northern rockfish, and GOA dusky rockfish are all managed under Tier 3 of Amendment 56 to the FMP for the groundfish fishery of the BSAI and GOA. GOA Atka mackerel has been managed under Tier 6 specifications since 1996 due to the lack of reliable estimates of current biomass. Dusky rockfish in the BSAI is managed as part of a rockfish complex called “other rockfish” (as noted above). The “other rockfish” assessment is conducted with Tier 5 methods; in this methodology, an exploitation rate based on the natural mortality rate is applied to the estimated current biomass to obtain the ABC and overfishing limit (OFL). A standard set of projections is required for each stock managed under Tiers 1, 2, or 3. This set of projections encompasses seven harvest scenarios designed to satisfy the requirements of Amendment 56, the National Environmental Policy Act (NEPA), and the MSFCMA.

For each scenario, the projections begin with the vector of current year numbers at age as estimated in the assessment. This vector is then projected forward to the beginning of the following year using the schedules of natural mortality and selectivity described in the assessment and the best available estimate of total (year-end) catch for the current year. In each subsequent year, the F rate is prescribed on the basis of the spawning stock biomass (SSB) in that year and the respective harvest scenario. In each year, recruitment is drawn from an inverse Gaussian distribution whose parameters consist of maximum likelihood estimates determined from recruitments estimated in the assessment. SSB is computed in each year based on the time of peak spawning and the maturity and weight schedules described in the assessment. Total catch after the current year is assumed to equal the catch associated with the respective harvest scenario in all years. This projection scheme is run 1,000 times to obtain distributions of possible future stock sizes, F rates, and catches.

#### *BSAI Atka mackerel*<sup>1</sup>

Annual assessments are conducted for BSAI Atka mackerel using a statistical catch at age model (Lowe et al., 2018). The information used in the BSAI Atka mackerel stock assessment includes fishery catch, trawl survey biomass estimates, and age and length compositions of the fishery and survey catch. According to the most recent stock assessment in 2018, the population of BSAI Atka mackerel is not overfished and is not approaching an overfished condition (Table 6). The 2019 estimate of total biomass for BSAI Atka mackerel from the current assessment is approximately 498,300 t.

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<sup>1</sup> Information taken from the 2018 SAFE report for BSAI Atka mackerel: Lowe S, Ianelli JN, Palsson W (2018) Assessment of the Atka mackerel stock in the Bering Sea/Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE



**Table 8. Summary of BSAI Atka mackerel stock assessment outputs. Source: <https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIatka.pdf>**

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2018	2019	2019*	2020*
<i>M</i> (natural mortality rate)	0.30	0.30	0.30	0.30
Tier	3a	3a	3b	3b
Projected total (age 1+) biomass (t)	599,000	600,440	498,320	514,400
Projected Female spawning biomass	139,300	125,600	106,800	102,700
<i>B</i> <sub>100%</sub>	307,150	307,150	283,780	283,780
<i>B</i> <sub>40%</sub>	122,860	122,860	113,510	113,510
<i>B</i> <sub>35%</sub>	107,500	107,500	99,320	99,320
<i>F</i> <sub>OFL</sub>	0.46	0.46	0.53	0.53
<i>maxF</i> <sub>ABC</sub>	0.38	0.38	0.44	0.44
<i>F</i> <sub>ABC</sub>	0.38	0.38	0.44	0.44
OFL (t)	108,600	97,200	79,200	73,400
maxABC (t)	92,000	84,400	68,500	63,400
ABC (t)	92,000	84,400	68,500	63,400
Status	As determined this year for:		As determined this year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

\*Projections are based on estimated total catch of 58,900 t and 54,500 t in place of maximum permissible ABC for 2019 and 2020, respectively.

#### *BSAI Pacific Ocean perch*<sup>2</sup>

In 2005, BSAI rockfish were moved to a biennial assessment schedule to coincide with the frequency of trawl surveys in the AI and the EBS slope. These surveys occur in even years, and for these years, a full assessment of Pacific Ocean perch in the BSAI area is conducted. BSAI Pacific Ocean perch is managed as a Tier 3 species.

An age-structured population dynamics model, implemented in the software program AD Model Builder, was used to obtain estimates of recruitment, numbers at age, and catch at age (Spencer and Ianelli, 2018). A variety of data sources are available for assessing the current biomass and stock status of BSAI Pacific Ocean perch. These data sources include catch rates and age and length samples from the commercial fishery and trawl survey estimates of biomass. The 2019 estimate of total biomass for BSAI Pacific Ocean perch from the current assessment is approximately 934,000 t. According to the last SAFE report, the BSAI Pacific Ocean perch does not show overfishing and overfished status (Table 7).

<sup>2</sup> Information taken from the 2016 SAFE report for BSAI Pacific Ocean perch: Spencer PD, Ianelli JN (2016) Assessment of the Pacific Ocean perch stock in the Bering Sea/Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. Alaska Fisheries Science Center

**Table 9. Summary of BSAI Pacific Ocean perch stock assessment outputs. Source: <https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIPop.pdf>**

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2018	2019	2019	2020
<i>M</i> (natural mortality rate)	0.058	0.058	0.056	0.056
Tier	3a	3a	3a	3a
Projected total (age 3+) biomass	749,925	734,431	934,293	914,577
Female spawning biomass (t)				
Projected	305,804	295,593	399,024	386,835
<i>B</i> <sub>100%</sub>	536,713	536,713	645,738	645,738
<i>B</i> <sub>40%</sub>	214,685	214,685	258,295	258,295
<i>B</i> <sub>35%</sub>	187,849	187,849	226,008	226,008
<i>F</i> <sub>OFL</sub>	0.101	0.101	0.095	0.095
<i>maxF</i> <sub>ABC</sub>	0.082	0.082	0.079	0.079
<i>F</i> <sub>ABC</sub>	0.082	0.082	0.079	0.079
OFL (t)	51,675	50,098	61,067	59,396
maxABC (t)	42,509	41,212	50,594	49,211
ABC (t)	42,509	41,212	50,594	49,211
<b>Status</b>				
	As determined last year for:		As determined this year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

\*Projections are based on estimated catches of 34,699 t and 33,752 t used in place of maximum permissible ABC for 2019 and 2020.

### GOA Pacific Ocean perch<sup>3</sup>

Pacific Ocean perch is assessed on a biennial stock assessment scheduled in odd years to coincide with the availability of new catch survey data. 2017 was the last full assessment for GOA Pacific Ocean perch with an updated assessment and projection model results (Hulson et al. 2018). A statistical age-structured model is used for GOA Pacific Ocean perch, which qualifies as a Tier 3 stock. This assessment consists of a population model, which uses survey and fishery data to generate a historical time series of population estimates, and a projection model, which uses results from the population model to predict future population estimates and recommended harvest levels. According to the 2017 assessment, overfishing is not occurring, the stock is not overfished, and it is not approaching an overfished condition (Figure 8). The 2019 estimate of total biomass for GOA Pacific Ocean perch from the current assessment is approximately 497,000 t.

<sup>3</sup> Information taken from the 2017 SAFE report for GOA Pacific Ocean perch: Hulson P-JF, Hanselman DH, Lunsford CR, Fissel, B (2017) Assessment of the Pacific Ocean perch stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. Alaska Fisheries Science Center

**Table 10. Summary of GOA Pacific Ocean perch stock assessment outputs. Source: <https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOApop.pdf>**

Quantity	As estimated or specified <i>last</i> year for:		As estimated or recommended <i>this</i> year for:	
	2018	2019	2019	2020 <sup>1</sup>
<i>M</i> (natural mortality)	0.066	0.066	0.066	0.066
Tier	3a	3a	3a	3a
Projected total (age 2+ ) biomass (t)	511,934	497,600	496,922	481,608
Projected Female spawning biomass	180,150	177,539	176,934	172,345
<i>B</i> <sub>100%</sub>	293,621	293,621	293,621	293,621
<i>B</i> <sub>40%</sub>	117,448	117,448	117,448	117,448
<i>B</i> <sub>35%</sub>	102,767	102,767	102,767	102,767
<i>F</i> <sub>OFL</sub>	0.113	0.113	0.113	0.113
<i>maxF</i> <sub>ABC</sub>	0.094	0.094	0.094	0.094
<i>F</i> <sub>ABC</sub>	0.094	0.094	0.094	0.094
OFL (t)	34,762	34,010	<b>33,951</b>	32,876
maxABC (t)	29,236	28,605	<b>28,555</b>	27,652
ABC (t)	29,236	28,605	<b>28,555</b>	27,652
Status	As determined <i>last</i> year for:		As determined <i>this</i> year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

<sup>1</sup>Projected ABCs and OFLs for 2019 and 2020 are derived using estimated catch for 2018, and projected catches for 2019 and 2020 based on realized catches from 2015-2017. This calculation is in response to management requests to obtain more accurate projections.

#### BSAI northern rockfish<sup>4</sup>

In 2005, BSAI northern rockfish were moved to a biennial assessment schedule to coincide with the frequency of trawl surveys in the AI and the EBS slope. These surveys occur in even years, and for these years, a full assessment of northern rockfish in the BSAI area is conducted. Northern rockfish in the BSAI region were assessed under Tier 5 of Amendment 56 of the Council's BSAI Groundfish FMP until 2004. Otoliths from AI surveys allowed the development of an age-structured model for northern rockfish beginning in 2003. Since 2004, BSAI northern rockfish have been assessed as a Tier 3 species in the BSAI Groundfish FMP.

An age-structured population model, implemented in the software program AD Model Builder, was used to obtain estimates of recruitment, numbers at age, and catch at age (Spencer and Ianelli, 2018b). The assessment model for northern rockfish is very similar to that currently used for BSAI Pacific Ocean perch, which was used as a template for the current model northern rockfish. A variety of sources of data are available for assessing the current biomass and stock status of BSAI northern rockfish. These data sources include catch rates and age and length samples from the commercial fishery and trawl survey estimates of biomass. BSAI northern rockfish was not subjected to overfishing in 2017, the stock is not overfished, and it is not approaching an overfished condition (Figure 9). The 2019 estimate of total biomass for BSAI northern rockfish from the current assessment is approximately 244,000 t.

<sup>4</sup> Information taken from the 2014 SAFE report for BSAI northern rockfish: Spencer PD, Ianelli JN (2014a) Assessment of the Northern Rockfish stock in the Bering Sea/Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. Alaska Fisheries Science Center

**Table 11. Summary of BSAI northern rockfish stock assessment outputs. Source:**  
<https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAInork.pdf>

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2018	2019	2019*	2020*
<i>M</i> (natural mortality rate)	0.046	0.046	0.046	0.046
Tier	3a	3a	3a	3a
Projected total (age 3+) biomass (t)	246,160	244,963	244,196	242,426
Female spawning biomass (t)				
Projected	106,486	104,699	104,201	102,480
<i>B</i> <sub>100%</sub>	164,674	164,674	164,674	164,674
<i>B</i> <sub>40%</sub>	65,870	65,870	65,870	65,870
<i>B</i> <sub>35%</sub>	57,636	57,636	57,636	57,636
<i>F</i> <sub>OFL</sub>	0.080	0.080	0.080	0.080
<i>maxF</i> <sub>ABC</sub>	0.065	0.065	0.065	0.065
<i>F</i> <sub>ABC</sub>	0.065	0.065	0.065	0.065
OFL (t)	15,888	15,563	15,507	15,180
maxABC (t)	12,975	12,710	12,664	12,396
ABC (t)	12,975	12,710	12,664	12,396
<b>Status</b>	As determined last year for: for:		As determined this year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

\*Projections are based on estimated catches of 5,808 t and 5,684 t used in place of maximum permissible ABC for 2019 and 2020.

#### GOA northern rockfish<sup>5</sup>

Northern rockfish is assessed on a biennial stock assessment schedule in odd years to coincide with the availability of new survey data. 2015 was the last full assessment for GOA northern rockfish with an updated assessment and projection model results. A statistical age-structured model is used for GOA northern rockfish, which qualifies as a Tier 3 stock. This assessment consists of a population model, which uses survey and fishery data to generate a historical time series of population estimates, and a projection model, which uses results from the population model to predict future population estimates and recommended harvest levels (Cunningham et al., 2018). According to the 2018 assessment, overfishing is not occurring, the stock is not overfished, and it is not approaching an overfished condition (Figure 10). The 2019 estimate of total biomass for GOA northern rockfish from the current assessment is approximately 87,400 t.

<sup>5</sup> Information taken from the 2018 SAFE report for GOA northern rockfish: Hulson P-JF, Cunningham, CJ, Hanselman DH, Lunsford, CR (2018b) Assessment of the Northern Rockfish stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. Alaska Fisheries Science Center

**Table 12. Summary of GOA northern rockfish stock assessment outputs. Source: <https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAnork.pdf>**

Quantity	As estimated or specified <i>last</i> year for:		As estimated or recommended <i>this</i> year for:	
	2018	2019	2019*	2020*
<i>M</i> (natural mortality)	0.059	0.059	0.059	0.059
Tier	3a	3b	3a	3a
Projected total (age 2+ ) biomass (t)	74,748	73,814	87,409	84,326
Projected Female spawning biomass	28,017	26,512	36,365	34,046
<i>B</i> <sub>100%</sub>	69,957	69,957	76,199	76,199
<i>B</i> <sub>40%</sub>	27,983	27,983	30,480	30,480
<i>B</i> <sub>35%</sub>	24,485	24,485	26,670	26,670
<i>F</i> <sub>OFL</sub>	0.074	0.070	0.073	0.073
<i>maxF</i> <sub>ABC</sub>	0.062	0.058	0.061	0.061
<i>F</i> <sub>ABC</sub>	0.062	0.058	0.061	0.061
OFL (t)	4,380	3,984	<b>5,402</b>	5,093
maxABC (t)	3,685	3,350	4,529	4,270
ABC (t)	3,685	3,350	<b>4,529</b>	4,270
Status	As determined <i>last</i> year for:		As determined <i>this</i> year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

\*Projections are based on estimated catches of 3,219 t and 2,983 t used in place of maximum permissible ABC for 2019 and 2020.

#### GOA dusky rockfish<sup>6</sup>

Dusky rockfish are assessed on a biennial stock assessment schedule in odd years to coincide with the availability of new survey data. 2017 was the last full assessment for GOA dusky rockfish with an updated assessment and projection model results. A statistical age-structured model is used for GOA dusky rockfish, which qualifies as a Tier 3 stock. This assessment consists of a population model, which uses survey and fishery data to generate a historical time series of population estimates, and a projection model, which uses results from the population model to predict future population estimates and recommended harvest levels (Fenske et al. 2018). According to the 2017 assessment, overfishing is not occurring, the stock is not overfished, and it is not approaching an overfished condition (Figure 11). The 2015 estimate of total biomass for GOA dusky rockfish from the current assessment is approximately 55,200 t.

<sup>6</sup> Information taken from the 2017 SAFE report for GOA dusky rockfish: Lunsford CR, Fenske, KH, Shotwell SK, Hanselman DH (2017) Assessment of the dusky rockfish stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. Alaska Fisheries Science Center.

**Table 13. Summary of GOA dusky rockfish stock assessment outputs. Source: [https://www.afsc.noaa.gov/refm/stocks/plan\\_team/2018/GOAdusky.pdf](https://www.afsc.noaa.gov/refm/stocks/plan_team/2018/GOAdusky.pdf)**

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2018	2019	2019*	2020*
<i>M</i> (natural mortality rate)	0.07	0.07	0.07	0.07
Tier	3a	3a	3a	3a
Projected total (age 4+) biomass (t)	56,103	55,704	55,247	54,551
Female spawning biomass (t)	21,559	20,151	20,342	20,106
<i>B</i> <sub>100%</sub>	49,268	49,268	46,337	46,337
<i>B</i> <sub>40%</sub>	19,707	19,707	18,535	18,535
<i>B</i> <sub>35%</sub>	17,244	17,244	16,218	16,218
<i>F</i> <sub>OFL</sub>	0.121	0.121	0.118	0.118
<i>maxF</i> <sub>ABC</sub>	0.098	0.098	0.095	0.095
<i>F</i> <sub>ABC</sub>	0.098	0.098	0.095	0.095
OFL (t)	4,841	4,488	<b>4,521</b>	4,484
maxABC (t)	3,957	3,668	<b>3,700</b>	3,670
ABC (t)	3,957	3,668	<b>3,700</b>	3,670
<b>Status</b>	As determined last year for:		As determined this year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

\*Projections are based on an estimated catch of 2,946 t for 2018, and estimates of 2,303 t and 2,211 t used in place of maximum permissible ABC for 2019 and 2020.

## Fishery and management history

### BSAI Atka mackerel<sup>7</sup>

Annual catches of Atka mackerel in the BSAI region increased during the 1970s, reaching an initial peak in 1978 of around 24,000 t. Atka mackerel became a reported species group in the BSAI FMP in 1978. In 1970-1979, Atka mackerel were landed off Alaska exclusively by the distant water fleets of the Soviet Union, Japan, and the Republic of Korea. U.S. joint-venture fisheries began in 1980 and dominated the landings of Atka mackerel from 1982 through 1988. Total landings declined in 1980-1983 primarily due to changes in target species and allocations to various nations rather than changes in stock abundance. Catches increased quickly thereafter, and for 1985-1987, Atka mackerel catches averaged 34,000 t annually, dropping to a low of 18,000 t in 1989. The last joint-venture allocation of Atka mackerel off Alaska was in 1989, and since 1990, all Atka mackerel landings have been made by U.S. fishers. Beginning in 1992, TACs increased steadily in response to evidence of a large exploitable biomass, particularly in the central and western AI.

### BSAI Pacific Ocean perch<sup>8</sup>

Pacific Ocean perch were a desirable species to the Japanese and Soviets and supported a major trawl fishery throughout the 1960s. Catches in the EBS peaked at 47,000 t in 1961; the peak catch in the AI region was 109,100 t in 1965. The Pacific Ocean perch stock was not productive enough to support such large removals. Catches continued to decline throughout the 1960s and 1970s, reaching their lowest levels in the mid-1980s. With the gradual phase-out of the foreign fishery after the implementation of the 200-mile U.S. EEZ, a small joint-venture fishery was developed but was soon replaced by a domestic fishery by 1990. In 1990, the domestic fishery recorded the highest removals of Pacific Ocean perch since 1977.

Estimates of retained and discarded Pacific Ocean perch from the fishery have been available since 1990. For 1990-2009, the EBS region generally showed a higher discard rate than in the AI region, with the average rates 33% and

<sup>7</sup> Information taken from the 2018 SAFE report for BSAI Atka mackerel: Lowe S, Ianelli JN, Palsen W (2018) Assessment of the Atka mackerel stock in the Bering Sea/Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE.

<sup>8</sup> Information taken from the 2016 SAFE report for BSAI Pacific Ocean perch: Spencer PD, Ianelli JN (2016) Assessment of the Pacific Ocean perch stock in the Bering Sea/Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. Alaska Fisheries Science Center.

14%, respectively. For 2010-2016, the EBS and the AI discard rate were low, averaging 10% and 1% respectively. In 2017 and 2018, the discard rates in the AI area increased to 22% and 32% respectively.

#### *GOA Pacific Ocean perch*<sup>9</sup>

The Soviet Union and Japan had a trawl fishery for Pacific Ocean perch in the GOA in the early 1960s that developed rapidly under massive efforts by both countries' fleets. Catches peaked in 1965, when a total of nearly 350,000 t was caught. This apparent overfishing resulted in a steep decline in catches in the late 1960s. Catches continued to decline in the 1970s, and by 1978, catches were only 8,000 t. Foreign fishing continued to dominate the fishery until 1984, and catches were generally in decline through the mid-1980s. Most of the catch was taken by Japan (Carlson et al. 1986). Catches reached the lowest point in 1985, after which foreign trawling in the GOA was prohibited.

The domestic fishery first became important in 1985 and expanded each year until 1991. Much of the expansion of the domestic fishery was apparently related to increasing annual quotas; quotas increased from 3,702 t in 1986 to 20,000 t in 1989. In the years 1991-1995, overall catches of slope rockfish diminished due to more restrictive management policies instated during this period. The restrictions included: (1) establishment of management subgroups, limiting harvest of more desirable species; (2) reduction of the TAC to promote rebuilding of Pacific Ocean perch stocks; and (3) conservative in-season management practices in which fisheries were sometimes closed even though substantial unharvested TAC remained. Closures were necessary because, given the large fishing power of the rockfish trawl fleet, there was substantial risk of exceeding the TAC if the fishery were to remain open. Since 1996, catches of Pacific Ocean perch have increased again, as good recruitment and increasing biomass for this species have resulted in larger TACs.

Historically, bottom trawls have accounted for nearly all the commercial harvest of Pacific Ocean perch. However, in recent years, pelagic trawls have taken a substantial portion (~30% in 2008) of the Pacific Ocean perch catch. Prior to 1996, most of the Pacific Ocean perch trawl catch (>90%) was taken by large factory trawlers that processed the fish at sea. In 1996, smaller shore-based trawlers began taking about 50% of the catch from the central GOA for delivery to processing plants in Kodiak. By 2008, this proportion increased to 60% of the catch in the central GOA and 35% in the West Yakutat area. Factory trawlers continue to take nearly all the catch in the western GOA.

In 2007, the Central GOA Rockfish Program was implemented to enhance resource conservation and improve economic efficiency for harvesters and processors who participate in the central GOA rockfish fishery. This rationalization program establishes cooperatives among trawl vessels and processors, which receive exclusive harvest privileges for rockfish management groups. The primary rockfish management groups are northern rockfish, Pacific Ocean perch, and pelagic shelf rockfish.

There is evidence that the rockfish fishery has changed over time and is more focused on younger fish and fishing with smaller vessels. Overall, it would appear that there are trends in the data to support that the fishery is more focused on middle-aged fish rather than older fish in recent years. Further analysis would be needed to do some comparisons of the catch at age of other slope rockfish and to further examine length compositions from the foreign fleet.

#### *BSAI northern rockfish*<sup>10</sup>

BSAI foreign and joint-venture rockfish catch records from 1977 to 1989 are available from foreign "blend" estimates of total catch by management group and observed catches from the North Pacific Observer Program database. Japanese trawlers took most of the foreign catch of BSAI rockfish during this time, whereas the joint-venture fisheries involved partnerships with the Republic of Korea. Because northern rockfish are taken as bycatch in the BSAI area, historical foreign catch records have not identified northern rockfish catch by species. Instead, northern rockfish catch has been reported in a variety of categories such as "other species" (1977, 1978), "Pacific Ocean perch complex" (1979-1985, 1989), and "rockfish without Pacific Ocean perch" (1986-1988).

Rockfish management categories in the domestic fishery since 1991 have also included multiple species. In 1991, the "other red rockfish" species group was used in both the EBS and AI, but beginning in 1992, northern rockfish in the AI were managed in the "northern/sharpchin" species group. Prior to 2001, northern rockfish were managed with

<sup>9</sup> Information taken from the 2017 SAFE report for GOA Pacific Ocean perch: Hulson P-JF, Hanselman DH, Shotwell SK, Lunsford CR, Ianelli JN (2017) Assessment of the Pacific Ocean perch stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. Alaska Fisheries Science Center.

<sup>10</sup> Information taken from the 2018 SAFE report for BSAI northern rockfish: Spencer PD, Ianelli JN (2018) Assessment of the Northern Rockfish stock in the Bering Sea/Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. Alaska Fisheries Science Center



separate ABCs and TACs for the AI and EBS, and in 2001, the two areas were combined into a single management unit under the “sharpchin/northern” species complex. In 2002, sharpchin rockfish were dropped from the complex because of their sparse catches, leaving the single species management category of northern rockfish.

Northern rockfish catch prior to 1990 was small relative to more recent years (with the exception of 1977 and 1978). Harvest data for 2004-2010 indicate that approximately 88% of the BSAI northern rockfish are harvested in the Atka mackerel fishery. Prior to 2011, much of the northern rockfish catch occurred in the western and central AI, reflecting the high proportion of Atka mackerel fishing in these areas. However, restrictions on Atka mackerel fishing in the western AI beginning in 2011 have restricted the current northern rockfish harvest in this area, and in 2011-2014, the proportion of northern rockfish harvested in the Atka mackerel fishery declined to 55%. Northern rockfish are patchily distributed and are harvested in relatively few areas within the broad management subareas of the AI.

Information on proportion discarded is generally not available for northern rockfish in years where the management categories consist of multi-species complexes. However, because the catches of sharpchin rockfish are generally rare in both the fishery and survey, the discard information available for the “sharpchin/northern” complex can be interpreted as northern rockfish discards. This management category was used in 2001 in the EBS and for 1993-2001 in the AI. Prior to 2003, the discard rates were generally above 80%, with the exception of the mid-1990s when some targeting occurred in the AI. Discard rates in the AI have declined from 96% in 2003 to <10% in 2013 and 2014. In the AI, discard rates have declined from 80% in 2003 to <10% in 2010 and increased in year to 50% in 2012 and 46% in 2014.

#### *GOA northern rockfish*<sup>11</sup>

In the GOA, northern rockfish are typically caught with bottom trawls identical to those used in the Pacific Ocean perch fishery. Prior to the implementation of the Rockfish Pilot Program (RPP) in 2007, most of the catch was taken during July, as the directed rockfish trawl fisheries in the GOA traditionally opened around July 1 prior to the RPP. With implementation of the Central Gulf RPP in 2007, catches have been spread out more throughout the year (season dates are May 1 to November 15). There is evidence that the rockfish fishery has changed over time and the proportion of older fish in the catch has been increasing since the mid to early 2000s.

Historically, bottom trawls have accounted for nearly all the commercial harvest of northern rockfish in the GOA. In the years 1990-1998, bottom trawls took over 99% of the catch (Clausen & Heifetz 2002). Before 1996, most of the slope rockfish trawl catch (>90%) was taken by large factory trawlers that processed the fish at sea. A significant change occurred in 1996, however, when smaller shore-based trawlers began taking a sizeable portion of the catch in the central GOA for delivery to processing plants in Kodiak. Factory trawlers continued to take nearly all the northern rockfish catch in the western GOA during this period.

As noted above, in 2007, the Central GOA RPP (since 2012, known as the Rockfish Program) was implemented to enhance resource conservation and improve economic efficiency for harvesters and processors who participate in the central GOA rockfish fishery. This rationalization program establishes cooperatives among trawl vessels and processors, which receive exclusive harvest privileges for rockfish management groups. The primary rockfish management groups are northern rockfish, Pacific Ocean perch, and dusky rockfish.

#### *GOA dusky rockfish*<sup>12</sup>

Dusky rockfish are managed as a separate stock in the GOA FMP. There are three management areas in the GOA: western, central, and eastern. The eastern area is further divided into West Yakutat and East Yakutat/Southeast Outside management units so as to account for the trawl prohibition in the East Yakutat/Southeast Outside area (east of 140° W longitude) created by Amendment 41.

Dusky rockfish are caught almost exclusively with bottom trawls in the central and western areas of the GOA. Catches of dusky rockfish are condensed to a number of relatively shallow, offshore banks of the outer continental shelf. Highest catch-per-unit-effort in the commercial fishery is generally at depths of 100-150m. From 1988 to 1995, large factory trawlers that processed fish at sea caught the majority of dusky rockfish (>95%). In 1996, smaller shore-based trawlers also began taking a sizeable portion of the catch in the central GOA for delivery to processing plants in

<sup>11</sup> Information taken from the 2018 SAFE report for GOA northern rockfish: Hulson P-JF, Cunningham, CJ, Hanselman DH, Lunsford, CR (2018b) Assessment of the Northern Rockfish stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. Alaska Fisheries Science Center

<sup>12</sup> Information taken from the 2015 SAFE report for GOA dusky rockfish: Lunsford CR, Hulson P-JF, Shotwell SK, Hanselman DH (2015) Assessment of the dusky rockfish stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. Alaska Fisheries Science Center



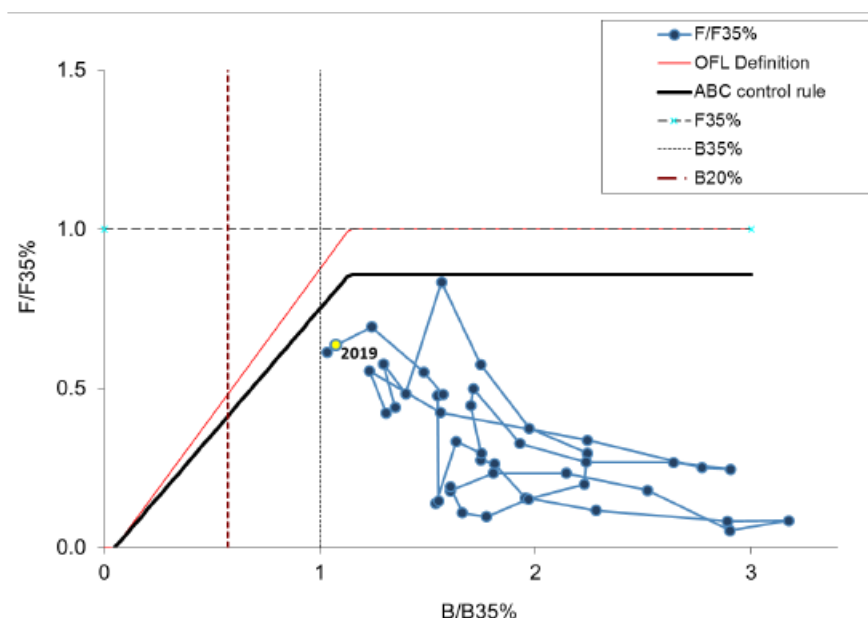
Kodiak.

The Central GOA RPP allocated the rockfish quota by sector so the percentage of 2007-present catches by shore-based catcher vessels differs in comparison to previous years. One benefit realized from the Rockfish Program is increased observer coverage and sampled catch for trips that target dusky rockfish. Since the majority of dusky rockfish catch comes from the central GOA, the effects of the Rockfish Program have implications on the spatial distribution of dusky rockfish catch. In a study on localized depletion of Alaskan rockfish, Hanselman et al. (2007) found that dusky rockfish were rarely depleted in areas 5,000-10,000 km<sup>2</sup>. Comparison of spatial distribution of the dusky rockfish catch before and after the Rockfish Program began did not show major changes in catch distribution. Interpreting this data is confounded; however, it is unclear if results are attributable to changes in effort or observer coverage.

## 5.2.1 Catch profiles

### *BSAI Atka Mackerel*

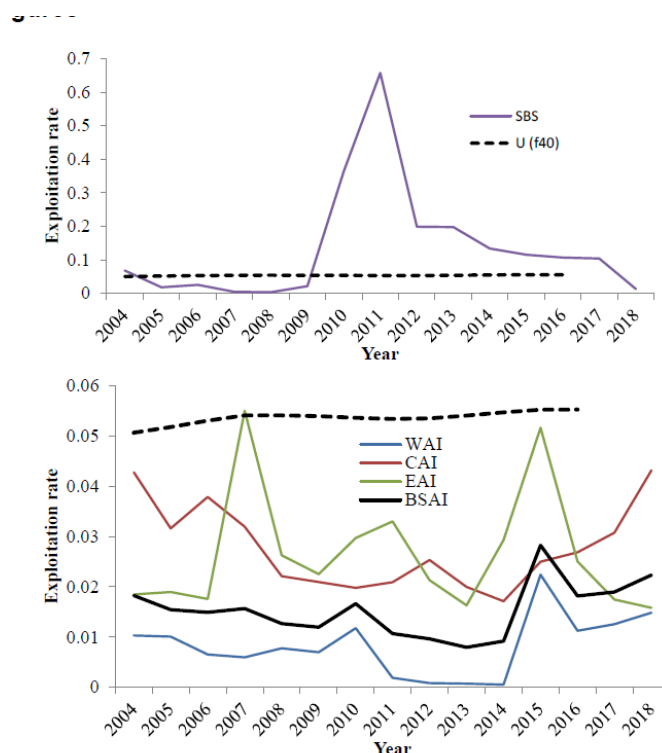
The official catch estimate for the most recent complete year (2017) is 64,451 t. This is less than the 2017 OFL of 107,200 t. Therefore, the BSAI Atka mackerel stock is not being subject to overfishing. Figure 1 shows the history of stock status for this stock relative to biomass (B) and F reference points, demonstrating there is a high degree of certainty the stock is above the point of recruitment impairment (PRI).



**Figure 1. SSB for BSAI Atka mackerel relative to  $B_{35\%}$  and F relative to  $F_{OFL}$  (1977-2020). The ratio of F to  $F_{OFL}$  is calculated using the estimated selectivity pattern in that year. Estimates of SSB and  $B_{35\%}$  are based on current estimates of weight-at-age and mean recruitment. Because these estimates change as new data become available, this figure can only be used in a general way to evaluate management performance relative to biomass and fishing mortality reference levels.**

### *BSAI Northern Rockfish*

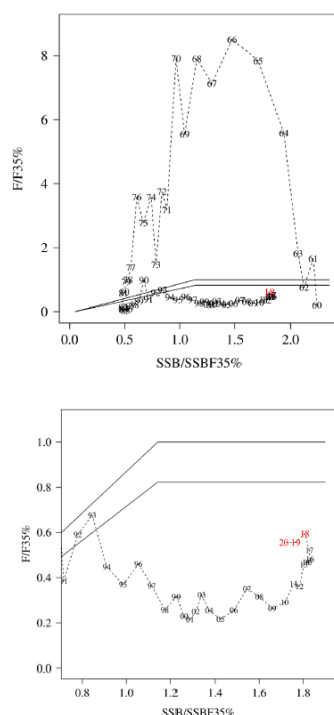
According to the 2018 stock assessment, BSAI northern rockfish was not subjected to overfishing in 2017 and is not overfished or approaching an overfished condition. BSAI northern rockfish exploitation rates have averaged 0.015 from 2004-2018, which is below the exploitation rate associated from fishing at  $F_{40\%}$  (defined as  $U_{F40\%}$ ). Exploitation rates are computed as the ratio of catch within a year to the beginning year biomass (ages 3+). The estimates of biomass for 2017 and 2018 were updated from re-running the projection model with updated catch data, where biomass estimate for other years were obtained from the 2016 stock assessment. Exploitation rates for BSAI subareas were obtained by using smoothed estimates of survey biomass from the random effects models to spatially partition the estimated total biomass. In general, exploitation rates from the BSAI subareas are also below  $U_{F40\%}$ . Since 2015, the exploitation rates in the eastern AI have been decreasing whereas those in the central AI have been increasing. The biomass estimates in the southern BS area are not viewed as reliable due to relatively large standard deviations and high variability between years, which accounts for the unusually high exploitation rates from 2009-2017. Figure 2 shows the stock status relative to reference points (control rule).



**Figure 2. Exploitation rates of BSAI northern rockfish.**The  $U_{F40\%}$  is the exploitation rate for each year that would occur from fishing at  $F_{40\%}$  and is a function of the beginning year numbers at age, size at age, and fishing selectivity. The high exploitation rates in the southern BS area result from high variable survey biomass estimates for this area. Exploitation rates for 2018 are preliminary and based on catch through October 6, 2018.

#### *BSAI Pacific Ocean Perch*

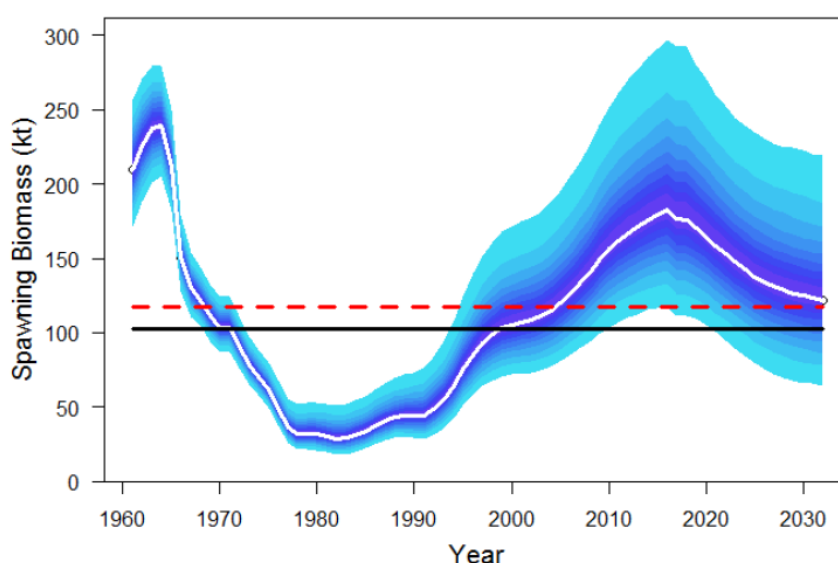
According to the 2018 stock assessment, BSAI Pacific Ocean perch is not overfished nor subject to overfishing. The plot of estimated  $F$  rates and SSB relative to the HCRs (Figure 3) indicate that BSAI Pacific Ocean perch would be considered overfished (using current definitions) during much of the period from the mid-1960s to the mid-1980s, although it should be noted the current definitions of  $B_{35\%}$  are based on the estimated recruitment of the post-1977 year classes and the average fishery selectivity from the most recent 5 years.



**Figure 3. (Top panel) Estimated fishing mortality and SSB for BSAI Pacific Ocean perch in reference to OFL (upper line) and ABC (lower line) HCRs with 2018 shown in red. The bottom panel shows a reduced vertical scale and the projected F and stock size for 2019 and 2020.**

#### GOA Pacific Ocean Perch

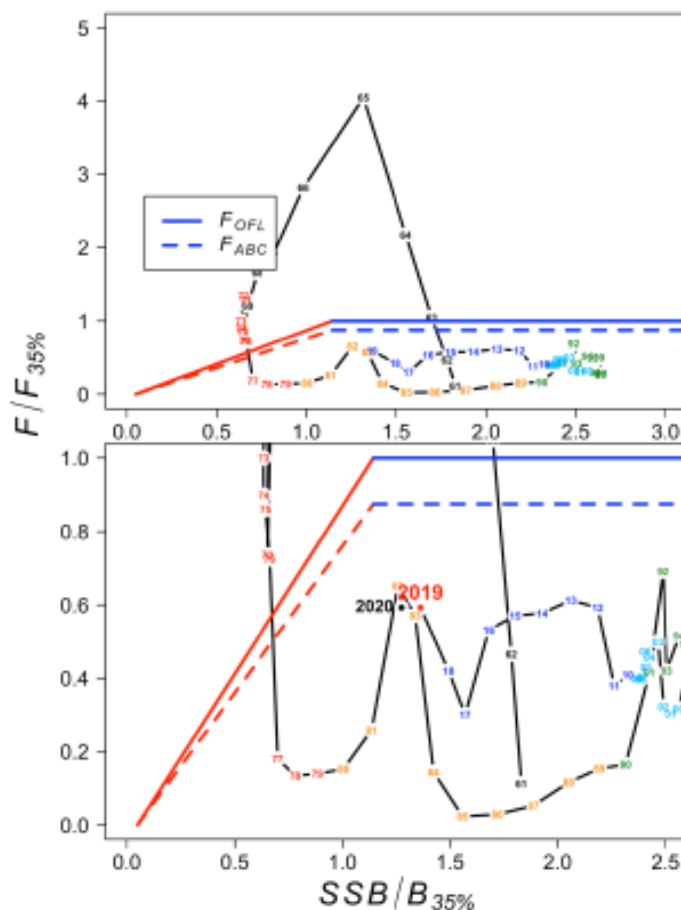
According to the 2018 stock assessment, this stock is not overfished nor is overfishing occurring. As 2018 is an intermediate year on the biennial stock assessment cycle, new data was added to the existing model but no changes to the model were made. Although there is a single stock assessment covering this area, there is still spatial management of harvest. Figure 4 shows the historical and projected SSB from the 2017 stock assessment. It is therefore highly likely this stock is above the PRI but there is not a high degree of certainty that it has been fluctuating around an MSY consistent level over above over recent years.



**Figure 4. Bayesian credible intervals for GOA Pacific Ocean perch entire SSB series including projections through 2030. Red dashed line is  $B_{40\%}$  and black solid line is  $B_{35\%}$  based on recruitments from 1979-2013. The white line is the median of MCMC simulations. Each shade is 5% of the posterior distribution.**

## GOA Northern Rockfish

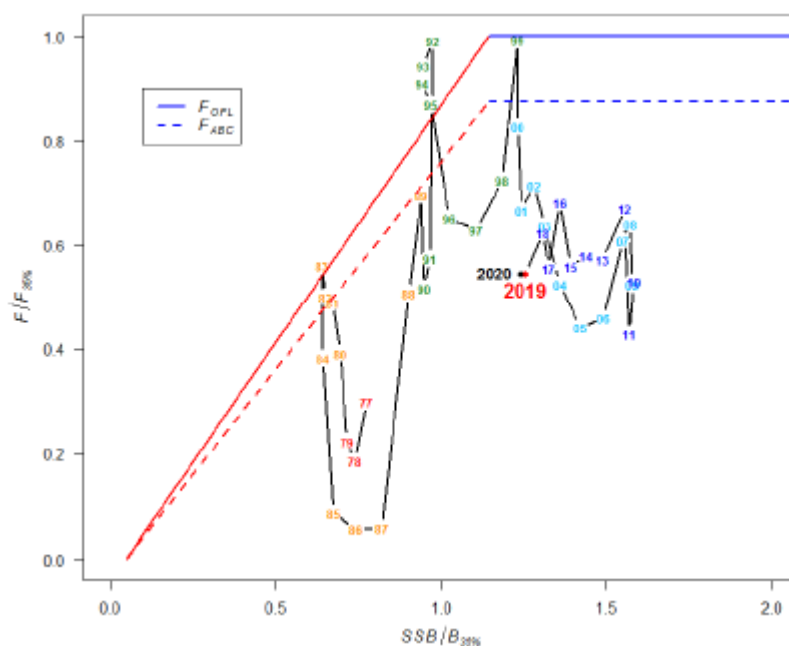
According to the 2018 stock assessment, this stock is not overfished nor experiencing overfishing. It is highly likely to be above the PRI and there is a high degree of certainty that it has been fluctuating around an MSY consistent level or above in recent years. HCRs based on  $F_{35\%}$  and  $F_{40\%}$  and the Tier 3b adjustment are provided for reference. The historical management path for northern rockfish has been above the  $F_{OFL}$  adjusted limit for only a few years in the 1960s. In recent years, northern rockfish have been above  $B_{35\%}$  and below  $F_{35\%}$  (Figure 5). The trajectory of fishing mortality has remained below the  $F_{40\%}$  level most of the time and below  $F_{35\%}$  in all years except 1964-1966 during the period of intense fishing for Pacific Ocean perch. Selectivity estimates for the fishery and the survey are similar, but with the survey selectivity increasing somewhat more gradually with age. Compared to the maturity at age curve that is estimated, selectivity occurs at slightly younger ages than the age of maturity (Figure 5).



**Figure 5.** Time series of GOA northern rockfish estimated SSB relative to  $B_{35\%}$  and  $F$  relative to  $F_{35\%}$  for author recommended model.

## GOA Dusky Rockfish

According to the 2018 stock assessment, GOA dusky rockfish is not overfished nor experiencing overfishing. There is a high degree of certainty that the stock is above the PRI and is fluctuating around or above MSY consistent reference points and has been for several years. HCRs based on  $F_{35\%}$  and  $F_{40\%}$  and the Tier 3b adjustment are provided for reference. The historical management path for dusky rockfish has been above the  $F_{OFL}$  adjusted limit for only a few years in the early 1980s and early 1990s. Since 2000, dusky rockfish have been above  $B_{40\%}$  and well below  $F_{40\%}$  (Figure 6).



**Figure 6. Time series of GOA dusky rockfish estimated SSB relative to the unfished level and F relative to  $F_{OFL}$  for the 2018 model.**

## 5.2.2 TAC and catch data

### BSAI Pacific Ocean Perch

TAC	Year	<b>2018</b>	Amount	<b>37361 mt</b>
UoA share of TAC	Year	<b>2018</b>	Amount	<b>37361 mt</b>
UoA share of total TAC	Year	<b>2018</b>	Amount	<b>37361 mt</b>
Total green weight catch by UoC	Year (most recent)	<b>2018</b>	Amount	<b>34749 mt</b>
Total green weight catch by UoC	Year (second most recent)	<b>2017</b>	Amount	<b>32543 mt</b>

### GOA Pacific Ocean Perch

TAC	Year	<b>2018</b>	Amount	<b>29236 mt</b>
UoA share of TAC	Year	<b>2018</b>	Amount	<b>29236 mt</b>
UoA share of total TAC	Year	<b>2018</b>	Amount	<b>29236 mt</b>
Total green weight catch by UoC	Year (most recent)	<b>2018</b>	Amount	<b>24723 mt</b>
Total green weight catch by UoC	Year (second most recent)	<b>2017</b>	Amount	<b>23881 mt</b>

### BSAI Northern Rockfish

TAC	Year	<b>2018</b>	Amount	<b>6100 mt</b>
UoA share of TAC	Year	<b>2018</b>	Amount	<b>6100 mt</b>
UoA share of total TAC	Year	<b>2018</b>	Amount	<b>6100 mt</b>
Total green weight catch by UoC	Year (most recent)	<b>2018</b>	Amount	<b>5767 mt</b>
Total green weight catch by UoC	Year (second most recent)	<b>2017</b>	Amount	<b>4699 mt</b>

### GOA Northern Rockfish

TAC	Year	<b>2018</b>	Amount	<b>3685 mt</b>
UoA share of TAC	Year	<b>2018</b>	Amount	<b>3685 mt</b>
UoA share of total TAC	Year	<b>2018</b>	Amount	<b>3685 mt</b>
Total green weight catch by UoC	Year (most recent)	<b>2018</b>	Amount	<b>2354 mt</b>
Total green weight catch by UoC	Year (second most recent)	<b>2017</b>	Amount	<b>1836 mt</b>

#### BSAI Atka Mackerel

TAC	Year	<b>2018</b>	Amount	<b>71000 mt</b>
UoA share of TAC	Year	<b>2018</b>	Amount	<b>71000 mt</b>
UoA share of total TAC	Year	<b>2018</b>	Amount	<b>71000 mt</b>
Total green weight catch by UoC	Year (most recent)	<b>2018</b>	Amount	<b>70393 mt</b>
Total green weight catch by UoC	Year (second most recent)	<b>2017</b>	Amount	<b>64451 mt</b>

#### GOA Dusky Rockfish

TAC	Year	<b>2018</b>	Amount	<b>3957 mt</b>
UoA share of TAC	Year	<b>2018</b>	Amount	<b>3957 mt</b>
UoA share of total TAC	Year	<b>2018</b>	Amount	<b>3957 mt</b>
Total green weight catch by UoC	Year (most recent)	<b>2018</b>	Amount	<b>2909 mt</b>
Total green weight catch by UoC	Year (second most recent)	<b>2017</b>	Amount	<b>2623 mt</b>

## 5.2.3 Principle 1 Performance Indicator scores and rationales

### PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Stock status relative to recruitment impairment			
	Guide post	It is <b>likely</b> that the stock is above the point where recruitment would be impaired (PRI).	It is <b>highly likely</b> that the stock is above the PRI.	There is a <b>high degree of certainty</b> that the stock is above the PRI.
	Met?	BSAI Atka: Y BSAI Northern: Y BSAI POP: Y GOA POP: Y GOA Northern: Y GOA Dusky: Y	BSAI Atka: Y BSAI Northern: Y BSAI POP: Y GOA POP: Y GOA Northern: Y GOA Dusky: Y	BSAI Atka: Y BSAI Northern: Y BSAI POP: Y GOA POP: Y GOA Northern: Y GOA Dusky: Y
Rationale				

#### BSAI Atka Mackerel

The official catch estimate for the most recent complete year (2017) is 64,451 t. This is less than the 2017 OFL of 107,200 t. Therefore, the BSAI Atka mackerel stock is not being subject to overfishing. Figure 2.7.2.1 shows the history of stock status for this stock relative to biomass and fishing mortality reference points. According to the MSC Fisheries Certification Requirements and Guidance v2.0 GSA2.2.3.1, in the case where neither  $B_{MSY}$  nor the PRI are analytically determined, the following default reference points may be appropriate for measuring stock status depending on the species:  $B_{MSY}=40\%B_0$ ;  $PRI=20\%B_0=\frac{1}{2}B_{MSY}$ , where  $B_0$  is the virgin biomass or non-exploited biomass. Therefore, PRI can be considered around 60 mt (half of  $B_{40\%}$  as reported in Table 7.2.1.1). Taking into account that the 2018 projected total (age 1+) biomass (t) is equal to 505 mt and the lower 95% confidence bounds is 297 mt (see Table 17.13a. in <https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIatka.pdf>), it is possible to conclude that there is a high degree of certainty that the stock is above the PRI. Therefore, SG60, SG80, and SG100 are met.

#### BSAI Northern Rockfish

According to the 2018 stock assessment, BSAI northern rockfish was not subjected to overfishing in 2017 and is not overfished or approaching an overfished condition. BSAI northern rockfish exploitation rates have averaged 0.015 from 2004-2018, which is below the exploitation rate associated from fishing at  $F_{40\%}$  (defined as  $UF_{40\%}$ ). Exploitation rates are computed as the ratio of catch within a year to the beginning year biomass (ages 3+). The estimates of biomass for 2017 and 2018 were updated from re-running the projection model with updated catch data, where biomass estimate for other years were obtained from the 2016 stock assessment. Exploitation rates for BSAI subareas were obtained by using smoothed estimates of survey biomass from the random effects models to spatially partition the estimated total biomass. In general, exploitation rates from the BSAI subareas are also below  $UF_{40\%}$ . Since 2015, the exploitation rates in the eastern AI have been decreasing whereas those in the central AI have been increasing (Figure 7.2.2.2). According to the MSC Fisheries Certification Requirements and Guidance v2.0 GSA2.2.3.1, in the case where neither  $B_{MSY}$  nor the PRI are analytically determined, the following default reference points may be appropriate for measuring stock status depending on the species:  $B_{MSY}=40\%B_0$ ;  $PRI=20\%B_0=\frac{1}{2}B_{MSY}$ , where  $B_0$  is the virgin biomass or non-exploited biomass. Therefore, PRI can be considered around 33 mt (half of  $B_{40\%}$ , Table 2.7.1.2). Taking into account that the 2018 projected total (age 3+) biomass (t) is equal to 246 mt and the coefficient of variation is around 10% (see Table 13 in <https://www.afsc.noaa.gov/REFM/Docs/2016/BSAInork.pdf>), it is possible to conclude that there is a high degree of certainty that the stock is above the PRI. Therefore, SG60, SG80, and SG100 are met.

#### BSAI Pacific Ocean Perch

According to the 2018 stock assessment, BSAI Pacific Ocean perch is not overfished nor subject to overfishing. Figure 2.7.2.3 shows the status of the stock over recent years compared to  $B_{MSY}$  and  $F_{MSY}$  (control rule reference

points). According to the MSC Fisheries Certification Requirements and Guidance 2.0 - GSA2.2.3.1, in the case where neither B<sub>MSY</sub> nor the PRI are analytically determined, the following default reference points may be appropriate for measuring stock status depending on the species: B<sub>MSY</sub>=40%B<sub>0</sub>; PRI=20%B<sub>0</sub>=½B<sub>MSY</sub>, where B<sub>0</sub> is the virgin biomass or non-exploited biomass. Therefore, PRI can be considered around 107 mt (half of B<sub>40%</sub>, Table 2.7.1.3). Taking into account that the 2018 projected total (age 3+) biomass (t) is equal to 750 mt and coefficient of variation is around 16% (see Table 12.14 in <https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIPop.pdf>), it is possible to conclude that there is a high degree of certainty that the stock is above the PRI. Therefore, SG60, SG80, and SG100 are met.

#### GOA Pacific Ocean Perch

According to the 2018 stock assessment, this stock is not overfished nor is overfishing occurring. As 2018 is an intermediate year on the biennial stock assessment cycle, new data was added to the existing model but no changes to the model were made. Although there is a single stock assessment covering this area, there is still spatial management of harvest. Figure 2.7.2.4 shows the historical and projected SSB from the 2017 stock assessment. According to the MSC Fisheries Certification Requirements and Guidance v2.0 GSA2.2.3.1, in the case where neither B<sub>MSY</sub> nor the PRI are analytically determined, the following default reference points may be appropriate for measuring stock status depending on the species: B<sub>MSY</sub>=40%B<sub>0</sub>; PRI=20%B<sub>0</sub>=½B<sub>MSY</sub>, where B<sub>0</sub> is the virgin biomass or non-exploited biomass. Therefore, PRI can be considered around 57 mt (half of B<sub>40%</sub>, Table 7.2.1.4). Taking into account that the 2018 projected total (age 2+) biomass (t) is equal to 511 mt and the lower 95% confidence bounds is 334 mt (see Table 9-18 in <https://www.afsc.noaa.gov/REFM/Docs/2017/GOAPop.pdf>), it is possible to conclude that there is a high degree of certainty that the stock is above the PRI. Therefore, SG60, SG80, and SG100 are met

#### GOA Northern Rockfish

According to the 2018 stock assessment, this stock is not overfished nor experiencing overfishing. According to the MSC Fisheries Certification Requirements and Guidance v2.0 GSA2.2.3.1, in the case where neither B<sub>MSY</sub> nor the PRI are analytically determined, the following default reference points may be appropriate for measuring stock status depending on the species: B<sub>MSY</sub>=40%B<sub>0</sub>; PRI=20%B<sub>0</sub>=½B<sub>MSY</sub>, where B<sub>0</sub> is the virgin biomass or non-exploited biomass. Therefore, PRI can be considered around 14 mt (half of B<sub>40%</sub>, Table 7.2.1.5). Taking into account that the 2018 projected total (age 2+) biomass (t) is equal to 90 mt and the lower 95% confidence bounds is 41 mt (see Table 10.14 in <https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnork.pdf>), it is possible to conclude that there is a high degree of certainty that the stock is above the PRI. Therefore, SG60, SG80, and SG100 are met.

#### GOA Dusky Rockfish

According to the 2018 stock assessment, GOA dusky rockfish is not overfished nor experiencing overfishing. According to the MSC Fisheries Certification Requirements and Guidance v2.0 GSA2.2.3.1, in the case where neither B<sub>MSY</sub> nor the PRI are analytically determined, the following default reference points may be appropriate for measuring stock status depending on the species: B<sub>MSY</sub>=40%B<sub>0</sub>; PRI=20%B<sub>0</sub>=½B<sub>MSY</sub>, where B<sub>0</sub> is the virgin biomass or non-exploited biomass. Therefore, PRI can be considered around 10 mt (half of B<sub>40%</sub>, Table 7.2.1.6). Taking into account that the 2018 projected total (age 4+) biomass (t) is equal to 57 m and the lower 95% confidence bounds is 43 mt (see Table 12.15 in <https://www.afsc.noaa.gov/REFM/Docs/2018/GOAdusky.pdf>), it is possible to conclude that there is a high degree of certainty that the stock is above the PRI. Therefore, SG60, SG80, and SG100 are met.

### Stock status in relation to achievement of Maximum Sustainable Yield (MSY)

b	Guide post	The stock is at or fluctuating around a level consistent with MSY.	There is a <b>high degree of certainty</b> that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?	BSAI Atka: Y BSAI Northern: Y BSAI POP: Y GOA POP: Y GOA Northern: Y GOA Dusky: Y	BSAI Atka: Y BSAI Northern: Y BSAI POP: Y GOA POP: Y GOA Northern: Y GOA Dusky: Y

#### Rationale



The BMSY levels are not analytical determined in the 6 stocks reported above. However, the B40% can be considered an acceptable proxy for BMSY (see MSC certification MSC Fisheries Certification Requirements and Guidance 2.0 - GSA2.2.3.1). Therefore, taking into account the values reported above it is possible to conclude that there is an high degree of certainty that the stocks have been above level consistent with MSY over recent years.

## References

2018 SAFE report for BSAI Atka mackerel: Lowe S, Ianelli JN, Palsson W;  
 2016 SAFE report for BSAI Pacific Ocean perch: Spencer PD, Ianelli JN;  
 2016 SAFE report for BSAI Northern rockfish: Spencer PD, Ianelli JN;  
 2017 SAFE report for GOA Pacific Ocean perch; 2014 SAFE report for BSAI northern rockfish;  
 2018 SAFE report for GOA northern rockfish: Hulson P-JF, Cunningham, CJ, Hanselman DH, Lunsford, CR (2018b);  
 2017 SAFE report for GOA dusky rockfish: Lunsford CR, Fenske, KH, Shotwell SK, Hanselman DH

## Stock status relative to reference points

	Type of reference point	Point of Recruitment Impairment	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	B20%	BSAI Atka: 60 BSAI Northern:33 BSAI POP: 107 GOA POP: 57 GOA Northern:14 GOA Dusky: 10	BSAI Atka: 8.4 BSAI Northern: 7.4 BSAI POP: 7 GOA POP: 8.9 GOA Northern: 6.4 GOA Dusky: 5.7
Reference point used in scoring stock relative to MSY (SIb)	B40%	BSAI Atka: 120 BSAI Northern: 66 BSAI POP: 214 GOA POP: 114 GOA Northern: 28 GOA Dusky: 20.	BSAI Atka: 4.2 BSAI Northern: 3.7 BSAI POP: 3.5 GOA POP: 4.4 GOA Northern: 3.2 GOA Dusky: 2.8

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>All stocks: ≥80</b>
Information gap indicator	<b>All stocks: More information sought to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All Stocks: 100</b>
Condition number (if relevant)	

## PI 1.1.2 – Stock rebuilding

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Rebuilding timeframes			
	Guide post	A rebuilding timeframe is specified for the stock that is the <b>shorter of 20 years or 2 times its generation time</b> . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed <b>one generation time</b> for the stock.
	Met?	<b>N/A</b>		<b>N/A</b>
Rationale				

The stocks are not reduced.

<b>b</b>	Rebuilding evaluation			
	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is <b>evidence</b> that the rebuilding strategies are rebuilding stocks, <b>or it is likely</b> based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the <b>specified timeframe</b> .	There is <b>strong evidence</b> that the rebuilding strategies are rebuilding stocks, <b>or it is highly likely</b> based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the <b>specified timeframe</b> .
	Met?	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Rationale				

The stocks are not reduced.

## References

List any references here, including hyperlinks to publicly-available documents.

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>N/A</b>
Information gap indicator	<b>N/A</b>

## Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>N/A</b>
Condition number (if relevant)	

## PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Harvest strategy design			
	Guide post	The harvest strategy is <b>expected</b> to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <b>work together</b> towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is <b>designed</b> to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	<b>All stocks: N</b>
Rationale				

For the 6 stocks considered the harvest strategy is constituted by a well detailed data collection programme (see: [https://www.afsc.noaa.gov/FMA/fma\\_database.htm](https://www.afsc.noaa.gov/FMA/fma_database.htm), robust stock assessment programs carried out in the framework of North Pacific Groundfish SAFE Program (see <https://www.fisheries.noaa.gov/alaska/population-assessments/north-pacific-groundfish-stock-assessment-and-fishery-evaluation>), well-defined HCRs characterized by standard set of projections, conducted for each stock managed under Tier 3 of Amendment 56.

This set of projections encompasses seven harvest scenarios designed to satisfy the requirements of Amendment 56, NEPA, and the MSFCMA. The scenarios consider the current levels of exploitation in the UoA, measured by fishing mortality and harvest rates (see paragraph “Stock assessment” in 7.2.1). Therefore, it is possible to conclude that the harvest strategy is expected to maintain stocks above  $B_{MSY}$  or proxy, because the TAC level is decided according to the status of the stock and the harvest rate.

Based on these scenarios, these UoAs are neither overfished nor approaching an overfished condition and are therefore achieving the objectives of maintaining stocks at and above target levels. The stock assessments are conducted regularly (every other year) to ensure that the harvest strategy is working, and the harvest strategy is periodically reviewed and improved as necessary. Therefore, the harvest strategy is responsive to the state of the stocks and the various elements (data collection, observe programmes, stock assessment, etc.) are clearly keeping the stock above MSY levels. Therefore, SG60 and SG80 are met.

However, for Tier 3 stocks, the MSY level is defined as  $B_{35\%}$ . According to the FCR Guidance v2.0 in GSA2.2.3.1  $B_{MSY}=40\%B_0$ , then it is not possible to conclude the harvest strategy is completely designed to achieve stock management objectives reflected in Performance Indicator (PI) 1.1.1 SG80. Therefore, SG100 is not met.

Harvest strategy evaluation				
<b>b</b>	Guide post	The harvest strategy is <b>likely</b> to work based on prior experience or plausible argument.	The harvest strategy may not have been fully <b>tested</b> but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been <b>fully evaluated</b> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	<b>All stocks: N</b>
Rationale				

The harvest strategy has been evaluated in a general way. The rules have not been operationally tested with this stock, because recruitment has been above average and fishable and SSB have been increasing for the entire time the current management system has been for all the 6 stocks. However, the same control rules are applied for all Tier 3 stocks and in stocks that have had periods of lower than average productivity, they have consistent performed as

intended (for example, GOA Pacific cod – see MRAG Americas 2015). In those cases, it has proven possible to manage the stock decline to not pass the  $B_{25\%}$  level and facilitate stock recovery within just a few years. There is no biological reason to expect the same control rules to function any less effectively with the 6 stocks considered in the present report. Thus, evidence shows the strategy has met its objectives even though it has not been tested, meeting SG60 and SG80, but not SG100.

Harvest strategy monitoring				
<b>c</b>	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	<b>All stocks: Y</b>		
Rationale				

Full at-sea monitoring of the offshore trawl fleet is conducted by the observer program and dockside monitoring exists for all gears. Hence the catch documentation is considered very reliable. Multispecies research trawl surveys are conducted both in BSAI and GOA and the status of 6 stocks is routinely monitored on all surveys. The annual data on catches and from surveys are combined in the assessment to provide annual time series of stock status. The trajectory of stock status and exploitation rate, measures by  $B$  (age 1+, age 2+, age 3+ and female spawning), harvest rate and  $F$  provide sufficient feedback to evaluate whether the harvest strategy is working. This meets the SG60.

Harvest strategy review				
<b>d</b>	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			<b>All stocks: Y</b>
Rationale				

The harvest strategy is entrenched in amendments to federal legislation and could only be changed in any significant ways in response to a change in legislation. However, NMFS reports annually to congress on performance of the management system relative to the legislation and makes the report available on-line. In preparing these reports, for each stock there is an annual evaluation in both on year and off-year assessments of whether the harvest strategy is allowing the stock to be overfished ( $F$  above  $F_{OFL}$ ), or is at risk of overfishing in the near future, or if the SSB is in the state of being overfished ( $B < B_{35\%}$ ) in the present or near future is conducted annually. The legislation also must be reauthorized at least once a decade. As part of the reauthorization process, the performance of the existing legislation, including the harvest strategy for the various tiers of assessment, is examined thoroughly. The last such review led to the legislative requirement that TACs cannot be set above the scientifically advised ABC for any stock, and the ABC must be lower than the OFL associated with  $F_{MSY}$  and  $B_{MSY}$ , and lower by a factor that takes account of the uncertainties in the assessment. Thus, there are both annual audits of performance and periodic reviews of the harvest strategy, and there is evidence that the reviews do lead to changes designed to improve the effectiveness of the harvest strategy. Therefore, SG100 is met.

Shark finning				
<b>e</b>	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Rationale				

Sharks are not a target species.

<b>f</b>	Review of alternative measures
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	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	<b>All stocks: N</b>

#### Rationale

The 2018 FMPs for groundfish in BSAI and GOA management areas (<https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>, <https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmfp.pdf>) established adaptive management measures with regular and periodic review taking into consideration as objective to continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards. Therefore, SG60 and SG80 are met. However, the review on the measures to reduce the unwanted catches are not reviewed every 2 years. Therefore, SG100 is not met.

#### References

2018 SAFE report for BSAI Atka mackerel: Lowe S, Ianelli JN, Palsson W; 2016 SAFE report for BSAI Pacific Ocean perch: Spencer PD, Ianelli JN; 2017 SAFE report for GOA Pacific Ocean perch; 2014 SAFE report for BSAI northern rockfish:

SAFE report for GOA northern rockfish: Hulson P-JF, Cunningham, CJ, Hanselman DH, Lunsford, CR (2018b); 2017 SAFE report for GOA dusky rockfish: Lunsford CR, Fenske, KH, Shotwell SK, Hanselman DH

2018 FMP for groundfish in BSAI management area. 174 pp. (<https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>).

2018 FMP for groundfish in GOA management area. 150 pp. (<https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmfp.pdf>).

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>All stocks: More information sought to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All stocks: 85</b>
Condition number (if relevant)	

## PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	HCRs design and application			
	Guide post	<b>Generally understood</b> HCRs are in place <b>or available</b> that are <b>expected</b> to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	<b>Well defined</b> HCRs are <b>in place</b> that <b>ensure</b> that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock <b>fluctuating around</b> a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock <b>fluctuating at or above</b> a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, <b>most</b> of the time.
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	<b>All stocks: N</b>
Rationale				

The HCR for all Tier 3 stocks is clearly defined in NMFS 2001 and the annual FMPs (both in BSAI and GOA). When SSB is at or above  $B_{35\%}$ , the ABC is set at the harvest consistent with  $F_{40\%}$ . When the female SSB falls below  $B_{35\%}$ , then the  $F$  used to calculate the ABC is reduced below  $F_{40\%}$ , in direct proportion to the discrepancy between  $B_{35\%}$  and the current estimate of biomass. The Council may set the annual quota below the advised ABC in the year's SAFE report but cannot exceed it. By triggering reduction in  $F$  well before  $B_{25\%}$  is reached. Therefore, SG60 and SG80 are met. The SAFE reports do not define  $B_{MSY}$  and  $B_{35\%}$ ; instead  $B_{40\%}$  is used as a trigger point. Therefore, SG100 is not met.

HCRs robustness to uncertainty				
<b>b</b>	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a <b>wide</b> range of uncertainties including the ecological role of the stock, and there is <b>evidence</b> that the HCRs are robust to the main uncertainties.
	Met?		<b>All stocks: Y</b>	<b>All stocks: N</b>
Rationale				

The main features of the HCR for BSAI and GOA stocks are generic for NMFS Tier 3 stocks. The performance of the control rule hinges on the factors considered in the assessment, since the rule itself is simple and triggered by the results of the annual assessment process. If the assessment concludes that that stock is below the  $B_{35\%}$  reference point, the  $F$  used to calculate ABC is reduced proportionately, and exploitation automatically begins to be reduced. The assessment itself considers a wide range of uncertainties, including uncertainty in data inputs, and recruitment uncertainty and uncertainty in growth rate and natural mortality, the major components of stock productivity. Moreover, in both full and "off-year" assessments usually seven different projection scenarios are required to be explored, and additional projection scenarios can be requested by either the Plan Team or the Council. The projections evaluate the risk of overfishing occurring or the stock entering the condition of being overfished, for at least the next 5 years. Therefore, the HCR are robust to the main uncertainties and SG80 is met.

However, taking into account that the stock structure is still under investigation and the stocks can potentially be shared with other countries (e.g. Russia) it is not possible to conclude that the HCR take into account a wide range of uncertainties and SG100 is not met.

HCRs evaluation				
<b>C</b>	Guide post	There is <b>some evidence</b> that tools used <b>or available</b> to implement HCRs are appropriate and effective in controlling exploitation.	<b>Available evidence indicates</b> that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	<b>Evidence clearly shows</b> that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	<b>All stocks: Y</b>
Rationale				

The most important tool in use to implement the HCRs is the TAC. For the entire time that the 6 stocks have been managed separately under the current harvest strategy the biomass have been well above  $B_{40\%}$ , catches have been well below the corresponding ABC and declining annually, and the annual TAC has been set at or below the ABC. The analytical assessments provide direct estimates of exploitation rates, and these have always been well below the maximum exploitation rate consistent with application of the harvest strategy. The fishery management plans prescribe that TAC may equal but never exceed ABC, such that  $TAC < ABC < OFL$ . The sum of TACs for all groundfish stocks must also remain within the optimum yield (OY) range defined in the FMP. Catches of the 6 stocks have been always below of the TAC in the last period (with the only exception of BSAI Northern rockfish in 2015). Thus, there is clear evidence that exploitation rates consistent with or below the harvest strategy are being achieved and are expected to continue to be achieved in the future. Therefore, SG60, SG80, and 100 are met.

## References

2018 SAFE report for BSAI Atka mackerel: Lowe S, Ianelli JN, Palsson W; 2016 SAFE report for BSAI Pacific Ocean perch: Spencer PD, Ianelli JN; 2017 SAFE report for GOA Pacific Ocean perch; 2014 SAFE report for BSAI northern rockfish:

SAFE report for GOA northern rockfish: Hulson P-JF, Cunningham, CJ, Hanselman DH, Lunsford, CR (2018b); 2017 SAFE report for GOA dusky rockfish: Lunsford CR, Fenske, KH, Shotwell SK, Hanselman DH

2018 FMP for groundfish in BSAI management area. 174 pp. (<https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>).

2018 FMP for groundfish in GOA management area. 150 pp. (<https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmppdf.pdf>).

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>For all stocks, more thorough evaluation of stock assessment/harvest strategy scenarios may allow for higher scores.</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All stocks: 85</b>
Condition number (if relevant)	



## PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	<b>Some</b> relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	<b>Sufficient</b> relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A <b>comprehensive range</b> of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	<b>All stocks: Y</b>
Rationale				

The information used in the annual assessment includes data from catches by all fleet sectors. All the UoAs are fully monitored. Sampling of catches is undertaken by on-board observers and at-seas or dockside observers. Some observer sampling also provides annual length and aging structures from the commercial catches. The assessment uses a time series of commercial catches starting in the 1970s, depending on the particular model runs with occasional fittings for longer time series.

Full sampling of length composition of research catches, plus quantification of CPUE is available from the 80's, when the present survey gear was adopted. Survey catch rates prior to that date are often not used in the assessment, since the survey gear was found to affect the catchability of many flatfish. Levels of biological sampling of the surveys' catches are highly variable, depending on other demands on the scientific staff, but have been sufficient to allow quantification of the main life history parameters and gear selectivities in the assessment.

Extensive oceanographic data on the BSAI and GOA are also collected both during the multispecies surveys and targeted oceanographic sampling both in situ and remotely. Diet analyses of potential predators on 6 stocks plus of the diet of various sizes of the species have been undertaken as well. Thus, a comprehensive range of information is available on the stock, the fishery and the ecosystem, meeting SG60, SG80, and SG100.

Monitoring				
b	Guide post	Stock abundance and UoA removals are monitored and <b>at least one indicator</b> is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are <b>regularly monitored at a level of accuracy and coverage consistent with the harvest control rule</b> , and <b>one or more indicators</b> are available and monitored with sufficient frequency to support the harvest control rule.	<b>All information</b> required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent <b>uncertainties</b> in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	<b>All stocks: N</b>
Rationale				

Catch monitoring is done for the entire fishing season each year, and the surveys are regularly conducted both in BSAI and GOA. In addition to all the biological information and fishery dependent data on catches that are discussed



above, the size of all fleet components is generally known and updated annually. The spatial distribution of effort is known on very precise space and time scales for the federally managed fleet, which takes essentially all the catch. There is a good understanding of the uncertainties associated with the data sources, and the uncertainties are taken into account in the assessments which trigger the application of the HCRs. Thus, stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the HCR, with more indicators (e.g. biomass indexes and recruitment abundance) available and monitored with sufficient frequency to support the HCR, meeting SG60 and SG80. However, taking into account the uncertainty in stock structure of the 6 UoAs is not possible to conclude that there is a good understanding of inherent uncertainties in the information, and SG100 is not met.

Comprehensiveness of information			
<b>C</b>	Guide post		There is good information on all other fishery removals from the stock.
	Met?		<b>All stocks: Y</b>
Rationale			

Not only the directed fishery but all fleets operating in the BSAI and GOA are monitored by on-board observers, such that the 6 stocks caught by fisheries directed for other species nevertheless are included in the catch statistics. Moreover also the recreational and subsistence fisheries are monitored (see <http://www.adfg.alaska.gov/sf/sportfishingsurvey/> and <https://www.adfg.alaska.gov/index.cfm?adfg=subsistence.harvest>).

## References

2018 SAFE report for BSAI Atka mackerel: Lowe S, Ianelli JN, Palsson W; 2016 SAFE report for BSAI Pacific Ocean perch: Spencer PD, Ianelli JN; 2017 SAFE report for GOA Pacific Ocean perch; 2014 SAFE report for BSAI northern rockfish:  
SAFE report for GOA northern rockfish: Hulson P-JF, Cunningham, CJ, Hanselman DH, Lunsford, CR (2018b);  
2017 SAFE report for GOA dusky rockfish: Lunsford CR, Fenske, KH, Shotwell SK, Hanselman DH

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>60-79</b>
Information gap indicator	<b>More information to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All stocks: 90</b>
Condition number (if relevant)	

## PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		<b>All stocks: Y</b>	<b>All stocks: Y</b>
Rationale				

The stock assessment approaches used in the assessments of the 6 stocks are statistical catch at age methods and are considered appropriate given the available data and according to independent peer reviews by the Center for Independent Experts, which has found that the strengths of the assessments are:

- The simple stock hypotheses are appropriate given the lack of detailed information.
- Good ageing data are available for estimating growth parameters.
- There is a wealth of trawl survey data.
- There is a strong observer program.
- Assumed population dynamics are consistent with current knowledge.
- Estimation methods are adequate.
- Modelling of uncertainty is adequate.

The methodologies employed considers the relevant biological features of the stocks as age/length, growth, sexual maturity and weight at age/length. Therefore, SG80 and SG100 are met.

Assessment approach				
<b>b</b>	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	
Rationale				

The stock assessment annually updates the reference points used in managing the 6 stocks, as well as the point estimate and confidence interval of present stock status, to take account of the most recent catch data. The annual assessments produce both the stock status and reference point estimates in the same model framework, so the reference point and stock status values are always in scale with each other, meeting SG60 and SG80.

Uncertainty in the assessment				
<b>c</b>	Guide post	The assessment <b>identifies major sources</b> of uncertainty.	The assessment <b>takes uncertainty into account</b> .	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a <b>probabilistic</b> way.
	Met?	<b>All stocks: Y</b>	<b>All stocks: Y</b>	<b>All stocks: N</b>
Rationale				

The assessment methodologies employed have the ability to identify the major sources of uncertainty in almost any of the input data, and can estimate the uncertainty of almost any output, depending on the specifications set by the assessment team. Annual meetings with the Plan Team decide on which formulations are worth exploring in any given year, so not all possible sources of uncertainty are considered in every year. Therefore, SG60 is met.

In the most recent assessments major uncertainties addressed directly either as input distributions of parameters or as confidence intervals estimated for parameters output by the assessment included in most of the cases trawl fishery size composition, survey population size composition, survey age composition (for all years when aging of samples was conducted), trawl survey biomass estimates and S.E. Thus, the assessment does take into account uncertainty meeting SG80. However, the model outputs in the SAFE reports do not provide the risk in the advice (e.g. decision tables, risk-based reference points, etc.); therefore, SG100 is not met.

Evaluation of assessment			
<b>d</b>	Guide post		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?		<b>All stocks: N</b>
Rationale			

According to the information available from SAFE reports the performance of the assessment models for the 6 stocks have not been extensively tested with alternative approaches. Therefore, SG100 is not met.

Peer review of assessment				
<b>e</b>	Guide post		The assessment of stock status is subject to peer review.	The assessment has been <b>internally and externally</b> peer reviewed.
	Met?		<b>All stocks: Y</b>	<b>All stocks: Y</b>
Rationale				

The assessments receive peer review at three levels. The first is internal, in that the NMFS Plan Team meets with the assessment staff before, possibly during, and after the assessment is prepared. The first meeting is to scope the options and scenarios that should be explored in the annual assessment, based on the assessment of the previous year(s) and feedback about how the previous year's fishery has unfolded. Meetings between the assessment staff and the Plan Team occur in a somewhat ad hoc manner, depending on what issues may arise during preparation of the assessment. As the assessment nearly completion a meeting with the Plan Team is held to review results and presentation material, to be sure that the assessment is ready for presentation to the Council's Scientific and Statistical Committee (SSC). In a narrow sense only the final meeting of the Plan Team and assessment staff might be considered "peer review" of the assessment, but in fact just as "assessment" is both a process and a product, in a slightly broader sense all the meetings between the Plan Team and the assessment staff can be considered part of an internal peer review process, since all of the meetings have the coverage and quality of the assessment as their primary concern. Therefore, SG80 is met.

Once the assessment document is complete, each one receives a thorough and largely external review by the Council's SSC. All technical aspects of the assessment and the coverage of issues by alternative model formulations and scenarios are reviewed by the SSC. They can request reruns or deletion or addition of analyses, as they consider necessary to have a sound assessment as a basis for subsequent consultation and decision making. The make-up of the SSC includes both employees of NMFS and independent experts in ecological, economic and social sciences. However, none have a direct involvement in preparation of the assessment, and all participants are expected to act in their expert capacities rather than as institutional representatives. Therefore, SG100 is met.

## References

2018 SAFE report for BSAI Atka mackerel: Lowe S, Ianelli JN, Palsson W; 2016 SAFE report for BSAI Pacific Ocean perch: Spencer PD, Ianelli JN; 2017 SAFE report for GOA Pacific Ocean perch; 2014 SAFE report for BSAI northern rockfish:

SAFE report for GOA northern rockfish: Hulson P-JF, Cunningham, CJ, Hanselman DH, Lunsford, CR (2018b); 2017 SAFE report for GOA dusky rockfish: Lunsford CR, Fenske, KH, Shotwell SK, Hanselman DH

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>60-79</b>
Information gap indicator	<b>More information sought to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All stocks: 85</b>
Condition number (if relevant)	

## 5.3 Principle 2

### 5.3.1 BSAI ecosystem

The BS is a large semi-enclosed, high-latitude body of water comprising 44% continental shelf, 13% continental slope, and 43% deep-water basin. The EBS is one of the most biologically productive areas of the world, supporting approximately 300 species of fish, 150 species of crustaceans and mollusks, 70 species of seabirds, and 29 species of marine mammals in an area covering 785,000 km<sup>2</sup> (NPFMC 2018a).

The dominant circulation begins with the passage of North Pacific water (the Alaska Stream) into the EBS through the major passes in the AI. There is a net water transport eastward along the north side of the AI and a northward flow at the continental shelf break and at the eastern perimeter of Bristol Bay. Eventually EBS water exits northward through the Bering Strait or westward and south along the Russian coast, entering the western North Pacific via the Kamchatka Strait. There is a permanent cyclonic gyre around the deep basin in the central BS. Three oceanographic fronts – the outer shelf, mid-shelf, and inner shelf – follow along the 200, 100, and 50 m bathymetric contours, respectively, resulting in four oceanographic domains along the broad EBS shelf. The inner shelf is one well-mixed layer most of the time as temperature, salinity, and density remain constant with depth in the near-surface mixed-layer, which varies from approximately 10-30 m in summer to approximately 30-60 m in winter. On the middle shelf, a two-layer temperature and salinity structure exist because of downward mixing of wind and upward mixing due to relatively strong tidal currents. On the outer shelf, a three-layer temperature and salinity structure exist due to downward mixing by wind, horizontal mixing with oceanic water, and upward mixing from the bottom friction due to relatively strong tidal currents. The vertical physical system also regulates the biological processes that lead to separate cycles of nutrient regeneration.

An unusual physical characteristic of the BS shelf is the annual ice cover. In summer, the ice edge retreats into the Chukchi and Beaufort Seas whereas, in winter, typically much of the shelf is covered. The sea ice affects exchanges with the atmosphere and inhibits the transfer of freshwater and heat. The creation and melting of the sea ice alter the horizontal and vertical density gradients influencing the mixing and transport of nutrients and organisms within the euphotic zone. The ice edge also serves as both source and sink of freshwater that can affect productivity. Sea ice is also important in influencing bottom temperatures. Thus, the extent of sea ice is related to the distribution and abundance of temperature-sensitive bottom-dwelling species. In recent years, there has been an extreme decrease in sea ice, which has likely had an effect on several species' survivability and reproductive success (Siddon and Zador 2018).

The Aleutian North Slope Current in the BS and the Alaska Coastal Current and Alaskan Stream in the North Pacific are the three primary currents in the AI. Both bottom and pelagic habitats are subject to strong currents and tidal movements. The patterns of water density, salinity, and temperature in the AI are very similar to the GOA. Along the edge of the shelf in low salinity, the Alaskan Stream protrudes westward. On the south side of the central AI, nearshore surface salinities are higher as the higher salinity EBS surface water occasionally mixes southward through the AI. The narrow shelf west of Samalga Pass allows the Alaskan Stream to approach the islands and is the primary influence for the oceanic marine environment of these areas. East and west of Samalga Pass, the community structure, diet, and distribution of demersal fish, corals, seabirds, and marine mammals differ. For example, Samalga Pass has a major influence on the population structure of Steller sea lions (Fritz et al. 2013), and west of Samalga Pass, cold-water corals and sponge communities are a dominant feature of benthic communities on the steep rocky slopes of the AI (Heifetz et al. 2005).

### 5.3.2 GOA ecosystem

The GOA is a relatively open marine system with land masses to the east and the north and a continental shelf area (160,000 km<sup>2</sup>), which is less than 25% of that in the EBS. Commercially harvested species are more diverse in the GOA than in the EBS. The dominant circulation in the GOA is characterized by the cyclonic flow of the Alaska gyre, consisting of the eastward-flowing Subarctic Current system at approximately 50° N and the Alaska Coastal Current (Alaskan Stream) system along the northern GOA. Large seasonal variations in the wind stress affect the location of the Alaskan Stream and nearshore eddies. The variations in these nearshore flows and eddies affect much of the region's biological variability (NPFMC 2018b).

### 5.3.3 Primary and secondary species

Observer data of non-target species are summarized below split across area and UoAs. These tables include a wide range of fish, seabird, and benthic species. MSC (2014) defines primary species as a species that is caught but is not the target species, that is within scope of the MSC program (i.e., not an amphibian, reptile, bird, or marine mammal), and that has management tools and measures in place. MSC (2014) defines secondary species as a species that is

caught but is not the target species and is not considered primary or is out of scope but not an endangered, threatened, and protected (ETP) species.<sup>13</sup> MSC (2014) states that a “main species” is one where the catch of that species by the UoA is 5% or more by weight of the total catch of all species by the UoA or where that species is classified as less resilient and its catch is 2% or more by weight of the total catch of all species by the UoA. Further, “less resilient” is when the productivity of the species indicates that it is intrinsically of low resilience (which can be determined by the productivity part of the Productivity Susceptibility Analysis) or when its resilience has been lowered by anthropogenic or natural changes to its life history. Non-ETP out-of-scope species are always considered main secondary.

#### 7.3.3.1 UoA 1 – BSAI Atka mackerel

Based on the definitions above and the data provided in Table 12, this UoA has no main primary species and four main secondary species or species groups (see more on species groups in Section 7.3.3.4) – auklets, northern fulmar (*Fulmarus glacialis*), shearwaters (Family *Procellariidae*), and fork-tailed storm petrel<sup>14</sup> (see pink rows). Leach’s storm petrel is ETP (see lavender row) and will be discussed in more detail below. The species highlighted in blue are those with prohibited species catch (PSC) limits. The Council and NMFS have adopted measures to limit the catch of certain species that are taken incidentally in the groundfish fisheries, which include these UoAs. While not ETP species under the MSC definition, they have been designated as “prohibited species” in FMPs since they are target species in other, fully utilized fisheries. Therefore, they are considered ETP in this assessment. Lastly, the main habitats (in these cases, the vulnerable marine ecosystems [VMEs]) are highlighted in yellow and will be discussed in more detail in Section 7.3.5.

<sup>13</sup> An ETP species is one that is recognized by national ETP legislation; a species listed in a binding international agreement (refer to MSC 2014 for the list of relevant binding international agreements); or an out-of-scope species that is listed in the IUCN Red List as vulnerable, endangered, or critically endangered.

<sup>14</sup> Two species of storm petrel are likely part of the species grouping. One is main secondary, and one is ETP. For simplicity, the row in Table 7 has been labeled as “ETP. See Sections 7.3.3.4 and 7.3.4.3 for more details.

**Table 14. Catch totals of non-target species for 2014-2018 by the BSAI Atka mackerel UoA (in green). Catch totals of non-target species for 2014-2018 by the BSAI Atka mackerel UoA (in green). (The BSAI Pacific Ocean perch and northern rockfish UoAs are also considered “target” since they are all caught by the same vessels during the same trips.) Sources: catch and observer data and Krieger et al. 2019**

Species	Primary, Secondary, ETP, or Habitat	Main?	Year					Five-Year Average	% of Total Average Catch
			2014	2015	2016	2017	2018		
Atka mackerel	Target (P1)	NA	28,165.99	47,533.44	48,366.58	58,698.79	64,070.14	49,366.99	72.57%
Northern rockfish	Target (P1)	NA	1,295.86	4,118.08	2,940.77	3,070.51	3,865.49	3,058.14	4.50%
Pacific Ocean perch	Target (P1)	NA	4,262.79	5,111.84	7,762.92	6,945.42	9,139.55	6,644.51	9.77%
Alaska skate	Primary	No	59.49	97.05	109.61	150.67	131.92	109.75	0.16%
Aleutian skate	Primary	No	19.10	17.37	28.51	50.46	51.80	33.45	0.05%
Arrowtooth flounder	Primary	No	1,042.68	110.22	223.06	131.53	353.06	372.11	0.55%
Auklets*	Secondary	Yes	0	0	0	0	54	10.80	NA
Bairdi tanner crab*	ETP	Yes	0.00	253.61	0.00	44.00	0.00	59.52	NA
Benthic urochordata	Secondary	No	0.13	0.42	0.20	0.57	3.17	0.90	0.00%
Bigmouth sculpin	Primary	No	23.34	48.06	58.25	78.21	68.95	55.36	0.08%
Bivalves	NA	No	0.06	0.14	0.11	0.11	0.06	0.10	0.00%
Blue king crab*	ETP	Yes	0.00	0.00	0.00	0.00	0.00	0.00	NA
Brittle star, unidentified	NA	No	0.06	0.25	0.05	0.06	0.14	0.11	0.00%
Chinook*	ETP	Yes	299.00	136.00	535.00	1,109.00	650.39	545.88	NA
Corals bryozoans, unidentified	NA	No	8.24	14.54	6.88	9.61	15.52	10.96	0.02%
Dover sole	Primary	No	1.04	0.20	0.00	0.47	0.82	0.50	0.00%
Dusky rockfish	Primary	No	257.77	217.70	267.23	335.11	497.82	315.13	0.46%
Eelpouts	Secondary	No	1.55	0.48	0.59	0.17	2.18	0.99	0.00%
Flathead sole	Primary	No	0.00	4.55	8.00	4.74	4.39	4.34	0.01%
Golden king crab*	ETP	Yes	2,571.00	1,321.00	2,898.00	1,409.00	7,073.74	3,054.55	NA
Great sculpin	Primary	No	0.00	6.25	0.00	0.75	1.17	1.63	0.00%
Greenlings	Primary	No	0.00	0.00	0.00	0.08	0.40	0.10	0.00%
Harlequin rockfish	Primary	No	7.99	13.61	21.72	35.07	75.39	30.75	0.05%
Hermit crab, unidentified	NA	No	0.04	0.12	0.04	0.03	0.03	0.05	0.00%
Invertebrate, unidentified	NA	No	0.33	0.00	6.91	0.09	0.69	1.60	0.00%

Kamchatka flounder	Primary	No	625.70	279.64	399.68	388.97	441.74	427.14	0.63%
Misc. crabs	NA	No	0.16	2.60	0.16	0.24	0.39	0.71	0.00%
Misc. crustaceans	NA	No	0.02	0.09	0.23	0.12	0.27	0.14	0.00%
Misc. deep fish	NA	No	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Misc. fish	NA	No	58.44	117.67	123.06	185.86	179.90	132.99	0.20%
Misc. invertebrates (worms, etc.)	NA	No	0.01	0.00	0.00	0.00	0.00	0.00	0.00%
Non-chinook*	ETP	Yes	514.00	1,686.61	1,162.00	1,611.00	1,476.44	1,290.01	NA
Northern fulmar*	Secondary	Yes	0	92	0	0	221	62.60	NA
Octopus	Primary	No	0.01	0.52	1.16	0.45	0.98	0.62	0.00%
Opilio tanner crab*	ETP	Yes	0.00	37.98	0.00	0.00	0.00	7.60	NA
Pacific cod	Primary	No	907.91	2,276.51	2,511.54	3,939.74	3,361.28	2,599.40	3.82%
Pacific halibut	ETP	Yes	107.32	125.68	112.00	99.27	110.97	111.05	0.16%
Pacific herring	ETP	Yes	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Pacific sleeper shark	Primary	No	0.00	0.00	0.00	0.00	2.07	0.41	0.00%
Pandalid shrimp	Primary	No	0.31	0.11	0.22	0.22	0.22	0.22	0.00%
Pollock	Primary	No	633.18	165.23	451.08	506.07	910.19	533.15	0.78%
Polychaete, unidentified	NA	No	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Red king crab*	ETP	Yes	795.00	4,956.00	348.00	239.00	239.00	1,315.40	NA
Red tree coral	Habitat	Yes	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Redbanded rockfish	Primary	No	0.00	0.00	0.00	0.00	0.32	0.06	0.00%
Rex sole	Primary	No	2.24	10.56	7.81	10.35	10.32	8.26	0.01%
Rock sole	Primary	No	32.67	52.38	57.09	72.43	104.64	63.84	0.09%
Rockfish (state managed)	Primary	No	0.00	1.05	1.23	2.17	1.56	1.20	0.00%
Rougheye rockfish	Primary	No	34.93	33.02	34.80	38.37	79.36	44.10	0.06%
Sablefish	Primary	No	4.60	3.34	13.45	56.34	101.30	35.81	0.05%
Salmon shark	Primary	No	0.62	0.00	0.72	1.39	0.94	0.74	0.00%
Sculpin	NA	No	37.12	40.70	80.86	72.30	83.48	62.89	0.09%
Sculpin, unidentified	NA	No	1.83	4.28	10.22	0.77	2.31	3.88	0.01%
Scypho jellies	Secondary	No	0.49	0.59	1.28	0.42	1.16	0.79	0.00%
Sea anemone, unidentified	NA	No	0.74	1.49	1.44	2.02	1.60	1.46	0.00%



Sea pens, whips	Habitat	Yes	0.00	0.01	0.02	0.00	0.00	0.01	0.00%
Sea star	Secondary	No	5.00	12.27	8.43	16.15	17.44	11.86	0.02%
Shearwaters*	Secondary	Yes	0	0	184	156	139	95.80	NA
Shortraker rockfish	Primary	No	14.77	8.79	12.51	14.29	25.35	15.14	0.02%
Skate	NA	No	19.66	16.48	26.85	17.42	21.31	20.34	0.03%
Snails	NA	No	0.61	0.70	0.34	0.47	0.84	0.59	0.00%
Sponge, unidentified	NA	No	55.68	116.75	75.59	150.25	161.30	111.91	0.16%
Squid	Primary	No	30.84	12.98	16.30	12.44	5.97	15.71	0.02%
Storm petrels*	ETP <sup>#</sup>	Yes	0	0	0	0	197	39.40	NA
Thornyhead rockfish	Primary	No	17.99	7.96	22.95	14.63	23.13	17.33	0.03%
Turbot	Primary	No	44.51	24.58	45.89	44.87	28.20	37.61	0.06%
Urchins, dollars, cucumbers	Secondary	No	1.69	1.49	1.96	2.08	3.89	2.22	0.00%
White blotched skate	Primary	No	391.34	363.81	495.68	499.84	657.75	481.69	0.71%
Yellow Irish lord	Secondary	No	111.73	280.24	153.36	325.25	229.67	220.05	0.32%
Yellowfin sole	Primary	No	0.00	0.00	0.12	0.58	0.30	0.20	0.00%
Total Catch**			39,584.46	65,373.90	67,410.24	79,058.70	88,718.32	68,029.12	

Notes:

“NA” is used in place of Primary, Secondary, ETP, or Habitat when the species caught was non-specific or unidentifiable.

\* Number of individuals instead of metric tons.

\*\* Does not include species with individual numbers instead of weight.

<sup>#</sup> Two species of storm petrel are likely part of this species grouping. One is main secondary, and one is ETP. For simplicity, this row has been labeled as “ETP”. See Sections 7.3.3.4 and 7.3.4.3 for more details.

#### **7.3.3.2 UoAs 2 and 3 – BSAI Pacific Ocean perch and northern rockfish**

Based on the definitions above and the data provided in Table 13, these UoAs have no main primary species and three main secondary species or species groups (see more on species groups in Section 7.3.3.4) – auklets, northern fulmar, and shearwaters (see pink rows). Laysan albatross are ETP (see lavender row) and will be discussed in more detail below. As above, the species highlighted in blue are those with PSC limits, which are considered ETP for this assessment, and the main habitats are highlighted in yellow.

#### **7.3.3.3 UoAs 4, 5, and 6 – GOA northern rockfish, Pacific Ocean perch, and dusky rockfish**

Based on the definitions above and the data provided in Table 14, these UoAs have no main primary species and one main secondary species – northern fulmar (see pink row). As above, the species highlighted in blue are those with PSC limits, which are considered ETP for this assessment, and the main habitats are highlighted in yellow.

**Table 15. Catch totals of non-target species for 2014-2018 by the BSAI Pacific Ocean perch and northern rockfish UoAs (in green). (The data for these UoAs are combined since the database only has an aggregated catch for when rockfish are targeted. The BSAI Atka mackerel UoA is also considered “target” since all target species are caught by the same vessels during the same trips.) Sources: catch and observer data and Krieger et al. 2019**

Species	Primary, Secondary, ETP, or Habitat	Main?	Year					Five-Year Average	% of Total Average Catch
			2014	2015	2016	2017	2018		
Northern rockfish	Target (P1)	NA	863.69	2,863.21	1,338.17	1,475.92	1,767.72	1,661.74	5.13%
Pacific Ocean perch	Target (P1)	NA	26,069.11	23,419.89	19,588.59	20,422.26	21,091.19	22,118.21	68.22%
Atka mackerel	Target (P1)	NA	2,174.82	5,490.40	5,255.28	5,365.33	5,512.63	4,759.69	14.68%
Alaska plaice	Primary	No	0.00	0.00	0.00	0.00	0.66	0.13	0.00%
Alaska skate	Primary	No	33.42	34.31	34.93	63.43	43.80	41.98	0.13%
Aleutian skate	Primary	No	26.40	46.56	29.67	22.20	26.04	30.17	0.09%
Arrowtooth flounder	Primary	No	697.10	629.69	362.66	358.70	256.98	461.02	1.42%
Auklets*	Secondary	Yes	0	0	0	0	49	9.80	NA
Bairdi tanner crab*	ETP	Yes	102.00	51.00	70.00	100.00	844.03	233.41	NA
Benthic urochordata	Secondary	No	2.82	1.50	0.18	0.32	0.68	1.10	0.00%
Bigmouth sculpin	Primary	No	17.30	19.51	11.21	52.29	28.28	25.72	0.08%
Bivalves	NA	No	0.03	0.14	0.05	0.02	0.04	0.06	0.00%
Blue king crab*	ETP	Yes	0.00	0.00	0.00	0.00	0.00	0.00	NA
Brittle star, unidentified	NA	No	0.17	1.61	0.12	0.14	5.80	1.57	0.00%
Chinook*	ETP	Yes	257.00	778.00	211.00	577.00	275.00	419.60	NA
Corals bryozoans, unidentified	NA	No	32.62	46.45	11.15	26.61	5.89	24.54	0.08%
Dover sole	Primary	No	1.60	0.00	0.45	1.27	1.33	0.93	0.00%
Dusky rockfish	Primary	No	78.14	73.24	58.38	71.33	80.15	72.25	0.22%
Eelpouts	Secondary	No	2.84	1.76	1.33	4.56	2.39	2.58	0.01%
Flathead sole	Primary	No	38.74	51.95	40.90	52.92	67.00	50.30	0.16%
Golden king crab*	ETP	Yes	7,667.00	5,591.00	5,289.06	3,016.00	4,950.55	5,302.72	NA
Great sculpin	Primary	No	0.95	1.54	0.00	0.94	10.00	2.69	0.01%
Greenlings	Secondary	No	0.00	0.00	0.00	0.00	0.17	0.03	0.00%
Harlequin rockfish	Primary	No	11.27	20.66	14.09	13.08	20.07	15.84	0.05%
Hermit crab, unidentified	NA	No	0.03	0.09	0.02	0.01	0.04	0.04	0.00%

Invertebrate, unidentified	NA	No	0.33	0.00	1.86	0.13	0.13	0.49	0.00%
Kamchatka flounder	Primary	No	641.51	565.17	461.73	427.48	322.40	483.66	1.49%
Laysan albatross*	ETP	Yes	0	0	0	0	93	18.60	NA
Misc. crabs	NA	No	0.30	0.24	0.40	0.24	0.29	0.29	0.00%
Misc. crustaceans	NA	No	0.23	0.20	0.11	0.38	0.23	0.23	0.00%
Misc. deep fish	NA	No	0.01	0.00	0.00	0.00	0.01	0.00	0.00%
Misc. fish	NA	No	43.00	61.46	58.93	107.35	76.02	69.35	0.21%
Misc. invertebrates (worms, etc.)	NA	No	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Non-chinook*	ETP	Yes	330.00	268.00	185.00	124.00	764.00	334.20	NA
Northern fulmar*	Secondary	Yes	0	38	0	0	0	7.60	NA
Octopus	Primary	No	3.23	0.52	0.81	3.01	2.77	2.07	0.01%
Opilio tanner crab*	ETP	Yes	0.00	0.00	17.00	73.00	14,541.06	2,926.21	NA
Pacific cod	Primary	No	361.03	730.65	625.01	812.67	637.22	633.32	1.95%
Pacific halibut	ETP	Yes	88.34	76.95	22.61	34.48	20.89	48.65	0.15%
Pacific herring	ETP	Yes	0.00	0.00	0.00	0.01	0.04	0.01	0.00%
Pacific sleeper shark	Primary	No	0.00	1.68	0.00	0.00	2.10	0.76	0.00%
Pandalid shrimp	Primary	No	0.26	0.40	0.15	0.10	0.35	0.25	0.00%
Pollock	Primary	No	1,103.62	947.22	874.91	1,423.77	1,523.92	1,174.69	3.62%
Polychaete, unidentified	NA	No	0.00	0.00	0.00	0.00	0.02	0.00	0.00%
Red king crab*	ETP	Yes	127.00	99.00	58.09	631.00	477.03	278.42	NA
Red tree coral	Habitat	Yes	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Redbanded rockfish	Primary	No	0.42	0.00	0.11	0.41	0.28	0.24	0.00%
Rex sole	Primary	No	64.68	40.52	15.70	50.77	86.61	51.66	0.16%
Rock sole	Primary	No	21.43	37.95	14.71	32.18	35.92	28.44	0.09%
Rockfish (state managed)	Primary	No	0.00	0.49	0.62	0.00	0.35	0.29	0.00%
Rockfish, unidentified	NA	No	0.00	0.00	0.00	0.00	0.07	0.01	0.00%
Rougheye rockfish	Primary	No	113.13	91.91	69.98	64.92	115.58	91.10	0.28%
Sablefish	Primary	No	20.06	10.68	14.32	142.78	147.39	67.05	0.21%
Salmon shark	Primary	No	0.00	0.00	0.00	0.00	0.32	0.06	0.00%

Sculpin	NA	No	67.03	78.28	42.95	56.27	47.51	58.41	0.18%
Sculpin, unidentified	NA	No	0.74	0.69	14.81	0.29	0.70	3.45	0.01%
Scypho jellies	Secondary	No	0.46	0.73	0.52	0.39	0.70	0.56	0.00%
Sea anemone, unidentified	NA	No	0.22	0.29	0.19	0.25	0.33	0.26	0.00%
Sea pens, whips	Habitat	Yes	0.14	0.07	0.06	0.00	0.50	0.15	0.00%
Sea star	Secondary	No	5.90	9.12	3.29	4.27	38.68	12.25	0.04%
Shearwaters*	Secondary	Yes	0	0	0	772	0	154.40	NA
Shortraker rockfish	Primary	No	53.64	62.70	37.27	36.47	115.61	61.14	0.19%
Skate	NA	No	14.74	18.52	12.36	15.44	23.96	17.00	0.05%
Snails	NA	No	0.42	0.51	0.13	0.31	0.67	0.41	0.00%
Sponge, unidentified	NA	No	127.82	149.36	48.31	71.48	76.78	94.75	0.29%
Squid	Primary	No	55.61	66.19	25.73	30.62	49.60	45.55	0.14%
Thornyhead rockfish	Primary	No	72.28	75.89	56.61	78.24	96.39	75.88	0.23%
Turbot	Primary	No	41.52	34.23	27.84	37.20	53.17	38.79	0.12%
Urchins, dollars, cucumbers	Secondary	No	0.93	1.55	0.37	1.14	1.90	1.18	0.00%
White blotched skate	Primary	No	88.90	71.86	62.30	43.13	71.08	67.45	0.21%
Yellow Irish lord	Secondary	No	10.12	27.00	18.36	25.44	18.91	19.96	0.06%
Yellowfin sole	Primary	No	0.41	0.67	0.87	0.19	3.86	1.20	0.00%
Total Catch**			33,053.52	35,866.20	29,261.13	31,433.13	32,494.13	32,421.62	

Notes:

"NA" is used in place of Primary, Secondary, ETP, or Habitat when the species caught was non-specific or unidentifiable.

\* Number of individuals instead of metric tons

\*\* Does not include species with individual numbers instead of weight

**Table 16. Catch totals of non-target species for 2014-2018 by the GOA northern rockfish, Pacific Ocean perch, and dusky rockfish UoAs (in green). (The data for these UoAs are combined since the database only has an aggregated catch for when rockfish are targeted.) Sources: catch and observer data and Krieger et al. 2019**

Species	Primary, Secondary, ETP, or Habitat	Main?	Year					Five-Year Average	% of Total Average Catch
			2014	2015	2016	2017	2018		
Northern rockfish	Target (P1)	NA	3,650.07	3,631.90	3,155.04	1,602.23	2,151.83	2,838.21	9.19%
Pacific Ocean perch	Target (P1)	NA	15,283.44	17,565.66	20,402.18	19,077.09	22,164.86	18,898.65	61.18%

Dusky rockfish	Target (P1)	NA	2,752.47	2,492.14	3,004.20	2,191.91	2,690.57	2,626.26	8.50%
Alaska plaice	Primary	No	0.00	0.00	0.00	0.19	0.00	0.04	0.00%
Alaska skate	Primary	No	6.13	0.00	1.24	2.07	0.61	2.01	0.01%
Aleutian skate	Primary	No	34.44	17.58	13.61	12.93	15.38	18.79	0.06%
Arrowtooth flounder	Primary	No	1,425.51	1,397.46	1,199.77	1,405.14	737.91	1,233.16	3.99%
Atka mackerel	Primary	No	446.20	987.91	594.88	542.66	1,138.33	742.00	2.40%
Bairdi tanner crab*	ETP	Yes	191.21	49.00	5.02	757.15	201.90	240.86	NA
Benthic urochordata	Secondary	No	0.23	0.28	0.50	0.20	0.07	0.25	0.00%
Big skate	Primary	No	3.88	6.68	4.58	5.59	3.24	4.79	0.02%
Bigmouth sculpin	Primary	No	18.57	19.15	29.33	25.06	34.08	25.24	0.08%
Bivalves	NA	No	0.01	0.00	0.00	0.01	0.00	0.00	0.00%
Blue king crab*	ETP	Yes	0.00	0.00	0.00	0.00	0.00	0.00	NA
Bocaccio rockfish	Primary	No	0.00	0.00	0.08	0.00	0.08	0.03	0.00%
Brittle star, unidentified	Secondary	No	0.05	0.06	0.03	0.60	0.01	0.15	0.00%
Butter sole	Primary	No	0.00	0.35	0.00	0.00	0.72	0.21	0.00%
Canary rockfish	Primary	No	0.32	0.23	0.64	0.25	2.03	0.69	0.00%
China rockfish	Primary	No	0.03	0.05	0.25	0.13	0.11	0.11	0.00%
Chinook*	ETP	Yes	1,247.91	1,914.93	383.45	519.88	325.36	878.31	NA
Copper rockfish	Primary	No	0.04	0.01	0.12	0.03	0.04	0.05	0.00%
Corals bryozoans, unidentified	NA	No	1.92	0.70	0.85	0.47	1.57	1.10	0.00%
Dark blotched rockfish	Primary	No	4.19	0.00	0.00	0.00	0.00	0.84	0.00%
Dover sole	Primary	No	67.66	43.51	62.65	56.04	40.92	54.16	0.18%
Eelpouts	Secondary	No	0.13	0.01	0.02	0.13	0.22	0.10	0.00%
English sole	Primary	No	0.36	0.00	0.25	0.00	1.57	0.44	0.00%
Flatfish, unidentified	NA	No	0.00	0.00	0.00	0.02	0.00	0.00	0.00%
Flathead sole	Primary	No	30.31	45.67	26.45	80.57	43.83	45.36	0.15%
Golden king crab*	ETP	Yes	33.82	19.00	19.79	209.00	323.92	121.11	NA
Great sculpin	Primary	No	1.51	0.25	0.02	0.73	0.00	0.50	0.00%
Greenlings	Secondary	No	4.16	8.14	5.80	3.90	4.48	5.29	0.02%

Harlequin rockfish	Primary	No	437.13	565.13	584.33	442.82	550.35	515.95	1.67%
Hermit crab, unidentified	NA	No	0.04	0.03	0.01	0.03	0.01	0.03	0.00%
Invertebrate, unidentified	NA	No	0.00	0.19	0.09	0.07	0.64	0.20	0.00%
Kamchatka flounder	Primary	No	0.78	0.61	1.68	1.62	23.70	5.68	0.02%
Longnose skate	Primary	No	26.05	33.43	46.07	41.74	44.17	38.29	0.12%
Misc. crabs	NA	No	0.08	0.16	0.35	1.14	0.72	0.49	0.00%
Misc. crustaceans	NA	No	0.00	0.00	0.03	0.01	0.13	0.03	0.00%
Misc. fish	NA	No	132.90	144.18	101.97	114.76	161.50	131.06	0.42%
Misc. flounder	NA	No	0.06	0.08	0.41	0.30	0.33	0.23	0.00%
Non-chinook*	ETP	Yes	555.46	337.13	217.28	641.03	314.53	413.09	NA
Northern fulmar*	Secondary	Yes	20	0	0	44	50	22.80	NA
Octopus	Primary	No	6.69	11.36	1.81	1.30	2.84	4.80	0.02%
Opilio tanner crab*	ETP	Yes	0.00	0.00	0.02	0.01	0.00	0.00	NA
Osmerids, other	NA	No	0.00	0.00	0.03	0.00	0.00	0.01	0.00%
Pacific cod	Primary	No	624.24	783.02	363.08	253.13	391.75	483.04	1.56%
Pacific hake	Primary	No	0.00	0.00	0.04	0.00	0.06	0.02	0.00%
Pacific halibut	ETP	Yes	129.95	157.33	124.91	126.74	79.19	123.62	0.40%
Pacific herring	ETP	Yes	0.00	0.00	0.00	0.04	0.01	0.01	0.00%
Pacific sleeper shark	Primary	No	0.00	1.57	7.64	9.58	3.19	4.40	0.01%
Pandalid shrimp	Primary	No	0.10	0.05	0.22	0.14	0.07	0.12	0.00%
Plain sculpin	Primary	No	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Pollock	Primary	No	1,338.95	1,330.12	572.06	1,056.73	905.52	1,040.67	3.37%
Polychaete, unidentified	NA	No	0.00	0.00	0.00	0.02	0.00	0.00	0.00%
Pygmy rockfish	Primary	No	0.00	0.00	0.03	0.00	0.00	0.01	0.00%
Quillback rockfish	Primary	No	0.38	0.60	0.71	0.34	1.17	0.64	0.00%
Red king crab*	ETP	Yes	0.00	0.00	0.14	0.00	0.05	0.04	NA
Red tree coral	Habitat	Yes	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Redbanded rockfish	Primary	No	31.07	24.19	30.58	26.12	31.19	28.63	0.09%
Redstripe rockfish	Primary	No	70.29	41.51	109.07	56.59	159.61	87.41	0.28%

Rex sole	Primary	No	84.07	115.97	140.15	112.02	133.38	117.12	0.38%
Rock sole	Primary	No	27.78	26.67	11.31	9.67	16.80	18.45	0.06%
Rockfish (state managed)	Primary	No	50.47	47.55	13.36	24.48	50.24	37.22	0.12%
Rosethorn rockfish	Primary	No	0.38	0.39	0.85	4.40	0.44	1.29	0.00%
Rougheye rockfish	Primary	No	358.95	224.64	350.66	269.39	316.71	304.07	0.98%
Sablefish	Primary	No	527.25	433.88	480.64	585.41	678.64	541.16	1.75%
Salmon shark	Primary	No	0.00	2.23	0.33	0.73	1.31	0.92	0.00%
Sculpin	NA	No	6.23	4.08	8.48	8.30	13.21	8.06	0.03%
Sculpin, unidentified	NA	No	2.85	0.20	0.29	0.19	1.65	1.04	0.00%
Scypho jellies	Secondary	No	5.13	1.63	8.07	0.54	0.97	3.27	0.01%
Sea anemone, unidentified	NA	No	2.15	1.14	1.28	0.79	0.50	1.17	0.00%
Sea pens, whips	Habitat	Yes	0.06	0.00	0.02	0.03	0.00	0.02	0.00%
Sea star	Secondary	No	1.68	3.51	1.81	3.65	5.69	3.27	0.01%
Shark	NA	No	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Sharpchin rockfish	Primary	No	92.56	96.18	138.24	116.31	162.77	121.21	0.39%
Shortraker rockfish	Primary	No	243.13	237.94	290.82	253.57	268.01	258.70	0.84%
Silvergray rockfish	Primary	No	24.89	29.88	45.20	43.25	22.39	33.12	0.11%
Skate	NA	No	4.51	3.21	2.84	6.26	10.31	5.43	0.02%
Snails	NA	No	0.10	0.26	0.18	0.18	6.19	1.38	0.00%
Spiny dogfish	Primary	No	2.23	2.29	3.46	26.19	37.51	14.34	0.05%
Sponge, unidentified	NA	No	1.81	5.45	2.88	3.20	14.63	5.60	0.02%
Squid	Secondary	No	19.31	24.00	11.74	21.98	28.78	21.16	0.07%
Thornyhead rockfish	Primary	No	242.94	219.63	336.41	360.02	357.84	303.37	0.98%
Tiger rockfish	Primary	No	1.22	2.90	1.27	0.79	0.88	1.41	0.00%
Turbot	Primary	No	0.00	0.00	0.00	0.67	0.00	0.13	0.00%
Urchins, dollars, cucumbers	Secondary	No	0.21	0.99	0.34	0.43	0.29	0.45	0.00%
White blotched skate	Primary	No	0.00	0.00	0.00	1.14	1.07	0.44	0.00%
Widow rockfish	Primary	No	20.07	9.03	12.52	16.26	26.04	16.78	0.05%
Yellow Irish lord	Secondary	No	3.70	19.97	5.15	10.81	16.33	11.19	0.04%



Yelloweye rockfish	Primary	No	86.45	114.29	87.04	77.40	92.87	91.61	0.30%
Yellowtail rockfish	Primary	No	1.32	0.95	0.83	0.14	0.16	0.68	0.00%
Total Catch**			28,341.81	30,940.18	32,403.76	29,099.39	33,654.24	30,887.88	

Notes:

"NA" is used in place of Primary, Secondary, ETP, or Habitat when the species caught was non-specific or unidentifiable.

\* Number of individuals instead of metric tons

\*\* Does not include species with individual numbers instead of weight

### 7.3.3.4 Seabirds

There are more than 70 species of seabirds occurring over Alaskan waters that could be directly and indirectly affected by interactions with these UoAs. “Thirty-eight of these species regularly breed in Alaska and waters of the EEZ. More than 1,600 seabird colonies have been documented, ranging in size from a few pairs to 3.5 million birds” (NPFMC 2018a). The seabird breeding population is estimated at approximately 50 million birds with non-breeding migrant birds accounting for an additional 30 million birds. Most of the migrant birds are present only during the summer months (May through September). The distribution of species that breed in Alaska is well known in summer, but in some species, winter distributions are poorly documented or completely unknown (USFWS 2019).

#### Information

The U.S. Fish and Wildlife Service (USFWS) compiles data collected for seabirds at breeding colonies throughout Alaska to monitor the condition of the marine ecosystem and to evaluate the conservation status of species. Their most recent report (Dragoo et al. 2019) covers the period through 2018. With regard to breeding time, the mean hatch date was late in 60% of the monitored species in 2018, and some species’ eggs failed to hatch (e.g., murre, kittiwake) in some of the monitored colonies. Productivity was below average in 35% of species, average in 59%, and above average in 6% of species in 2018. Common murres and black-legged kittiwakes experienced widespread breeding failure in the southeastern BS and GOA, but several species (e.g., murres, black-legged kittiwakes, red-faced cormorants) exhibited higher than average productivity on Chowiet Island in the GOA. Across Alaska, 12.5% of the species/species groups had increasing population trends, 37.5% were stable, and 50% declined from 2009 and 2018. Following the 2015-2016 winter die off, there was low colony attendance, which may have caused the poor breeding performance (Dragoo et al. 2019).

Seabirds are caught incidentally in all types of fishing operations. Many factors contribute to the abundance and distribution of birds at sea, but many species are attracted to fishing vessels in order to forage on bait, offal, discards, and prey disturbed by the fishing operation. The National Oceanic and Atmospheric Administration’s (NOAA’s) Alaska Fisheries Science Center (AFSC) increased its research emphasis on seabird-fishery interactions and incorporated seabirds into ecosystems models being developed for the BSAI and GOA (e.g., Aydin et al. 2007). NMFS’s Alaska Region Catch Accounting System manages the Alaska fisheries’ catch data, using information gathered via the North Pacific Observer Program, which is administered by the AFSC Fisheries Monitoring and Analysis Division. The Observer Program collects a wide range of catch data (e.g., bycatch on non-target species, including seabirds) from onboard the fishing vessels and at onshore processing plants. In 2018, 4,423 trips (41.6%) and 492 vessels (45.4%) were monitored via observer(s) or electronic monitoring (EM), covering the Alaska groundfish fisheries. Data were collected on 408 fixed gear and trawl vessels and 7 processing facilities, totaling 40,512 observer days (AFSC and Alaska Regional Office 2019). “Observers identify each bird in their sample to the most accurate species or species group that they can. Species identification is verified for bird specimens collected through an AFSC-managed necropsy program. This program provides birds collected by observers from bycatch and ship strikes to a vendor to necropsy and verify the species identification. NOAA Fisheries is currently revising previous species identifications based on the necropsy verifications. Future versions of this report will reflect these upcoming changes” (Eich et al., 2018). In short, the necropsy program verification takes some time, and catch numbers are updated once verification is completed. Seabird bycatch estimates are updated annually though groupings remain given ongoing uncertainties. As seen in Tables 12-14, these UoAs account for a small fraction of the total seabird bycatch, with demersal longline fisheries accounting for 83% of seabird bycatch annually (Krieger et al. 2019).

As noted above, seabirds bycatch data are often consolidated into species groups. These groups and the likely individual species encountered by the UoAs (as per observer sightings [Shannon Fitzgerald pers. comm.] and Krieger et al. [2019]) within the groups are as follows:

- Auklets – none are ETP
  - Crested auklet (*Aethia cristatella*)
  - Parakeet auklet (*A. psittacula*)
  - Whiskered auklet (*A. pygmaea*)
- Shearwaters – neither are ETP
  - Short-tailed shearwater (*Puffinus tenuirostris*)
  - Sooty shearwater (*Ardenna grisea*)
- Storm petrels<sup>15</sup>

<sup>15</sup> The team has been told that fishers often times call shearwaters storm petrels so a couple observers may enter the seabird as a storm petrel. NMFS is engaged in a large review of species identifications for those where a necropsy sample exists. Subsequent corrections within the database are therefore likely to happen, meaning that future numbers in the annual reports will likely be different. In short, storm petrel bycatch numbers may become zero, which would support the opinion that storm petrels are not birds seen caught in a trawl net (Shannon Fitzgerald pers. comm.).

- Fork-tailed storm petrel (*Oceanodroma furcata*) – not ETP
- Leach's storm petrel (*O. leucorhoa*) – “vulnerable” on the International Union for Conservation of Nature (IUCN) Red List (see more details in Section 7.3.4)

## Management

Most of the regulations and measures to reduce and/or avoid seabird bycatch apply to hook-and-line fisheries (<https://www.fisheries.noaa.gov/alaska/bycatch/seabird-avoidance-gear-and-methods>), covering recordkeeping and reporting requirements; gear limitation; and specifications of seabird-avoidance gear for vessels based on the season, gear, and the type of gear used. However, all vessels are required to report seabird bycatch to the North Pacific Observer Program.

In addition to measures in place for ETP seabird species (see below), various mitigation measures are regularly investigated. For example, the U.S. West Coast and Alaska Trawl Fisheries Seabird Cable Strike Mitigation Workshop was held in November 2017. The workshop was hosted by a Steering Committee consisting of members from NOAA's Northwest Fisheries Science Center, AFSC, and the Alaska Regional Office. The goal of the workshop was to identify effective, practical mitigation measures to reduce seabird cable strike mortality in the catcher-processor (CP) west coast hake and Alaska trawl fisheries (Jannot et al. 2018). Workshop participants decided that the following physical mitigation measures should be prioritized:

1. Snatch block
2. Water deterrent
3. Visibility of third wire
4. Combination of warp booms
5. Third wire float device

This workshop was the first held on the subject, and the plan is to have it be a recurring activity. Additionally, the following next steps were proposed at the conclusion of the workshop:

- Explore funding opportunities
- Specific to Alaska, continue to be collect seabird mortality data (through the North Pacific Groundfish and Halibut Observer Program); analyze, summarize, and publish cable strike data; complete 2010-2016 seabird bycatch data analysis (Eich et al. 2017, 2018) to provide information on scope problem for Alaska trawl fisheries; and engage with specialists on how additional seabird data can be extrapolated to fleetwide estimates
- Specific to industry, produce technical paper (with assistance from NMFS) on importance and application of hard-wired net monitoring devices for submission to the Agreement on the Conservation of Albatrosses and Petrels (ACAP) Seabird Bycatch Working Group (Jannot et al. 2019) and fabricate and test the various physical mitigation measure options

## Auklets

The BSAI UoAs (1-3) have had some level of interaction with auklets over the period of 2014-2018 (Tables 12-13). As noted above, the three relevant auklet species are crested, parakeet, and whiskered auklets (Shannon Fitzgerald pers. comm.). The global population estimates for the three species are >8,200,000, >1,200,000, and >100,000 individuals, respectively (del Hoyo et al. 1996). While these population estimates are dated and likely in decline due to predation by invasive species, pollution, and climate change, the three relevant species have been labeled as “least concern” on the IUCN due to their extremely high population estimates. Therefore, the impact from these UoAs is relatively minimal.

## Northern fulmar

The most common seabird species caught as bycatch in these UoAs, and bottom trawl fisheries overall, continues to be northern fulmar. Most of this bycatch occurs in the BSAI with a minimal amount occurring in the GOA (Krieger et al. 2019). All of the UoAs assessed in this report have had some level of interaction with northern fulmar over the period of 2014-2018 (Tables 12-14). According to Krieger et al. (2019), northern fulmar catches across all groundfish fisheries decreased on average 11% during the period of 2010-2017. Over the time period of 2010-2018, the average annual mortality of northern fulmar from all groundfish fisheries has been 3,634. However, “when compared to estimates of total population size of northern fulmar in Alaska of 1.4 million birds (Denlinger 2006), observed fisheries account for an annual mortality of 0.26%” (Krieger et al. 2019). Therefore, the impact from these UoAs is relatively minimal.

## Shearwaters

Shearwaters were the third most common seabirds caught in 2018 (13% covering all groundfish fisheries) in 2018. Overall, shearwater bycatch decreased by 63% from 2017 to 2018 and, in 2018, was 20% below the 2010-2017 average. Over the time period of 2010-2018, the average annual mortality of shearwaters from all groundfish fisheries has been 957 (Krieger et al. 2019). The BSAI UoAs (1-3) have had some level of interaction with shearwaters over the period of 2014-2018 (Tables 12-13). While grouped within the observer data, based on subsequent necropsy, 60% or more were short-tailed shearwater, and the others were sooty shearwater (Shannon Fitzgerald pers. comm.). The worldwide populations of short-tailed and sooty shearwaters totals around 43 million birds (Denlinger 2006; calculated from Table 2 in Eich et al. 2016). Therefore, the impact from these UoAs is relatively minimal.

### **Storm petrels**

As noted above, the two relevant storm petrel species are fork-tailed and Leach's storm petrels. (The former will be discussed here and the latter in the ETP section below.) Few storm petrels have been returned for necropsy, but they were mostly taken as part of a vessel collision; most have been Leach's storm petrels (Shannon Fitzgerald pers. comm.). "This year (2018) was the first year in the current time series that storm petrel (Family *Hydrobatidae*) bycatch occurred in [the groundfish] fishery" (Eich et al. 2018). The BSAI Atka mackerel UoA caught 197 individuals in 2018 (Table 12). The estimated global population for the fork-tailed storm petrel is >6,000,000 individuals and is thought to be increasing due to the recolonization of several islands (Brooke 2004). Therefore, the impact from the UoA is relatively minimal.

### **7.3.3.5 Sharks**

Sharks are primary species, though not main in these UoAs because they are a managed stock complex. Therefore, shark finning must be considered. According to NOAA, shark finning in the United States has been prohibited since 2000. The Shark Finning Prohibition Act of 2000, which amended the MSFCMA, "prohibits any person under U.S. jurisdiction from engaging in the finning of sharks, possessing shark fins aboard a fishing vessel without the corresponding carcass, and landing shark fins without the corresponding carcass... The Shark Conservation Act required that all sharks in the United States, with one exception, be brought to shore with their fins naturally attached" (NMFS 2019a). (The exception pertains to those commercially fishing for smooth dogfish.) With regard to these UoAs, sharks are not retained and are typically discarded whole. These vessels have two observers onboard at all times, and since there have been no enforcement violations, it can be concluded that shark finning is not occurring.

### **7.3.3.6 Cumulative impacts on primary and secondary species**

The MSC Fisheries Certification Requirements (MSC 2014) require consideration of the cumulative impact on primary and secondary species. That is, in a full assessment, these UoAs would need to consider other MSC UoAs<sup>16</sup>. If a main primary species is below its PRI, there needs to be evidence of recovery or an effective strategy in place between all MSC UoAs that categorize the species as main. If a main secondary species is below its biologically based limit and the catch of that species is "considerable"<sup>17</sup>, there needs to be evidence of recovery or an effective strategy in place between all MSC UoAs that have considerable catch of the species.

The relevant MSC UoAs are BSAI pollock, GOA pollock, BSAI flatfish, GOA flatfish, BSAI Pacific cod, and GOA Pacific cod. These fisheries are currently being reassessed, but the necessary data were gathered from the Announcement Comment Draft Reports. Therefore, Table 15, which shows the likely breakdown of main primary and main secondary species for those UoAs, will need to be updated to reflect changes made following subsequent reviews. In short, it is likely that there are some species that would trigger the cumulative impacts consideration for both primary and secondary species.

**Table 17. Likely main primary and secondary species for the relevant MSC UoAs. (The UoAs assessed in this report are shaded in gray.)**

<b>MSC UoAs</b>	<b>Main primary species</b>	<b>Main secondary species</b>
BSAI Atka mackerel	None	Crested, parakeet, and whiskered auklet; northern fulmar; short-tailed and

<sup>16</sup> MSC (2014) defines "MSC UoAs" as "those UoAs that are in assessment or certified at the time the UoA announces its assessment or reassessment on the MSC website."

<sup>17</sup> MSC (2014) defines "considerable" catch as "those where main secondary species comprises more than 10% of the catch by weight of the UoA."

		sooty shearwater; fork-tailed storm petrel
BSAI flatfish	Pacific cod Pollock	Crested, parakeet, and whiskered auklet; glaucous, glaucous-winged, and arctic herring gull; northern fulmar; common and thick-billed murre; short- tailed and sooty shearwater
BSAI Pacific cod	TBD	TBD
BSAI Pacific Ocean perch and northern rockfish	None	Crested, parakeet, and whiskered auklet; northern fulmar; short-tailed and sooty shearwater
BSAI pollock	TBD	TBD
GOA flatfish	Pacific cod	Northern fulmar
GOA northern rockfish, Pacific Ocean perch, and dusky rockfish	None	Northern fulmar
GOA Pacific cod	TBD	TBD
GOA pollock	TBD	TBD

#### 5.3.4 ETP species

There are a some ETP species that interact with the UoA. Table 16 lists these species and the management measures that require their protection. The Endangered Species Act (ESA) was established in 1973 and carries out the provisions in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The ESA aims to conserve endangered and threatened fish, wildlife, and plant species and is administered by the USFWS and the NOAA's NMFS. With regard to fishing activities, the USFWS allows a certain level of "incidental take" of a listed species in cases where "an action may adversely affect a species but not jeopardize its continued existence" (USFWS, 2017).

**Table 18. The protection measures and status (where relevant) of the ETP species encountered by these UoAs. Sources: Helker et al. 2017, NMFS 2019b, <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0FS>, <https://www.iucnredlist.org/species/17367725/66991984>, <https://acap.aq/en/acap-species/307-acap-species-list/file>, <https://www.iucnredlist.org/species/132438298/132438484>**

Species	UoA(s)	Protection Measure and Status					
		NOAA PSC	ESA	MMPA	ACAP	CITES Appx. I	IUCN Red List
<i>Marine mammals</i>							
Bearded sea lion (Alaska)	1			LOF			
Killer whale (eastern North Pacific Alaska resident)	2, 3			LOF			

Killer whale (GOA, AI, and BS transient)	2, 3			LOF			
Ribbon seal (Alaska)	1			LOF			
Ribbon seal (Alaska)	2, 3			X			
Steller sea lion (western US stock)	1, 4, 5, 6		Endangered	LOF			Endangered
<b>Fish and crustaceans</b>							
Bairdi tanner crab	All	X					
Blue king crab	All	X					
Chinook salmon	All	X					
Golden king crab	All	X					
Non-chinook salmon	All	X					
Opilio tanner crab	All	X					
Pacific halibut	All	X					
Pacific herring	All	X					
Red king crab	All	X					
<b>Seabirds</b>							
Laysan albatross	2, 3				X		
Leach's storm petrel	1						Vulnerable

CITES is a multilateral treaty established to protect endangered plants and animals. It was drafted at a meeting of members of the IUCN and became effective in 1975. It aims to ensure that the international trade of wild animals and plants does not threaten the survival of these species, and it extends varying degrees of protection to more than 35,000 animal and plant species. Each CITES-protected species is assigned an appendix, which specifies the extent of the threat and the trade controls applied to that species. CITES Appendix I, the highest level, includes the species that are threatened with extinction and are, or may be, affected by trade.

The Marine Mammal Protection Act (MMPA) was enacted in 1972 in response to increasing concerns that human activity was causing significant declines in some marine mammal populations. All marine mammals in U.S. waters are protected by the MMPA, which is implemented by NMFS, USFWS, and the Marine Mammal Commission. NMFS performs various conservation and management actions, including:

- Development and implementation of conservation plans for depleted species
- Development and implementation of take-reduction plans to minimize commercial fishing bycatch
- Coordination of the Marine Mammal Health and Stranding Response Program and investigation of unusual mortality events
- Collaboration with other nations to ensure that international trade does not threaten marine mammals
- Investigation and prosecution of MMPA violations

Required by the MMPA, NMFS publishes its List of Fisheries (LOF), which classifies commercial fisheries into one of three categories (I, II, and III) based on the level of incidental marine mammal mortality or serious injury that occurs. Category I and II mean there are “frequent interactions” and “occasional interactions”, respectively. Category III means there is a “remote likelihood of/no known interactions”. The classification dictates whether or not fishers are subject to actions, such as observer coverage and take-reduction plan requirements.

The MMPA limits the number of each marine mammal species that can be killed as part of fishing activities. This is the potential biological removal (PBR) level, which is defined as “the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population” (<https://www.fisheries.noaa.gov/insight/glossary-marine-mammal-protection-act-definitions>).

ACAP is a multilateral agreement that was introduced in 2004. It seeks to protect albatrosses and petrels by coordinating international activities to mitigate known population threats. There are currently 13 member countries, and while the United States is not one of them, the MSC requirements state that ACAP shall be considered, nonetheless. ACAP currently covers 31 species of albatrosses, petrels, and shearwaters.

The IUCN Red List of Threatened Species was introduced in 1994 with the goal of providing information and analyses on the status, trends, and threats to species in order to inform and catalyze conservation action. To achieve this goal, The IUCN Red List aims to:

- Establish a baseline for monitoring species status changes
- Provide a global context for the establishment of local level conservation priorities
- Monitor, on a continuing basis, the status of a representative selection of species that covers all major ecosystems

Table 17 provides interaction data and relevant catch limit information for the ETP species encountered by the UoAs, and Table 18 summarizes the PSC limits in BSAI and GOA. Figures 7 and 8 illustrate crab zones 1 and 2 and the *Chionoecetes opilio* bycatch limitation zone (COBLZ), respectively. In short, if a fishery reaches the limit or seasonal apportionment (where applicable), the management area or bycatch zone (where applicable) will be closed to that fishery (or specified components thereof) for the year or season.

**Table 19. ETP species encountered by the UoAs, the catch limits set for these species, and the level of impact the fishery has on each species. Sources: Helker et al. 2017; Muto et al. 2018, 2019; NMFS 2019c; NPFMC 2018a, 2019b; <https://www.govinfo.gov/content/pkg/FR-2018-02-27/pdf/2018-03918.pdf>; <https://www.govinfo.gov/content/pkg/FR-2018-03-01/pdf/2018-04124.pdf>**

Species	National and/or International Limits			
	Yes/No (and Type)	Annual Limit	UoA Catch (and Year*)	UoA within Limit?
<b>Marine mammals</b>				
Bearded seal	Yes (PBR)	8,210	UoA 1: 0 (2015)	Yes
Killer whale (eastern North Pacific Alaska resident)	Yes (PBR)	24	UoAs 2 & 3: 0 (2015)	Yes
Killer whale (GOA, AI, and BS transient)	Yes (PBR)	5.87	UoAs 2 & 3: 0 (2015)	Yes
Ribbon seal	Yes (PBR)	9,785	UoA 1: 0 (2015) UoAs 2 & 3: 0 (2015)	UoA 1: Yes UoAs 2 & 3: Yes
Steller sea lion	Yes (PBR)	326	UoA 1: 0 (2015) UoAs 4-6: 1 (2015)	Yes
<b>Fish and crustaceans</b>				
Bairdi tanner crab	Yes (PSC)	UoAs 1-3: 749,210 (zone 1); 1,855,694 (zone 2) UoAs 4-6: NA	UoA 1: 0 (2018) UoAs 2 & 3: 844.03 (2018) UoAs 4-6: 201.9 (2018)	UoAs 1-3: Yes UoAs 4-6: NA
Blue king crab	Yes (PSC)	NA	UoA 1: 0 (2018) UoAs 2 & 3: 0 (2018) UoAs 4-6: 0 (2018)	NA
Chinook salmon	Yes (PSC)	UoAs 1-3: NA UoAs 4-6: 8,340	UoA 1: 650.39 (2018) UoAs 2 & 3: 275 (2018) UoAs 4-6: 325.36 (2018)	UoAs 1-3: NA UoAs 4-6: Yes
Golden king crab	Yes (PSC)	NA	UoA 1: 7,073.74 (2018) UoAs 2 & 3: 4,950.55 (2018) UoAs 4-6: 323.92 (2018)	NA
Non-chinook salmon	Yes (PSC)	NA	UoA 1: 1,476.44 (2018) UoAs 2 & 3: 764 (2018) UoAs 4-6: 314.53 (2018)	NA
Opilio tanner crab	Yes (PSC)	UoAs 1-3: 7,596,677 (COBLZ) UoAs 4-6: NA	UoA 1: 0 (2018) UoAs 2 & 3: 14,541.06 (2018) UoAs 4-6: 0 (2018)	UoAs 1-3: Yes UoAs 4-6: NA
Pacific halibut**	Yes (PSC)	UoAs 1-3: 2,490 UoAs 4-6: 1,706	UoA 1: 110.97 (2018) UoAs 2 & 3: 20.89 (2018) UoAs 4-6: 79.19 (2018)	Yes
Pacific herring**	Yes (PSC)	UoA 1: 30 <sup>#</sup> UoAs 2 & 3: 5 UoAs 4-6: NA	UoA 1: 0 (2018) UoAs 2 & 3: 0.04 (2018) UoAs 4-6: 0.01 (2018)	UoA 1: Yes UoAs 2 & 3: Yes UoAs 4-6: NA
Red king crab	Yes (PSC)	UoAs 1-3: 80,161 (zone 1)	UoA 1: 239 (2018) UoAs 2 & 3: 477.03 (2018)	UoAs 1-3: Yes UoAs 4-6: NA

		UoAs 4-6: NA	UoAs 4-6: 0.05 (2018)	
<b>Seabirds</b>				
Laysan albatross	No	-	UoAs 2 & 3: 93 (2018)	-
Leach's storm petrels	No	-	UoA 1: 197 <sup>^</sup> (2018)	-

**Notes:**

"Catch" means fatal interaction (i.e., mortally wounded or killed by gear or fatal removal from gear).

"Year" is the most recent year (2015 or after) with data and fatal interaction.

"NA" means there is not a specific hard limit for that species/stock. Typically, this is the case when other protection measures have been deemed better (e.g., the Pribilof Islands Habitat Conservation Area is closed to all trawling because that is where the blue king crab stock is concentrated).

\* Used most recent year with data.

\*\* Catch in metric tons (versus other species, which are in number of animals)

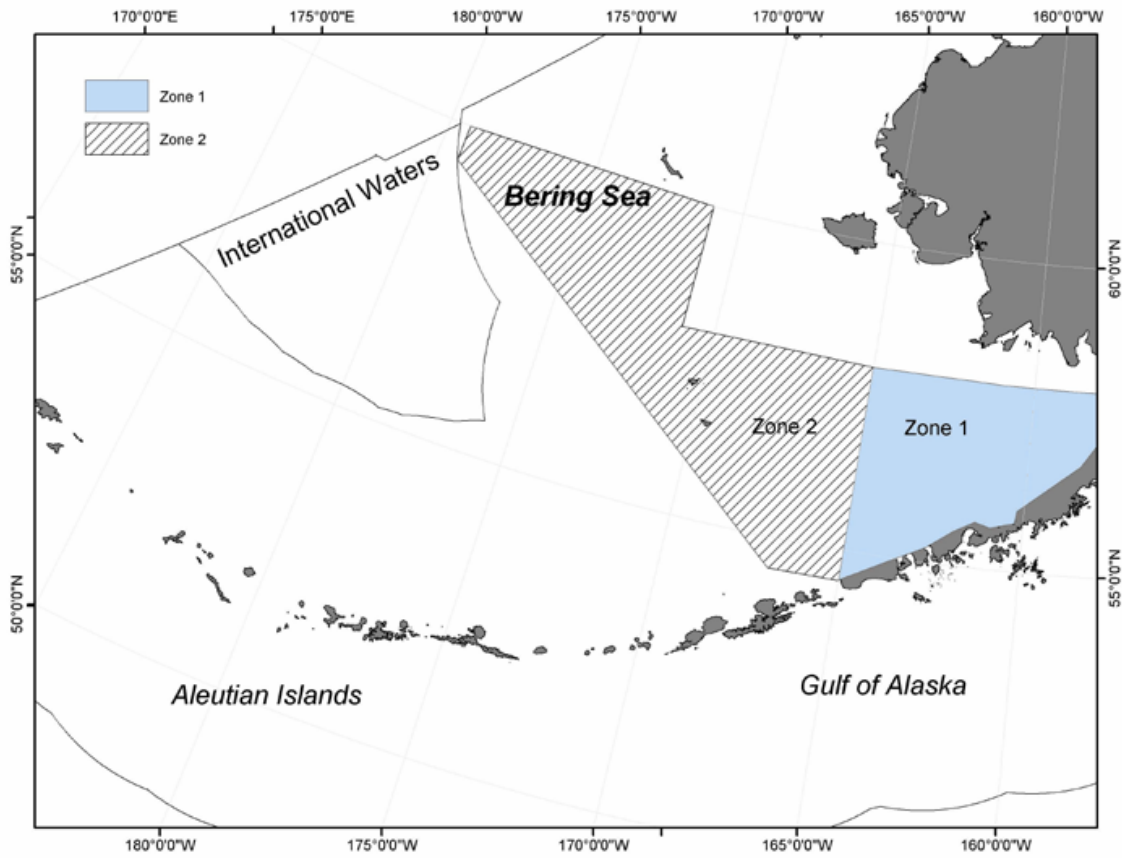
# Covers catch from non-pelagic trawl pollock, Atka mackerel, and "other species" (i.e., skates, sculpins, sharks, squids, and octopuses)

<sup>^</sup> Due to the species grouping of storm petrels, this number is the total across both species. The species' individual catch numbers are unknown so the total is listed.

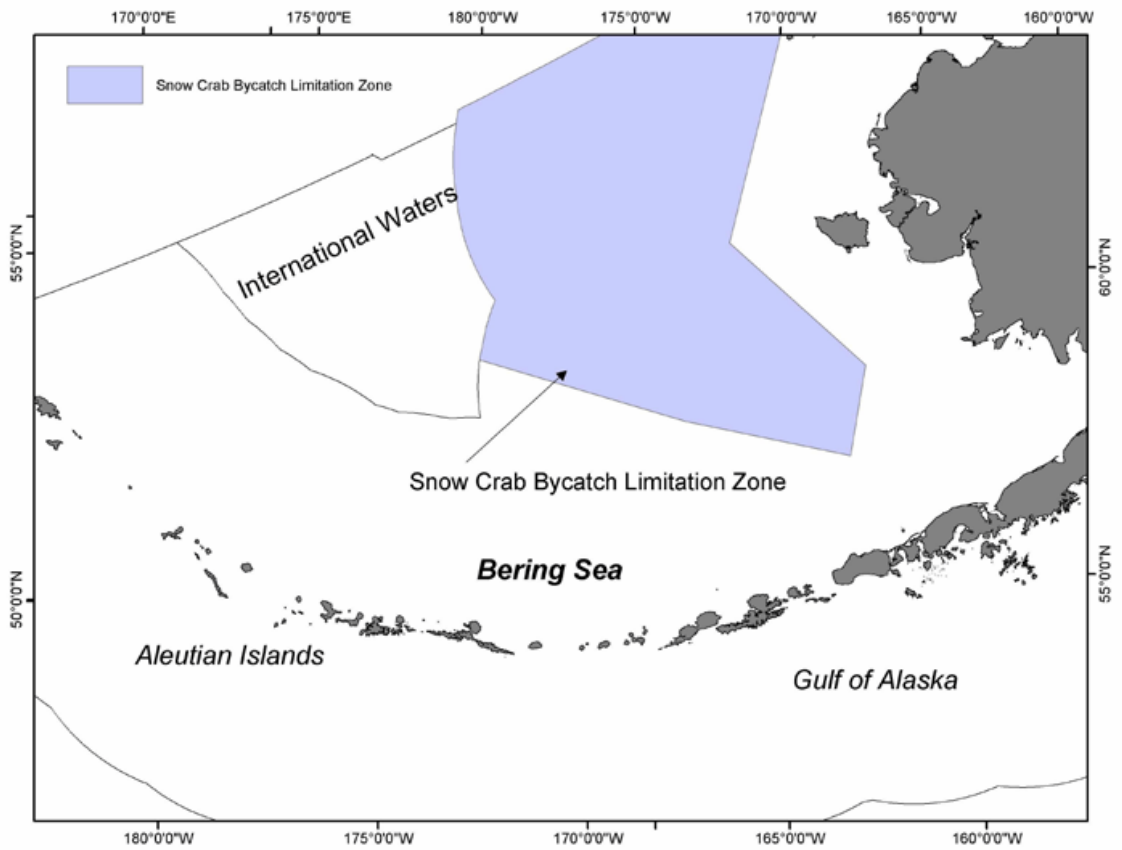
**Table 20. Summary of the relevant PSC limits in BSAI and GOA. Sources: NPFMC 2018a, 2018b**

Species	Limit Details
<b>BSAI</b>	
<i>C. bairdi</i>	PSC limit is based on abundance and apportioned by sector. Limits are for zones 1 and 2, each which would close if their respective limits were reached.
<i>C. opilio</i>	PSC limit is based on abundance with minimum and maximum levels and apportioned by sector. Limits are for the COBLZ, which would close to any sector that reaches its limit.
Chinook salmon	PSC limits apply to the directed pollock fishery. The AI subarea is specified separately (most recent was 700 animals, split between community development quota [CDQ] and non-CDQ fisheries). The BS subarea has several defined levels possible, depending on factors such as annual abundance, past performance, and whether incentive plan agreements are formed (most recent was the maximum possible of 60,000 animals, split across A and B seasons and the various American Fisheries Act [AFA] sectors).
Other salmon	PSC limit applies to pollock trawlers in the Catcher Vessel Operational Area from August 15 to October 14 and split between CDQ and non-CDQ; most recent was 42,000 animals. If reached, fishing is prohibited in the chum salmon savings area from September 14 to October 14 unless the vessel is operating under an incentive plan agreement.
Pacific halibut	PSC limit is apportioned by target fishery; most recent apportionments are (in metric tons): 1,745 for Amendment 80, 745 for trawl limited access, 315 for CDQ, and 710 for non-trawl.
Pacific herring	PSC limit applies to trawl fisheries and is set to 1% of the annual herring biomass for the EBS. If reached, the three herring savings areas may be closed for their respective seasons.
Red king crab	PSC limit depends on thresholds for mature female biomass and SSB and applies to zone 1; the possible zone 1 limits are 32,000 animals, 97,000 animal, or 197,000 animals and are apportioned by sector.
<b>GOA</b>	
Chinook salmon	Separate PSC limits for the western and central GOA are established for the pollock trawl fishery. In 2018, these were 6,684 animals and 18,316 animals, respectively. For non-pollock trawl, limits are for the combined GOA by sector; in 2018, these were 4,080 animals for CPs, 3,060 animals for catcher vessels outside of the Rockfish Program, and 1,200 for catcher vessels in the Rockfish Program.
Pacific halibut	PSC limits (in metric tons) are currently 1,706 for trawl gear, 257 for hook-and-line gear, and 9 for the (very small) demersal shelf rockfish fishery in the Southeast Outside District. These limits are further apportioned by season and trawl fishery category, as well as the Rockfish Program.





**Figure 7. Crab PSC limitation zones, which close to directed crab fishing when limits are reached as per Table 1. Source: NPFMC 2018a**



**Figure 8. The COBLZ, which is closed to directed *C. opilio* (tanner) crab fishing for the rest of the season or year as per Table 18. Source: NPFMC 2018a**

#### 5.3.4.1 Marine mammals

##### **Bearded seal**

In the Pacific, the bearded seal (*Erignathus barbatus nauticus*) is found from the Arctic Ocean (85°N) south to Sakhalin Island (45°N), inhabiting seasonally ice-covered seas. There are two subspecies: *E. b. barbatus* (Laptev Sea, Barents Sea, North Atlantic Ocean, and Hudson Bay [Rice 1998]) and *E. b. nauticus* (remaining portions of the Arctic Ocean and the Bering and Okhotsk Seas [Ognev 1935; Scheffer 1958; Manning 1974; Heptner et al. 1976]). The Alaska stock's distribution is shown in Figure 9.

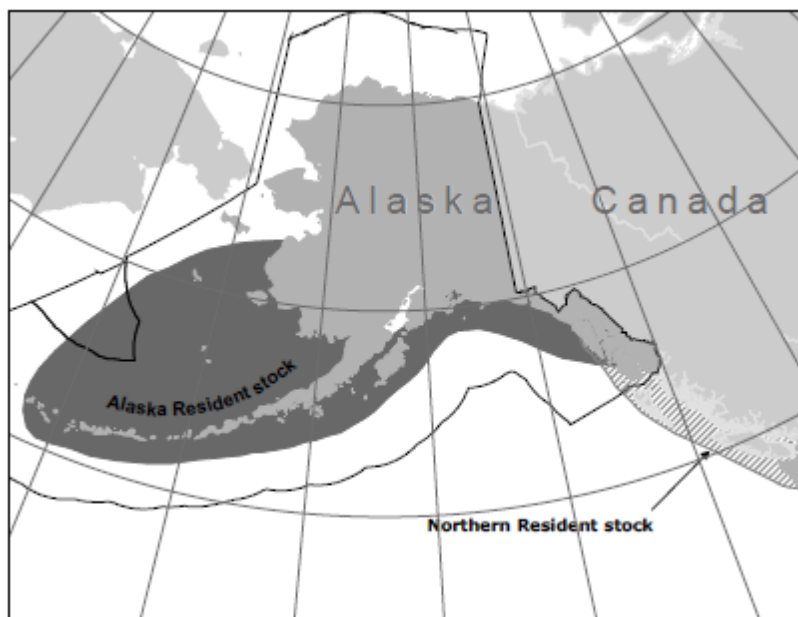


**Figure 9. Approximate distribution of the bearded seal population in Alaska (dark gray), combining summer and winter distribution. Source: Muto et al. 2018**

The most recent stock assessment report (2018) estimated the population in U.S. waters to be 301,836 (Muto et al. 2019). According to the 2019 LOF, the BSAI Atka mackerel UoA is a Category III, meaning there is a remote likelihood of or no known interactions with this stock. Various human impacts (e.g., fishing) have known effects on the species. With regards to fishing, trawls have been linked to mortalities. The PBR for U.S. portion of the BS is 8,210, though this is not a PBR for the entire stock because a reliable stock assessment of the entire stock is not available. This UoA had one observed interaction in 2015 (Table 17). Therefore, it likely has a negligible impact on the population.

##### **Killer whale (eastern North Pacific Alaska resident)**

The killer whale (*Orcinus orca*) has been found in all oceans and seas around the world. While they have been reported in tropical waters, they occur in higher densities in colder, more productive waters in both hemispheres. Along the U.S. west coast, they are found along the Alaska, Washington, Oregon, and California coasts as well as Washington inland waters. Pods are labelled as “resident”, “transient”, and “offshore” based on morphology, ecology, genetics, and behavior. Genetic studies have shown differences in these populations, warranting separate stock assessments (Muto et al. 2018). The Alaska resident stock's distribution is shown in Figure 10.

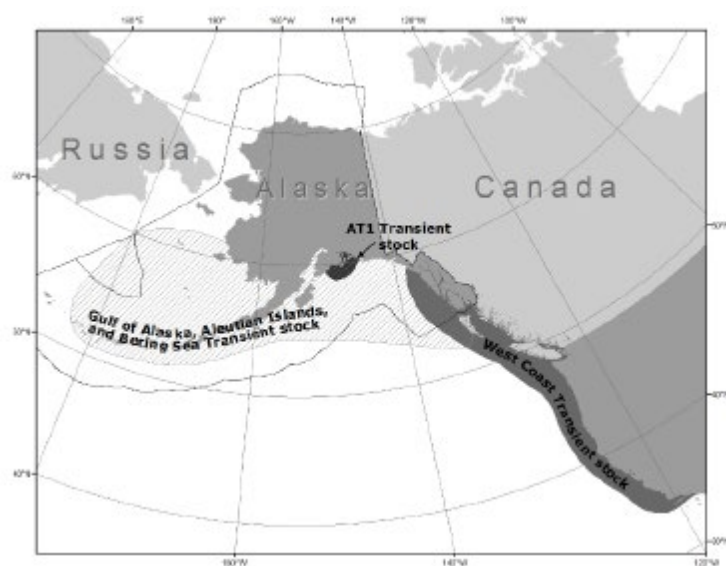


**Figure 10. Approximate distribution of the eastern North Pacific Alaska resident killer whale population (dark gray). Source: Muto et al. 2018**

The most recent stock assessment report (2016) estimated the Alaska resident population at 2,347 (Muto et al. 2018). According to the 2019 LOF, the BSAI northern rockfish and Pacific Ocean perch UoAs are a category II, meaning they have occasional interactions with this killer whale stock. Various human impacts (e.g., fishing) have known effects on the species. With regards to fishing, trawls, longlines, and pots have been linked to mortalities. The PBR for this stock is 24. These UoAs had zero observed interaction in 2015 (Table 17). Therefore, they likely have a negligible impact on the population.

#### ***Killer whale (GOA, AI, and BS transient)***

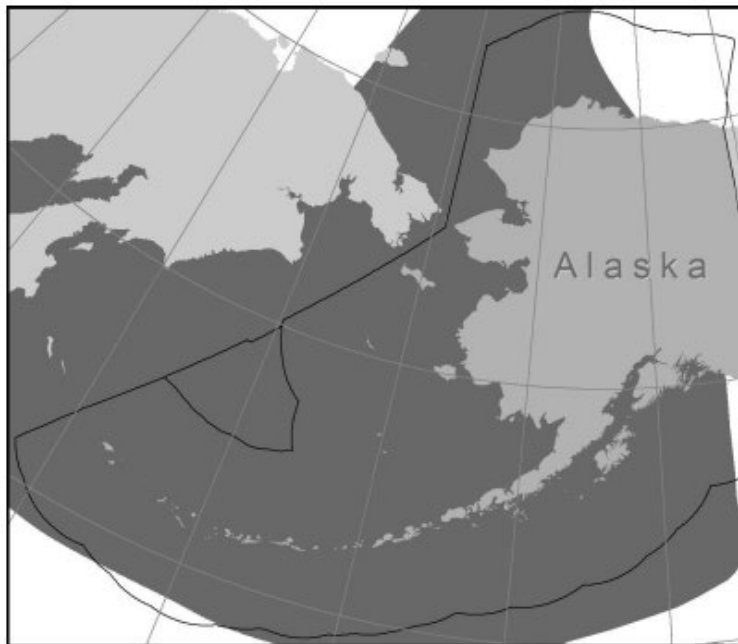
The GOA, AI, and BS transient stock's distribution is shown in Figure 11. The most recent stock assessment report (2016) estimated the Alaska resident population at 587 (Muto et al. 2018). According to the 2019 LOF, the BSAI northern rockfish and Pacific Ocean perch UoAs are a category II with regard to interactions with killer whales. Various human impacts (e.g., fishing, vessel strikes) have known effects on the species. Trawls, longlines, and pots have been linked to mortalities. The PBR for this stock is 5.87. These UoAs had zero observed interaction in 2015 (Table 17). Therefore, they likely have a negligible impact on the population.



**Figure 11. Approximate distribution of the GOA, AI, and BS transient killer whale population (light gray shaded area). Source: Muto et al. 2018**

### **Ribbon seal**

The ribbon seal (*Histiophoca fasciata*) has been found in the North Pacific Ocean and adjacent parts of the Arctic Ocean. In Alaska, they range from the North Pacific and BS to the Chukchi and western Beaufort Seas (Figure 12, Muto et al. 2018).



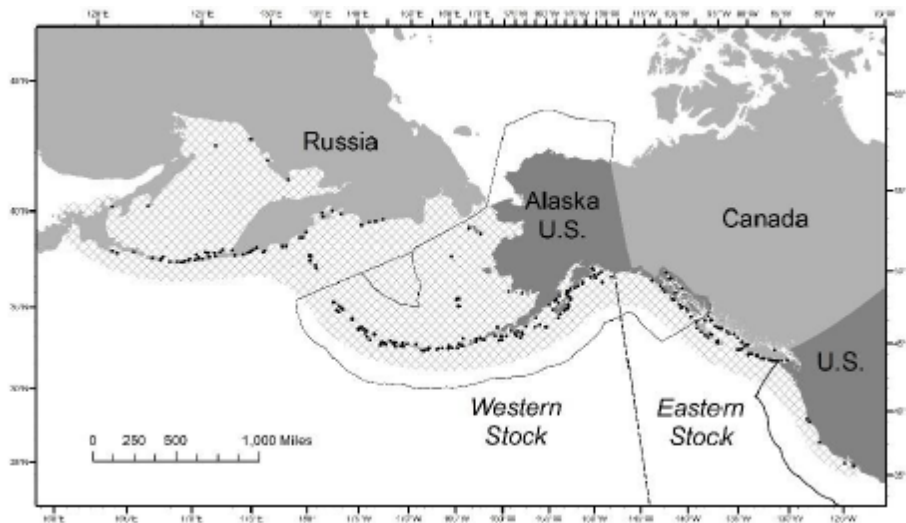
**Figure 12. Combined summer and winter distribution of the ribbon seal (dark areas) in Alaskan waters.**

**Source: Muto et al. 2018**

The most recent stock assessment report (2018) estimated the Alaska resident population at 184,697 (Muto et al. 2019). According to the 2019 LOF, the BSAI Atka mackerel UoA is a category III, meaning there is a remote likelihood of or no known interactions with ribbon seals. The BSAI northern rockfish and Pacific Ocean perch UoAs had a recent interaction (2014) with the species so are also considered here even though they were not listed on the 2019 LOF as having interactions. With regards to fishing, trawl gear has been linked to mortalities. The PBR for this stock is 9,785. The BSAI Atka mackerel, BSAI northern rockfish, and BSAI Pacific Ocean perch UoAs all had zero observed interactions in 2015 (Table 17). Therefore, they likely have a negligible impact on the population.

### **Steller sea lion (western US)**

The Steller sea lion (*Eumetopias jubatus*) is found along the North Pacific Rim from northern Japan to California (Figure 13). The most recent stock assessment report (2018) estimated the Steller sea lion western U.S. stock population at 11,952 pups and 42,315 non-pups (Muto et al. 2019). Data collected through 2017 show strong evidence that the western stock population in Alaska was at its lowest in 2002 and has increased at over 2% per year between 2002 and 2017. However, the stock is still classified as endangered on the ESA and IUCN Red List.



**Figure 13. Approximate distribution (cross-hatched area) and major U.S. haulouts and rookeries (black dots) of the Steller sea lion (both eastern and western U.S. stocks). Source: Muto et al. 2018**

According to the 2019 LOF, the BSAI Atka mackerel UoA and the GOA northern rockfish, Pacific Ocean perch, and dusky rockfish UoAs are all category III with regard to this stock. Fishing gear entanglement has been linked to mortalities. The PBR for this stock is 326. The BSAI Atka mackerel UoA had zero observed interaction in 2015, and the GOA UoAs had one in 2015 (Table 17). Therefore, they likely have a negligible impact on the population.

Critical habitat was originally designated as per 50 CFR 226.202 (August 1993) for Steller sea lions in the BSAI and GOA included 3 nm no-entry zones around rookeries and haulouts, prohibition of groundfish trawling within 10-20 nm of certain rookeries, and three special aquatic foraging areas in Alaska: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area Figure 14. The current protection measures were implemented in BS and GOA in 2003 and in AI in 2015. A suite of fishery management measures has been designed to minimize competition between fishing and the endangered population of Steller sea lions in critical habitat areas. For example, the Atka mackerel, Pacific cod, and pollock fisheries have specially designated closed areas that they also must follow. Figure 15 shows the closed area map for Atka mackerel, which resulted from the 2014 biological opinion (NMFS 2014a) and 2014 Steller sea lion EIS (NMFS 2014b). A recovery plan was first developed for Steller sea lions (both distinct population segments) in 1992 and was revised in 2008 (NFMS 2008). The revised plan highlighted the following specific recovery actions for the western distinct population segment:

- Continue population modeling and research on the key threats potentially impeding recovery
- Maintain current or equivalent levels of fishery conservation measures
- Design and implement an adaptive management program to evaluate fishery conservation measures
- Develop an implementation plan to integrate and further prioritize recovery actions

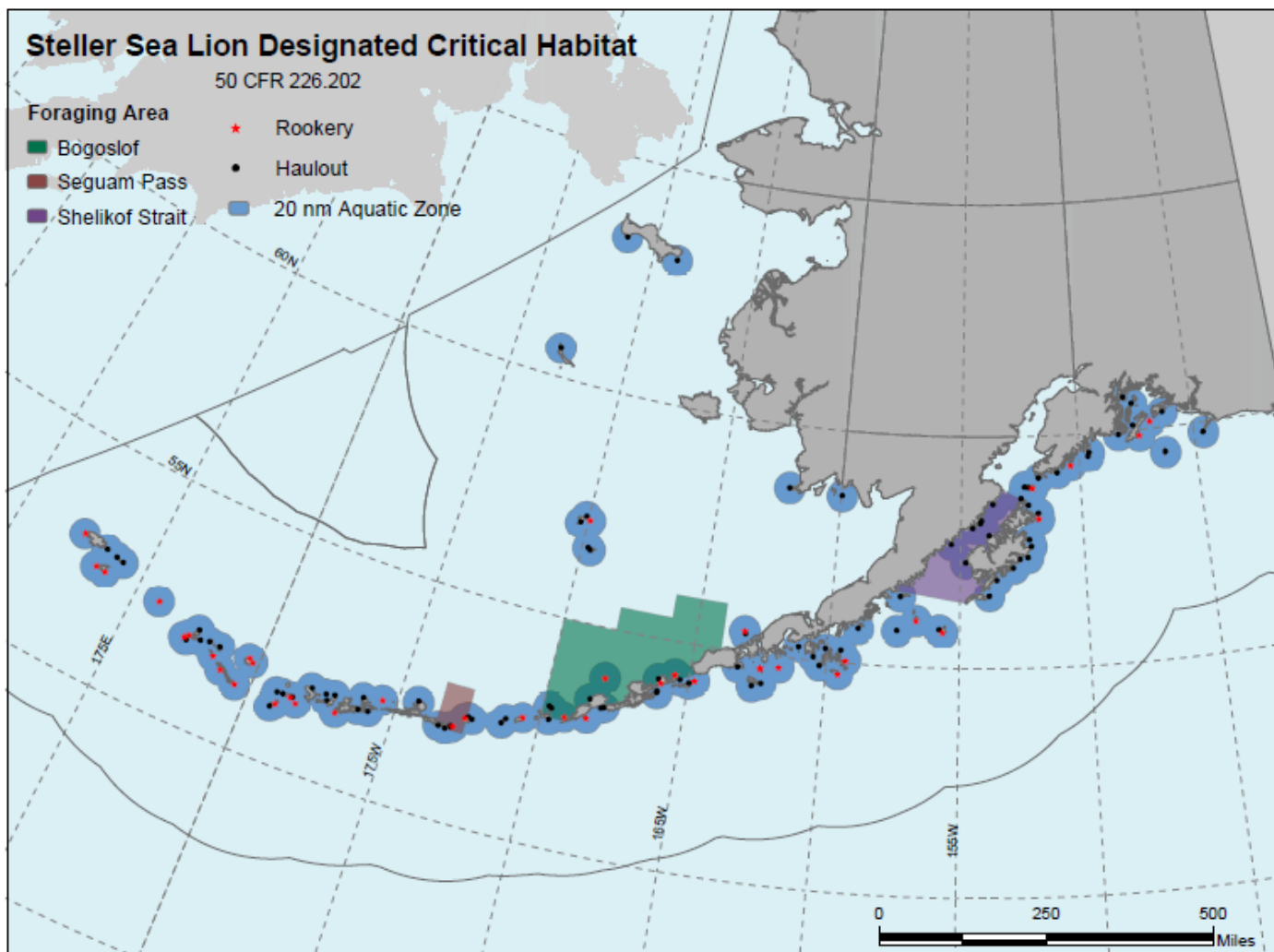
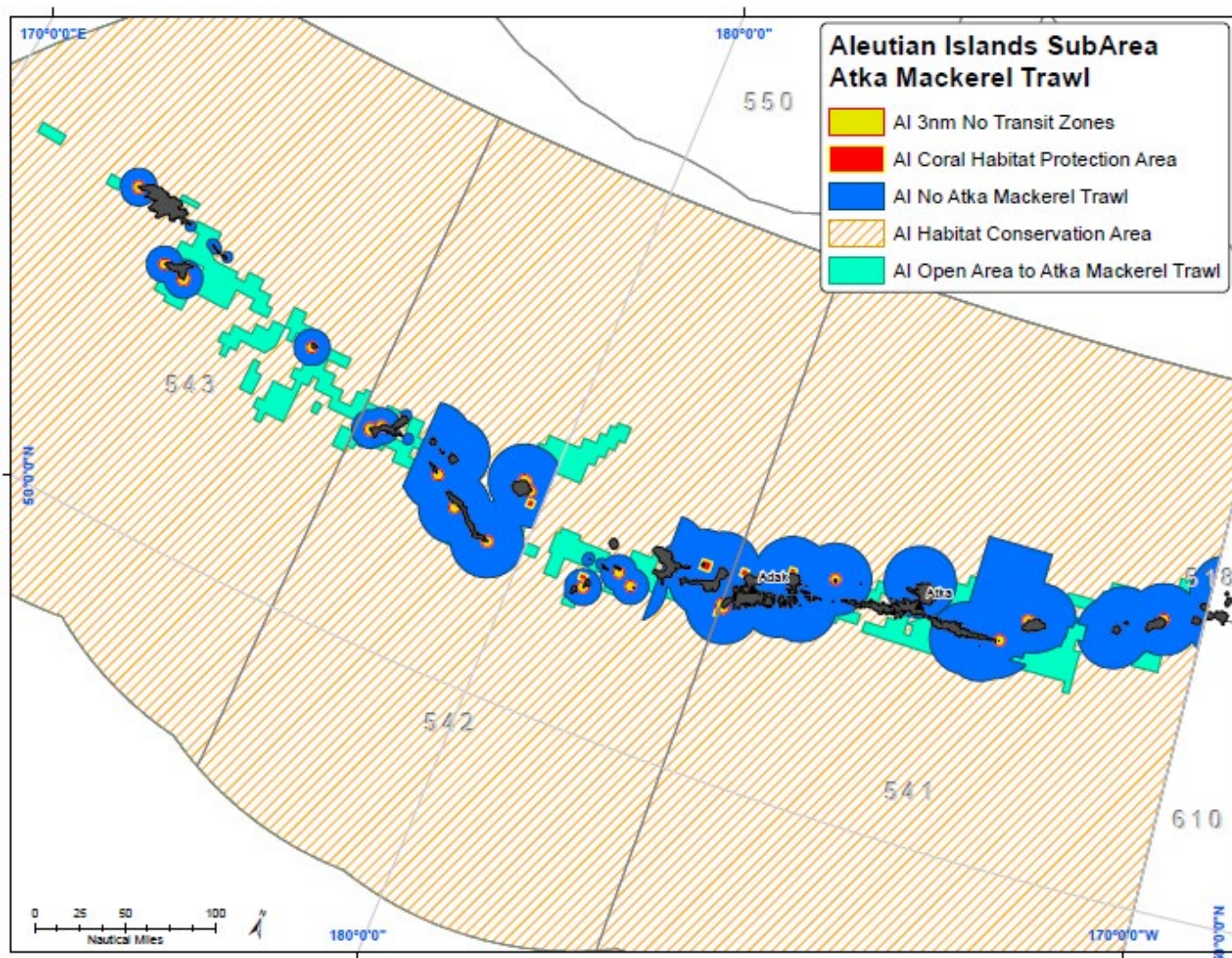


Figure 14. Designated critical habitats areas in the AI and GOA for the Steller sea lion. Source: NMFS 2019d





**Figure 15. Atka mackerel no-trawl areas (in blue) in the AI. Source: NMFS 2019e**

*The 1988 amendments [to the MMPA] also required the Secretary to implement emergency regulations to prevent further taking of Steller sea lions if more than 1,350 were taken during a calendar year. In addition, NMFS may place observers on Category I and II vessels to 1) obtain reliable estimates of incidental serious injury and mortality of marine mammals; 2) determine the reliability of reports submitted by vessel owners and operators; 3) identify changes in fishing methods or technology that may decrease incidental serious injury or mortality if necessary; 4) collect biological samples that may otherwise be unobtainable for scientific studies; and 5) record data on bycatch and discard levels of all species. The 1994 amendments to the MMPA presented a new means of identifying and weighing the cumulative anthropogenic threats to each marine mammal stock and a process for reducing fishery-specific impacts. For each stock, a Potential Biological Removal (PBR) level is calculated that represents the annual human-induced mortality the stock can sustain, based on conservative estimates of minimum population level and net productivity and then reduced by a scaled recovery factor. Source: NMFS 2008*

In short, following impact analysis of the Alaska groundfish fisheries (NMFS 2014a, 2014b), the fisheries continue to avoid adverse modification of Steller sea lion critical habitat, which is consistent with the conclusions in the Programmatic Supplemental EIS (NMFS 2004).

#### **5.3.4.2 Fish and crustaceans**

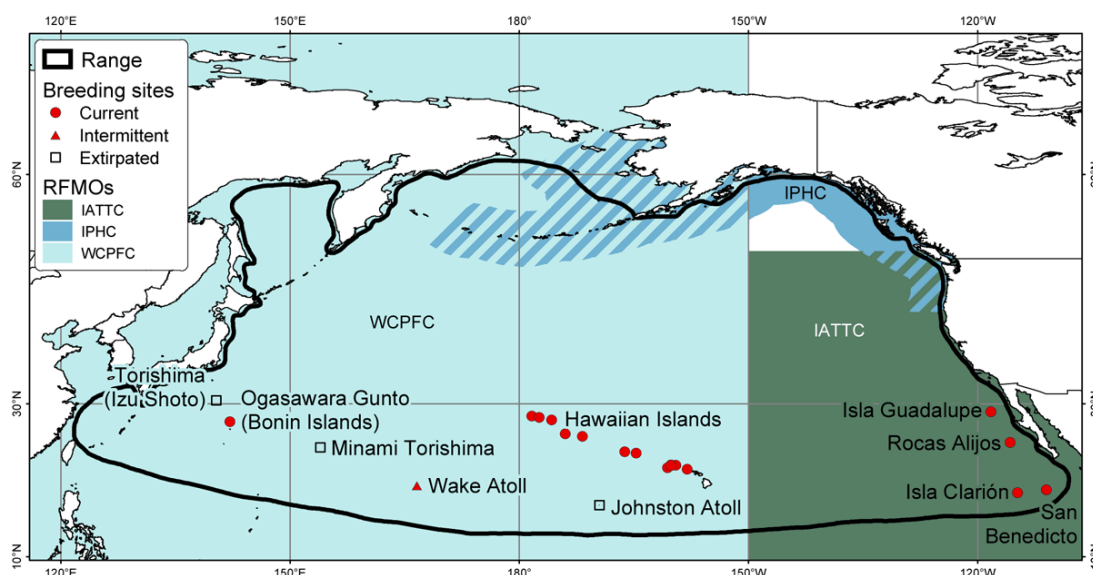
As discussed above, these “prohibited species” have PSC limits, which are measures to limit the incidental catch of these species in these UoAs. While not ETP species under the MSC definition, they have been designated as “prohibited species” in FMPs so they are considered ETP in this assessment. Table 18 highlights management measures that are in place for several of these species. All PSC species have strict catch monitoring and accounting with hard caps in place. With regard to management and the utilization of unwanted catch, there is a donation permit

program in place (<https://www.fisheries.noaa.gov/action/alaska-prohibited-species-donation-program-federal-register-rules-and-notice>). Overall, the UoAs' impact on the PSC species is likely minimal since the UoAs are within the annual limits for each of the species.

### 5.3.4.3 Seabirds

#### *Laysan albatross*

The Laysan albatross (*Phoebastria immutabilis*) breeds on tropical/subtropical islands across the North Pacific Ocean (Figure 16). The Northwestern Hawaiian Islands support >95% of the global breeding population, which in 2009, was estimated to be 591,000 breeding pairs (ACAP 2010). While the population appears to be increasing on Midway Atoll and Kaua'i with steep increases on French Frigate Shoals and O'ahu, it seems to be decreasing on Laysan Island. The population trend is unknown at all other breeding sites (ACAP 2010), but the overall population's trajectory is likely on an upward trend.



**Figure 16. Estimated range and breeding sites for the Laysan albatross inferred primarily from shipboard surveys, band recoveries, and tracking. Source: ACAP 2010**

Fisheries bycatch is a known source of mortality for Laysan albatross (Arata et al. 2009). This species is particularly vulnerable to driftnet and longline gear (Gould et al. 1998, Lewison and Crowder 2003). In 2018, the BSAI Pacific Ocean perch and northern rockfish UoAs caught 92.51 Laysan albatross. The post-capture status of these birds is unknown at this time so additional information will be needed to confirm the level of impact the UoAs have on the population.

#### *Leach's storm petrel*

The Leach's storm petrel has an extensive global range with breeding colonies mostly in the Northern Hemisphere – from the South Kuril Islands in Japan to Baja California in Mexico in the North Pacific Ocean and from northeastern North America to Iceland and northern Europe in the North Atlantic Ocean. In the winter, they migrate south to the tropics, “reaching the equator in the Pacific and as far south as south Brazil and South Africa in the Atlantic” (del Hoyo et al. 1992; Figure 17). The population is estimated at 6,700,000-8,300,000 but is decreasing (BirdLife International 2019).





**Figure 17. Global range of the Leach's storm petrel.**Source: BirdLife International 2019

The population decline is likely due to predation by invasive species (i.e., rats, mice, cats, foxes) as well as native predators (e.g., herring gulls) (BirdLife International 2019, Blackmer 2004, Stenhouse et al. 2000). As noted above, 2018 was the first year in recent history that storm petrels were encountered by the groundfish fisheries (Eich et al. 2018). The BSAI Atka mackerel UoA caught 197 storm petrels in 2018 (Table 12). Due to the grouping of bycatch data, it is unknown which storm petrel species were impacted and what the bycatch numbers were for each species. However, given the low level of bycatch, the impact from the UoA is relatively minimal.

#### 5.3.4.4 Cumulative impacts on ETP species

The MSC Fisheries Certification Requirements (MSC 2014) require consideration of the cumulative impact on ETP species. That is, where there are national and/or international limits for ETP species, the combined effects of the MSC UoAs on the population/stock need to be considered. Table 20 shows the catch data and annual limits for the relevant MSC UoAs. The combined effects of these UoAs are minimal.

**Table 21. Cumulative catch data and limits for ETP species encountered by the relevant MSC UoAs. The table only covers species/stocks with limits. Since the table includes all relevant species across all relevant MSC UoAs, in many cases where "0" is stated, the UoA does not interact with that species/stock. Sources: Helker et al. 2017; Muto et al. 2018, 2019; NMFS 2019c; NPFMC 2018a, 2019b; <https://www.govinfo.gov/content/pkg/FR-2018-02-27/pdf/2018-03918.pdf>; <https://www.govinfo.gov/content/pkg/FR-2018-03-01/pdf/2018-04124.pdf>**

Species	Year	BSAI flatfish	BSAI pollock	BSAI Pacific cod				BSAI rockfish	BSAI Atka mackerel	GOA flatfish	GOA pollock	GOA Pacific cod				GOA rockfish	Total	Annual Limit
				Trawl	Longline	Pot	Jig					Trawl	Longline	Pot	Jig			
Marine Mammals																		
Bearded seal (Alaska)	2015	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8,000
Beluga whale (Eastern Chukchi Sea, EBS, Bristol Bay, unknown stock)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Variation under management
Dall's porpoise (Alaska)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Under management
Fin whale (northeast Pacific)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gray whale	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Harbor porpoise (Bering Sea)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Under management
Harbor seal (Bering Sea)	2015	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Harbor seal (Bristol Bay)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,000
Harbor seal (GOA)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Variation under management
Harbor seal (South Kodiak)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Humpback whale (central North Pacific)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Humpback whale (western North Pacific)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Killer whale (Alaska resident)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Killer whale (eastern North Pacific Alaska)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

resident)																		
Killer whale (GOA, AI, and BS transient)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Northern elephant seal (eastern Pacific)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,
Northern fur seal (eastern Pacific)	2015	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	11,
Ribbon seal (Alaska)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,
Ringed seal (Alaska)	2015	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5,
Spotted seal (Alaska)	2015	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	12,
Steller sea lion (western US)	2015	3	1	0	2	0	0	0	0	1	5	0	1	0	0	1	14	
Walrus (Alaska)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,
<i>Crustacean and Fish</i>																		
Bairdi tanner crab	2018	176,368.02	2,238.03	?	?	?	?	844.03	0.00	233,699.21	5,373.54	?	?	?	?	201.9**	?	
Chinook	2018	1,205.41	11,169.77	?	?	?	?	275**	650.39**	1,527.80	14,820.27	?	?	?	?	325.36	?	
Opilio tanner crab	2018	1,557,383.82	5,142.71	?	?	?	?	14,541.06	0.00	0.00	0.00	?	?	?	?	0**	?	
Pacific halibut*	2018	767.79	55.81	?	?	?	?	20.89	110.97	1,176.91	289.96	?	?	?	?	79.19	?	
Pacific herring*	2018	64.28	474.24	?	?	?	?	0.04	0.00	3.17	40.22	?	?	?	?	0.01**	?	
Red king crab	2018	28,579.09	565.23	?	?	?	?	477.03	239.00	0.00	0.00	?	?	?	?	0.05**	?	

Notes:

Year = most recent year with data

\* Catch in metric tons (versus other species, which are in number of animals)

\*\* There is not a specific hard limit for that species/stock in that region. Refer to Table 17 for more details.

? = Data need to be compiled for other UoAs before table can be completed. This will occur before PCDR stage.

### 5.3.4.5 ETP species management

As discussed above, there are several regulations and measures in place to protect ETP species (Table 16). Through a series of regulations, the ESA protects several of the marine mammals and seabirds encountered by these UoAs. The MMPA and ACAP also protect marine mammals and seabirds, respectively, and NOAA's PSC limits protect various fish and crustacean species.

The BSAI and GOA FMPs include the following seabird and marine mammal management objectives:

- *Continue to cooperate with U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species.*
- *Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification of critical habitat for ESA-listed Steller sea lions.*
- *Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.*
- *Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.*

Source: NPFMC 2018a, 2018b

As part of their FMPs, the Council continues to develop a suite of objectives to reduce bycatch and bycatch mortality in the groundfish fisheries, including:

- *Continue and improve current incidental catch and bycatch management program.*
- *Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.*
- *Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.*
- *Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.*
- *Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.*
- *Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and noncommercial species.*
- *Control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures.*
- *Reduce waste to biologically and socially acceptable levels.*
- *Continue to improve the retention of groundfish where practicable, through establishment of minimum groundfish retention standards.*

Source: NPFMC 2018a, 2018b

The FMPs govern how the groundfish fisheries and the non-target species and habitat impacted by these fisheries are managed in the BSAI and GOA. The Council meets five times per year, at which time they address any FMP issues, and FMPs can be amended as needed at any time. The Council's SAFE reports are updated annually, covering various harvest specifications and management measures and considering the overlap of target stocks and protected stocks. Additionally, these UoAs have 100% observer coverage, and this information is used not only to track the UoAs' impacts on ETP species but also to aid management measure discussions and decisions.

### 5.3.5 Habitats

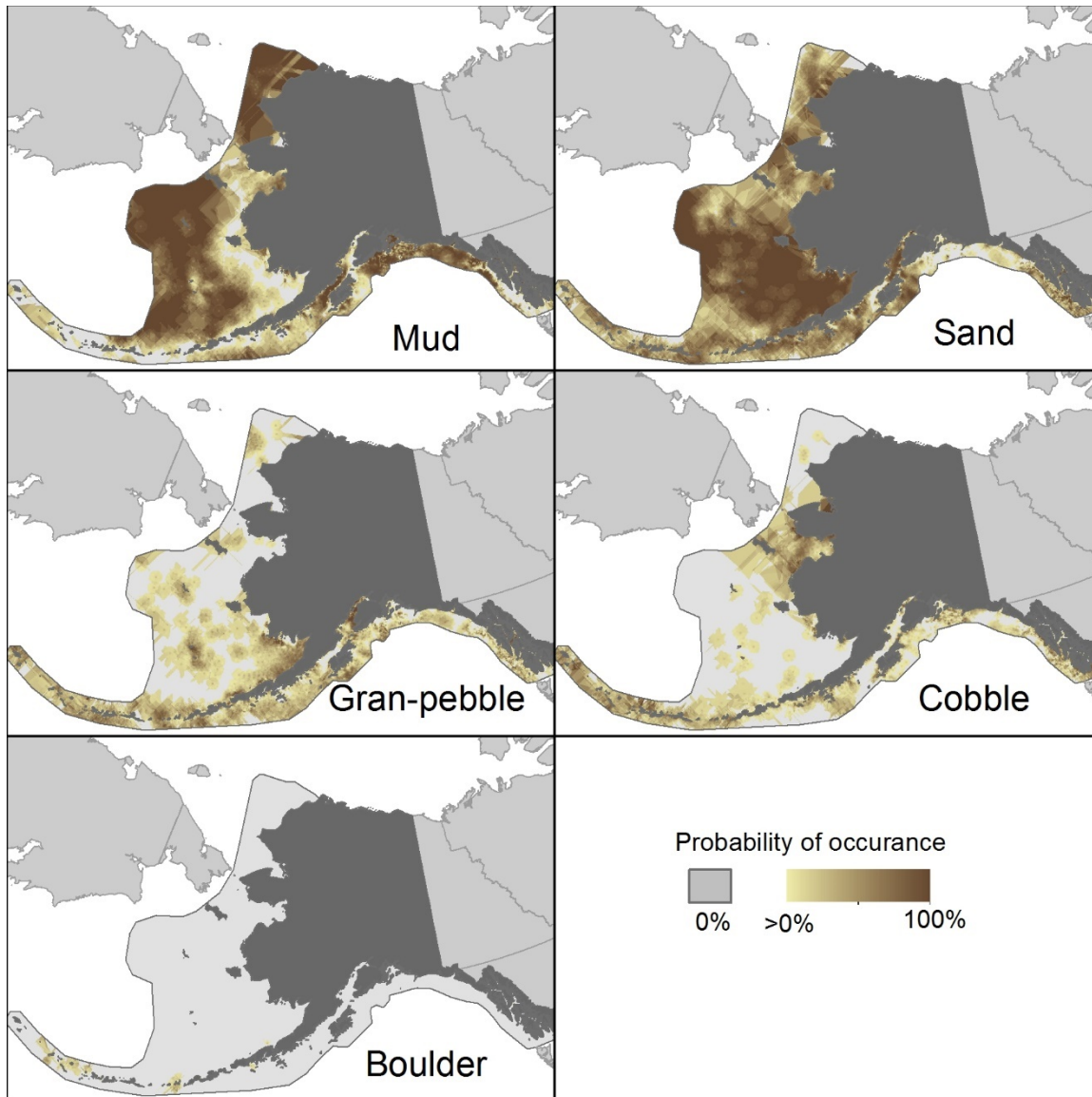
Observer coverage, catch data, and the known fishing areas of these UoAs were used to determine which habitats should be considered within this assessment. As per MSC requirements, the main habitats are those that are commonly encountered and VMEs. Each of these is discussed in more detail below.

#### 5.3.5.1 Commonly encountered habitats

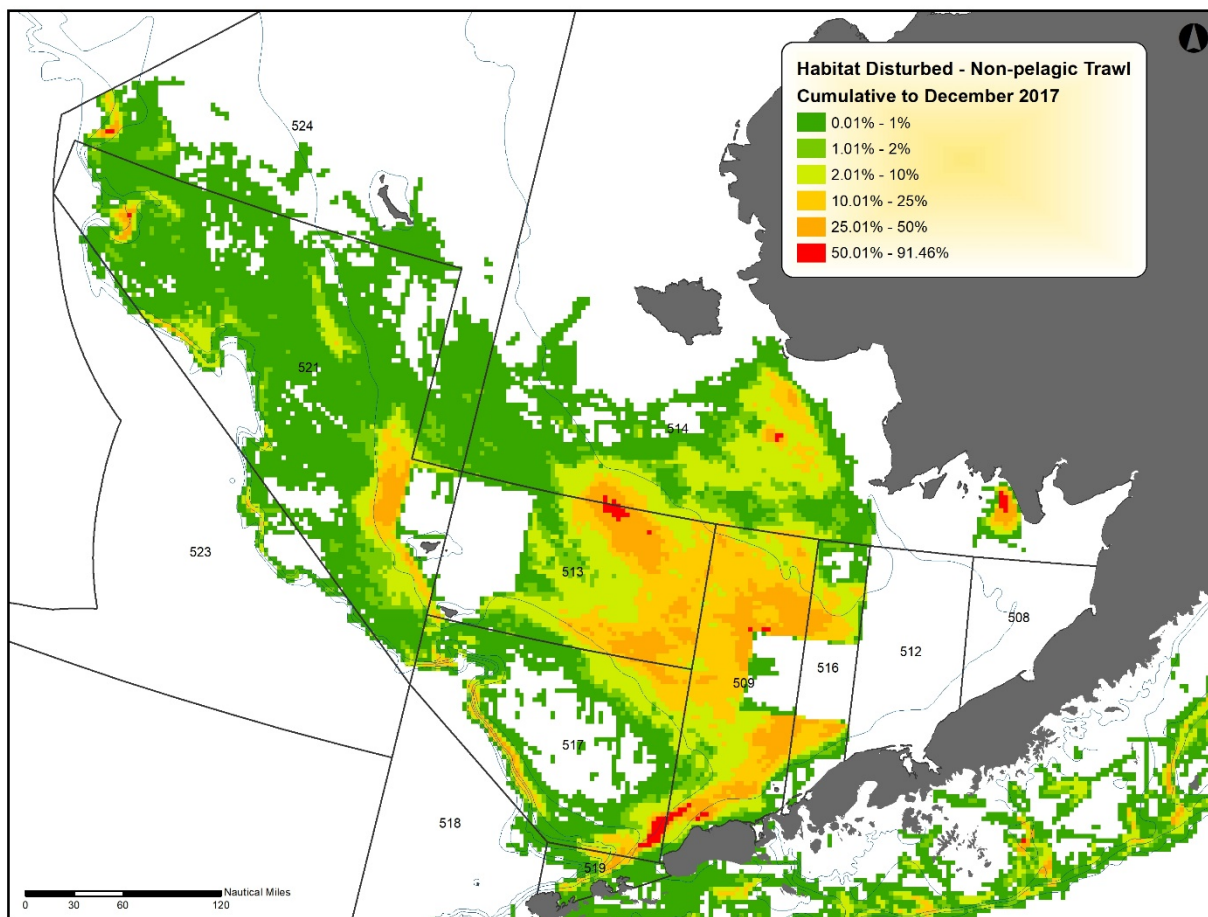
The BSAI and GOA are extremely large areas, making comprehensive habitat mapping difficult. Habitat has been mapped at a level of 5 km<sup>2</sup> grids, and while this level is likely under sampling habitat, the data provide an idea of what is occurring on the seafloor (Figure 18). Figures 19-21 show the percent of area within each grid cell that has been disturbed (2003-2017) for BS, AI, and GOA, respectively. While fishing effort maps overlapping with habitat types do not exist, one can do a side-by-side comparison of Figure 18 and Figures 19-21 to get an idea of which habitats are more likely to be encountered by the UoAs. Figure 18 shows a high occurrence of mud and sand and lesser amounts

of gravel, cobble, and boulders, but the target species are known to associate with the latter types. Therefore, for assessment purposes, the following habitat types will be considered commonly encountered habitats for these UoAs:

- Soft bottom – fine substratum (i.e., mud and sand), flat geomorphology, no flora or fauna biota
- Mixed bottom – medium substratum (i.e., gravel), low relief geomorphology, no flora and small erect fauna biota
- Hard bottom – large substratum (i.e., cobble and boulders), outcrop and high relief geomorphology, large erect and small erect biota

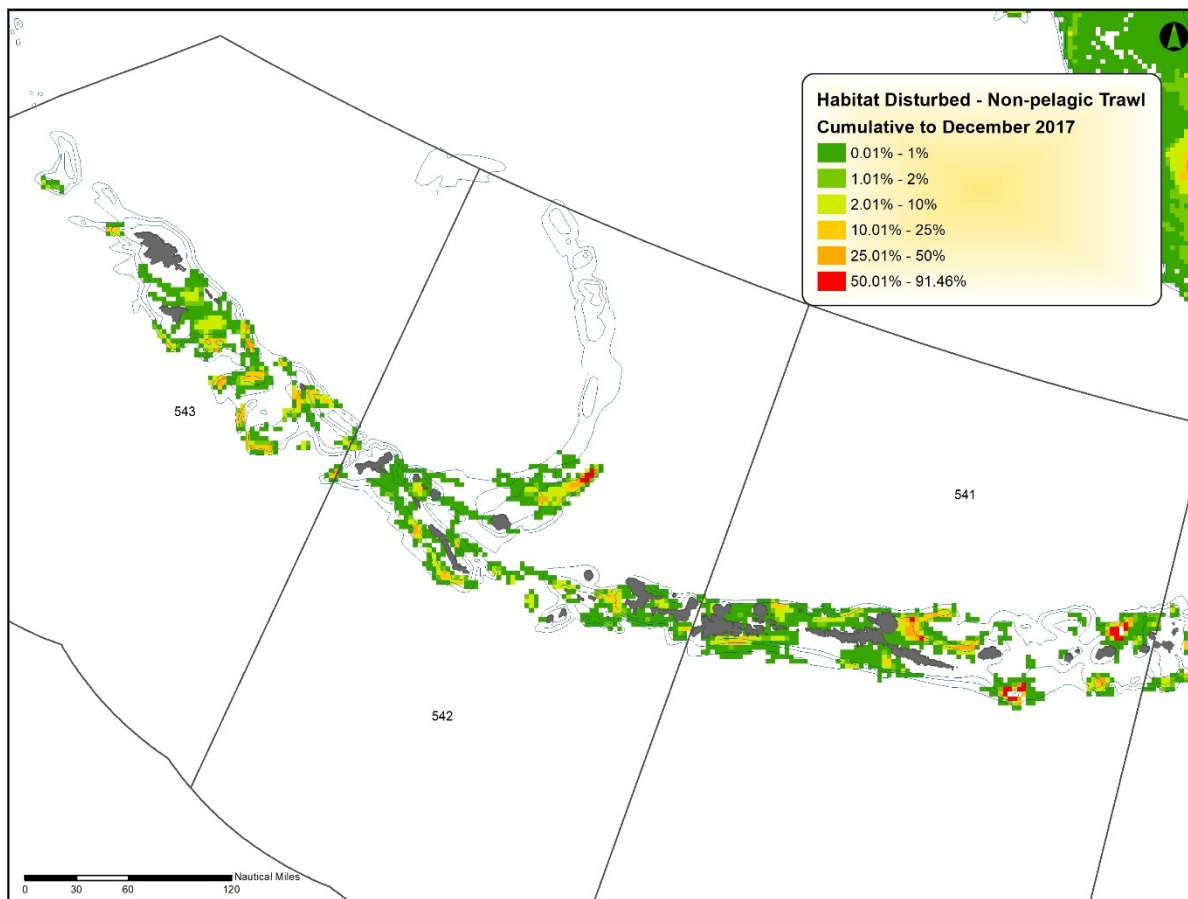


**Figure 18. Habitat maps showing the probability of occurrence of the predominant habitat types in the BSAI and GOA. Source: NOAA**

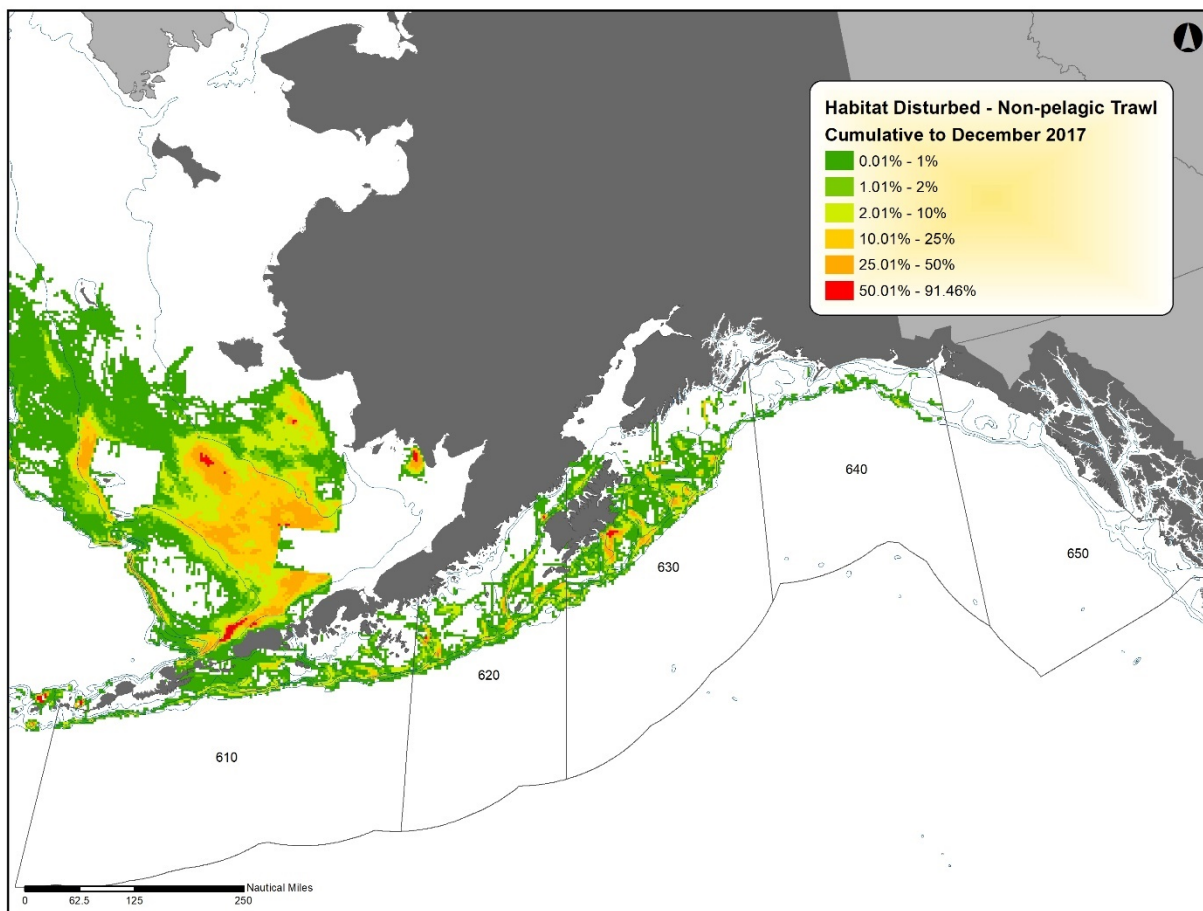


**Figure 19. Percent of area disturbed, 2003-2017, by bottom trawl gear in the BS. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA**





**Figure 20. Percent of area disturbed, 2003-2017, by bottom trawl gear in the AI. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA**



**Figure 21. Percent of area disturbed, 2003-2017, by bottom trawl gear in the GOA. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA**

For Figures 19-21, it should be noted that this is the maximum potential overlap (based on 1 hectare grids) and does not include the UoAs' gear-contact modifications. The UoAs have spatially explicit vessel monitoring system (VMS) data, which pings every five minutes, show that the UoAs fish the same areas over and over (John Olson, pers. comm.).

## BS

The EBS seafloor is a mixture of mud (clay and silt), sand, and gravel with sand and silt being the primary components over most of the seafloor. Sand dominates in waters <60 m deep. The proportions of finer-grade sediments increase with increasing depth and distance from shore. This grading is most noticeable on the southeastern BS continental shelf in Bristol Bay and immediately westward. Generally, nearshore sediments in the east and southeast on the inner shelf (0-50 m depth) are sandy gravel and gravelly sand, giving way to plain sand farther offshore and west. On the middle shelf (50-100 m), sand transitions to muddy sand and sandy mud, continuing over much of the outer shelf (100-200 m) to the start of the continental slope. On the central and northeastern shelf (including Norton Sound), sediment has not been as extensively mapped, and although sand appears dominant, there are areas of silt concentration in shallow nearshore waters and in deep areas near the shelf slope due to the large input of fluvial silt from the Yukon River and northerly current (NPFMC 2018a).

## AI

The AI is the tip of a submerged volcanic mountain chain that stretches about 2,260 km forming a partial geographic barrier to the exchange of northern Pacific marine waters with EBS waters. The AI continental shelf is narrow compared with the EBS shelf, ranging in width from about 4 km or less to 42-46 km north to south. The shelf broadens on the eastern portion of the AI arc. Bathymetry changes dramatically over short distance, from the depths of the Aleutian Trench (>7,000 m deep) to sea level. Unlike the soft bottom sediments of the BS, bottom habitats are highly



complex, with primarily rough, rocky bottom (rock, boulders, and corals) steep slopes and drop-offs, and few areas of fine sediments. Two distinct bottom-type zones are evident. East of Samalga Pass, the AI rises from shallow continental shelf covered by glacial deposits, whereas west of Samalga, steep rocky slopes to the north and south surround a mostly submerged mountain range resting on the Aleutian ridge (NPFMC 2018a).

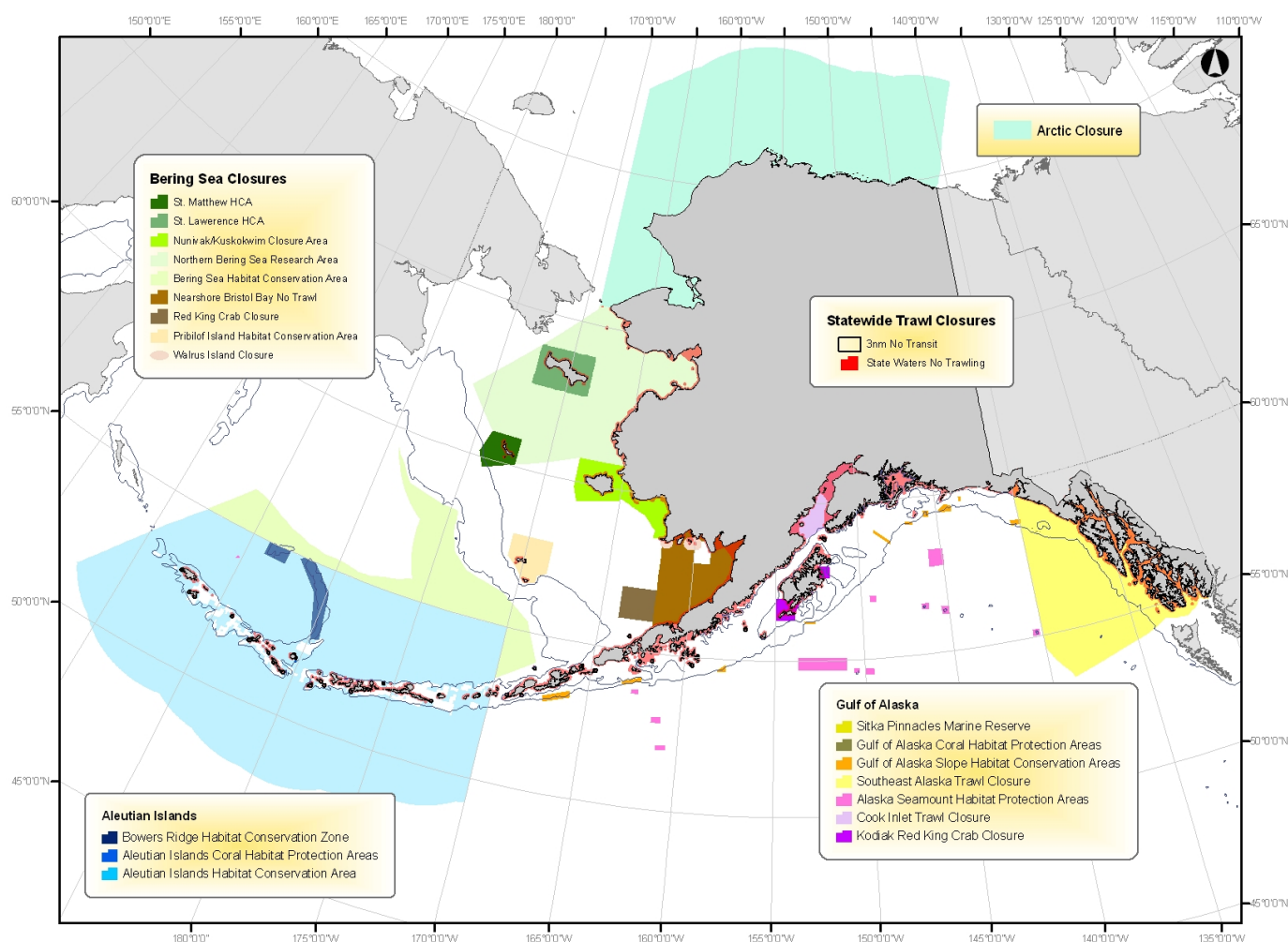
As part of the Alaska Initiative (discussed in more detail below), new bathymetry and sediment maps were completed for the AI and GOA. Future work will expand geological interpretation of these maps and data to provide substrate-based classifications for regions where enough supporting data exists (Rooper et al. 2017). This type of information will be useful for determining with more accuracy which habitats are impacted and the level of such impact.

## GOA

The GOA seafloor includes gravel, silty mud, and muddy to sandy gravel, as well as areas of boulders and hardrock. The shelf, between Cape Clear (148° W) and Cape Fairweather (138° W), is relatively wide (up to 100 km). The dominant shelf sediment is clay silt, which comes primarily from either the Copper River or the Bering and Malaspina glaciers. Sand dominates the nearshore areas. Most of the western GOA shelf (west of Cape Igvak) consist of steep and sharply dissected slopes. The shelf is made up of several banks and reefs with coarse rocky bottoms and patchy bottom sediments. Near Kodiak Island, the shelf is flat with relatively shallow banks cut by transverse troughs of bedrock outcrops and coarsely fragmented sediment interspersed with sandy bottoms (NPFMC 2018b).

### 5.3.5.2 VMEs

NMFS and the Council recognize that habitat is essential for maintaining productivity of fishery resources. Because fishing gear has the potential to disturb habitat, regulations have been implemented to protect areas that could be irreversibly damaged by fishing. Large areas of the North Pacific have been permanently closed to groundfish trawling to reduce potential adverse impacts on sensitive habitat and to protect benthic invertebrates (Figure 22). Fishery closures established in nearshore areas to reduce interactions with Steller sea lions may also have ancillary benefits of reducing habitat impacts (see above; NPFMC 2018a, 2018b). In total, nearly 65% of the Alaskan U.S. is closed to bottom trawling (Siddon and Zador 2018). For this assessment, the VMEs in the BSAI and GOA are the designated essential fish habitats (EFHs), habitat areas of particular concern (HAPCs), and other closed and protected areas; red tree corals (*Primnoa pacifica*); and sea pens and sea whips. Each of these is discussed in more detail below.



**Figure 22. Closed areas in the BSAI and GOA. Source: <https://www.npfmc.org/habitat-protections/>**

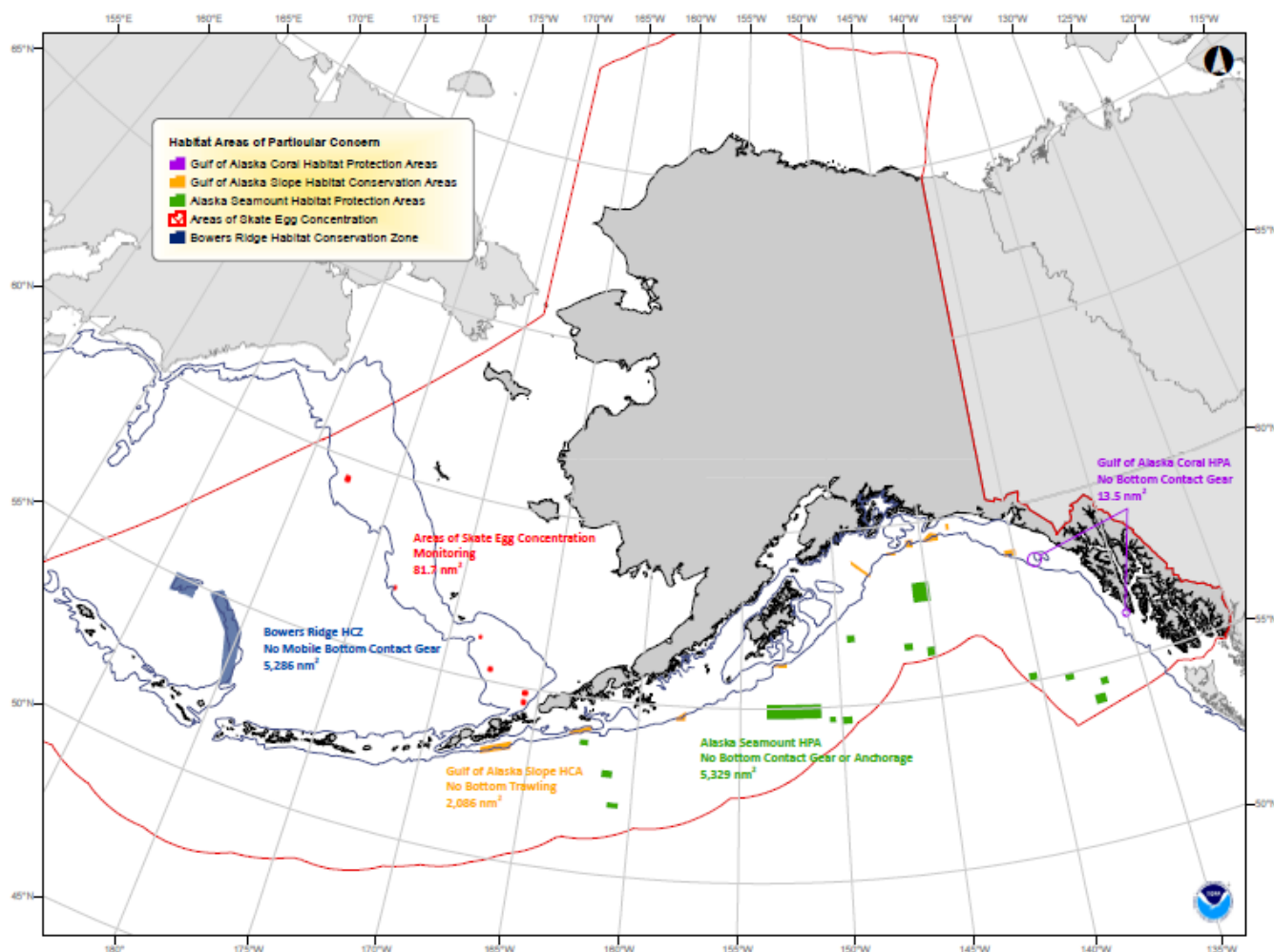
### ***EFHs, HAPCs, and other closed and protected areas***

MSFCMA requires Councils to identify EFHs for all fisheries and to “prevent, mitigate or minimize, to the extent practicable” any adverse effects of fishing on EFH that are “more than minimal and not temporary”. In 2005, NMFS published the final EIS for EFH in Alaska, identifying EFH for fisheries managed by the Council, recommending an approach to identify HAPCs, and specifying an objective to minimize to the extent practicably possible the adverse effects of fishing on EFH (NMFS 2005). Each Council FMP contains provisions for a review of EFH issues and relevant models every five years. The latest review was carried out in 2015. EFH information is also reviewed annually in the “Ecosystem Considerations” section of SAFE reports.

The latest EFH review developed a hierarchical impact assessment methodology to operationalize the “more than minimal and not temporary” criterion (Simpson et al. 2017). As part of the 2015 EFH review, the Fishing Effects (FE) model was developed using vessel-monitoring data and improving upon the previously used model (i.e., Long-Term Effect Index). The FE model considers “EFH and impacts to EFH in a holistic manner, rather than separately identifying impacts to EFH designated for individual species and life stages” (Simpson et al. 2017), which is consistent with the EFH final rule that indicates “adverse effects to EFH may result from actions occurring within EFH or outside of [designated] EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions” (§600.810). Unlike the Long-Term Effect Index, the FE model defines 27 habitat features, which were pulled from an extensive literature review, can be grouped biologically or geologically (Simpson et al. 2017).

HAPCs are designated following a nomination process according to the Council priorities. HAPC nominations are generally on a five-year cycle but may be initiated at any time. Previous priorities have been seamounts and undisturbed coral areas; the last process was carried out according to a priority of identifying skate nursery areas. The SAFE reports also include specific indicators of vulnerable habitat (e.g., corals, sponges, sea whips) for which trends are monitored and appropriate mitigation may be implemented as necessary. Figure 23 shows the following HAPCs that have been designated in the BSAI and GOA management areas:

1. Bowers Ridge Habitat Conservation Zone (Bowers Ridge and Ulm Plateau; bottom contact gear prohibited)
2. Alaska Seamount Habitat Protection Area (mobile bottom contact gear prohibited)
3. GOA Coral Habitat Protection Areas (bottom contact gear prohibited)
4. GOA Slope Habitat Conservation Areas (non-pelagic trawl gear prohibited)
5. Skate egg concentration areas (monitoring priority)



**Figure 23. HAPCs within the BSAI and GOA. Source: <https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska>**

## Corals

In addition to the closed and protected areas already mentioned, there are the AI Coral Habitat Protection Areas where contact with the bottom is not permitted (Figure 22). NOAA's Deep-Sea Coral Research and Technology Program funded research in Alaska to examine the location, distribution, ecosystem role, and status of deep-sea coral and sponge habitats to identify additional areas with may need protection. Rooper et al. (2017) presents the results of 15 projects, collectively known as the Alaska Initiative, which was a three-year initiative that provided new information for addressing short-term management needs for coral and sponge ecosystems (e.g., distribution mapping, modeling) and longer-term goals (e.g., establishing monitoring stations). The projects looking at *P. pacifica* and associated species in the eastern GOA confirmed, among other things, that the coral habitat extends beyond the current HAPC closed areas and that damage likely from longline fishing to the corals outside the closed areas has occurred. The Alaska Initiative has also led to the production of maps predicting coral and sponge occurrence on a one-hectare scale for three of the four Alaskan large marine ecosystems.

The Alaska Initiative identified several priorities for future research. The following priorities are relevant to this assessment:

- *Towed stereo camera survey based on stratified random sampling design in the Gulf of Alaska to validate coral and sponge distribution models based on bottom trawl survey data.*
- *Assessment of the effectiveness of current fishing closures and potential pathways forward with spatial management of coral and sponge ecosystems using a combination of spatial analysis*

*tools (such as Zonation) and fieldwork that revisits previous sites to assess recovery from fishing impacts.*

- *Population assessment for major coral species in each region that integrates existing life history information and distribution information to estimate sustainable mortality rates (bycatch rates) ...*
- *...Construction/revision of potential marine benthic habitat maps to represent the substrate types found with corals and sponges. This would entail sampling at coral and sponges collection sites and modifying our habitat characterization to include in situ observations. There could also be a follow-up sampling program based on predictive models developed from this assessment.*

Source: Rooper et al. 2017

### **Sea pens and sea whips**

Sea pens and whips as well as corals, anemones, and sponges make up the classification of “structural epifauna” (Siddon and Zador 2018, Zador and Ortiz 2018, Zador and Yasumiishi 2018). The catch of structural epifauna has been variable in the AI and GOA and steady in the EBS from 2011-2017. Sea pens and whips are more likely to be encountered in the southern BS and eastern AI. Overall, the catch of structural epifauna is very low compared with the catch of target species for these UoAs.

### **BSAI**

In the last 15 years, the Council has enacted several measures to protect habitats and VMEs in the BSAI. In the AI in February 2005, the Council adopted several new closure areas to conserve EFH. The Council prohibited all bottom trawling in the AI, except in small discrete “open” areas, to minimize the effects of fishing on EFH and to address impacts of bottom trawling on benthic habitat (e.g., corals). Over 95% of the AI management area is now closed to bottom trawling (277,100 nm<sup>2</sup>). Six habitat conservation zones with high-density coral and sponge habitat were also closed to all bottom-contact fishing gear in the AI (Figure 22). To improve monitoring and enforcement of the AI closures, VMS is required to be used on all fishing vessels in the AI management area (NPFMC 2019a).

At the same time, the Council also adopted several new HAPCs (Figure 23). The Alaska Seamount Habitat Protection Area encompasses all 16 seamounts in federal waters off Alaska, and bottom-contact fishing is prohibited in this HAPC. The AI’s Coral Habitat Protection Areas include six areas where a high density of coral is known to exist. All bottom-contact gear is prohibited in these areas. Lastly, the relatively unexplored Bowers Ridge was also identified as a HAPC, and as a precautionary measure, the Council prohibited mobile, bottom fishing gear within this 5,286 nm<sup>2</sup> area (NPFMC 2019a). Refer to Figure 22.

In an effort to conserve benthic fish habitat in the BS, the Council adopted precautionary measures in June 2007 to freeze the bottom trawling footprint, limiting trawl effort to the more recently trawled areas. Implemented in 2008, the measures prohibit bottom trawling in a deep slope and basin area (47,000 nm<sup>2</sup>) and three habitat conservation areas around St. Matthew Island, St. Lawrence Island, and an area encompassing Nunivak Island-Etolin Strait-Kuskokwim Bay. In 2008, the Council also established the Northern Bering Sea Research Area that includes the shelf waters to the north of St. Matthew Island (85,000 nm<sup>2</sup>) and is closed to bottom trawling (Figure 22).

In 2006-2007, the Council requested information from the AFSC on the Pribilof, Pervenets, and Zhemchug canyons for consideration as HAPC designation. The Council subsequently postponed taking action since scientific information was not available to establish the dependence of managed species on habitat features of the canyons. The Council then received proposals to preserve the Pribilof and Zhemchug canyons as candidates for management measures to provide EFH protection for deep-sea corals, sponges, and other benthic habitat important to FMP-managed species. In 2013, the Council reviewed new information from the AFSC to evaluate further whether and how to protect deep-sea coral in the Pribilof Canyon (NPFMC 2019b). The April 2014 motion acknowledged the need to determine whether and how the Council should recommend amendment of the BSAI Groundfish FMP to protect known, significant concentrations of deep-sea corals in the Pribilof Canyon and the adjacent slope from fishing impacts under the appropriate authorities of the MSFCMA. Consistent with the Council’s adopted policy for incorporating the ecosystem approach to fisheries management and the authorities of the MSFCMA, the Council initiated action to investigate where and how to protect coral in these areas.

According to an October 2015 motion, “scientific evidence does not suggest there is a risk to the deep-sea corals present in the Pribilof and Zhemchug canyons and adjacent slope areas under current management. This conclusion is based on both the coral abundance model developed by NMFS and the recent stereo camera survey. The evidence shows low occurrence and density of deep-sea corals, lack of substrate to support corals, and low vulnerability of existing deep-sea corals in these areas to fishery impacts.” This motion was issued following the review of survey data presented in Rooper et al. (2015).

### **GOA**

The Council has also enacted several measures to protect habitats and VMEs in the GOA in the last 15 years. In February 2005, bottom trawling was prohibited in 10 designated areas along the continental shelf of the GOA (Figures 22 and 23). The GOA Slope Habitat Conservation Areas, which are thought to contain high-relief bottom and coral communities, total 2,086 nm<sup>2</sup>. Additionally, the Council adopted several new HAPCs. The Alaska Seamount Habitat Protection Area encompasses all 16 seamounts in federal waters off Alaska, 15 of which are in the GOA. Bottom-contact fishing is prohibited in all of these HAPCs, which total 5,329 nm<sup>2</sup> (NPFMC 2019a). In Southeast Alaska, three sites with large aggregations of *P. pacifica* coral are also identified as HAPCs and total 67 nm<sup>2</sup>. The GOA Coral Habitat Protection Area designates five zones within these sites where are known to exist. All bottom-contact gear is prohibited in this area, which totals 13.5 nm<sup>2</sup> (NPFMC 2019a). Refer to Figure 22.

### **BSAI and GOA**

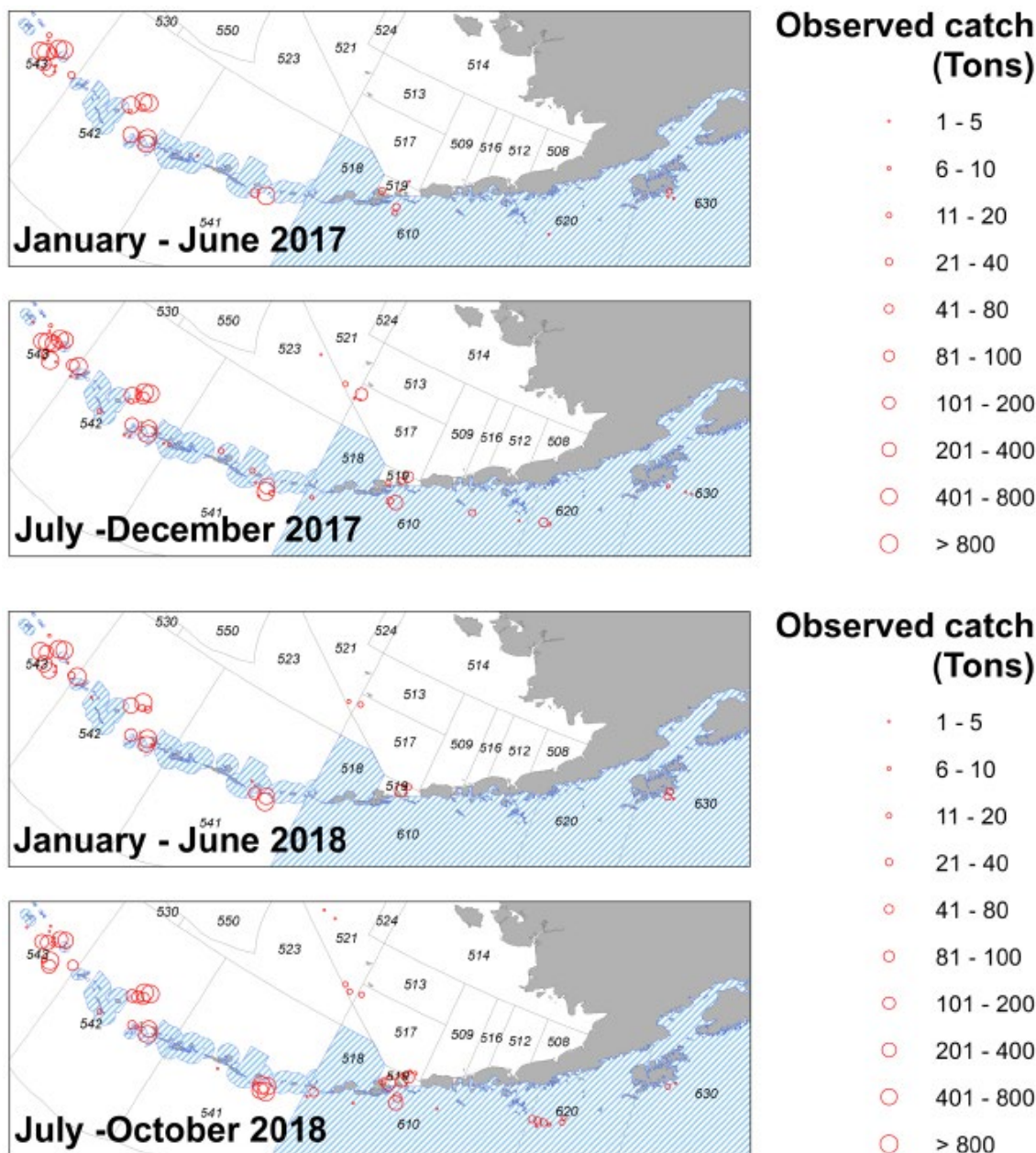
An update to EFH in 2017 incorporated model-based definitions and maps for the BSAI and GOA FMPs and incorporated results from the FE model to assess the impacts of commercial fishing on EFHs (NPFMC 2019c). These new models make use of new data available since the last EFH review in 2010. The next review is scheduled for 2022. Additionally, trawl sweep gear modification has been required by the Council for all trawl flatfish fisheries in the BS and central GOA. This gear has elevating devices (e.g., discs or bobbins), which are required for use on trawl sweeps, to raise the sweeps off the seabed and limit trawling impact on the seafloor. Research has shown that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab (NPFMC 2019d).

#### **5.3.5.3 UoA 1 – BSAI Atka mackerel**

Atka mackerel is a semi-demersal, schooling species that is distributed from Japan and the east coast of the Kamchatka Peninsula, Russia, throughout the Komandorskiye and AI, north to the Pribilof Islands, and eastward through the GOA to Southeast Alaska. They are most abundant along the AI, particularly from Buldir Island to Seguam Pass. Nearer to Alaska, Atka mackerel schools are found along the outer continental shelf and upper slope region from 100-300 m. Based on data from underwater camera tows, they prefer coarse-grained and rocky bottom habitats (Lowe et al. 2018). Atka mackerel colonies are widespread across the continental shelf of the BSAI and western GOA in areas with strong currents and at bottom depths of 144 m (Lauth et al. 2007).

While a habitat map overlapped with fishing effort is not available, “observed fishing effort is used as an indicator of total fishing effort (Olson 2015), and can be used as an indicator of potential habitat disturbance” (Lowe et al. 2018). Figure 24 shows the observed catch for BSAI Atka mackerel. These data along with that presented in Figures 18-21 provide a sufficient level of detail to determine the UoA’s level of impact. Additionally, based on Table 12, about 15 benthic species or species groups are taken as bycatch in this UoA, but each of these accounts for 0.16% or usually much less.

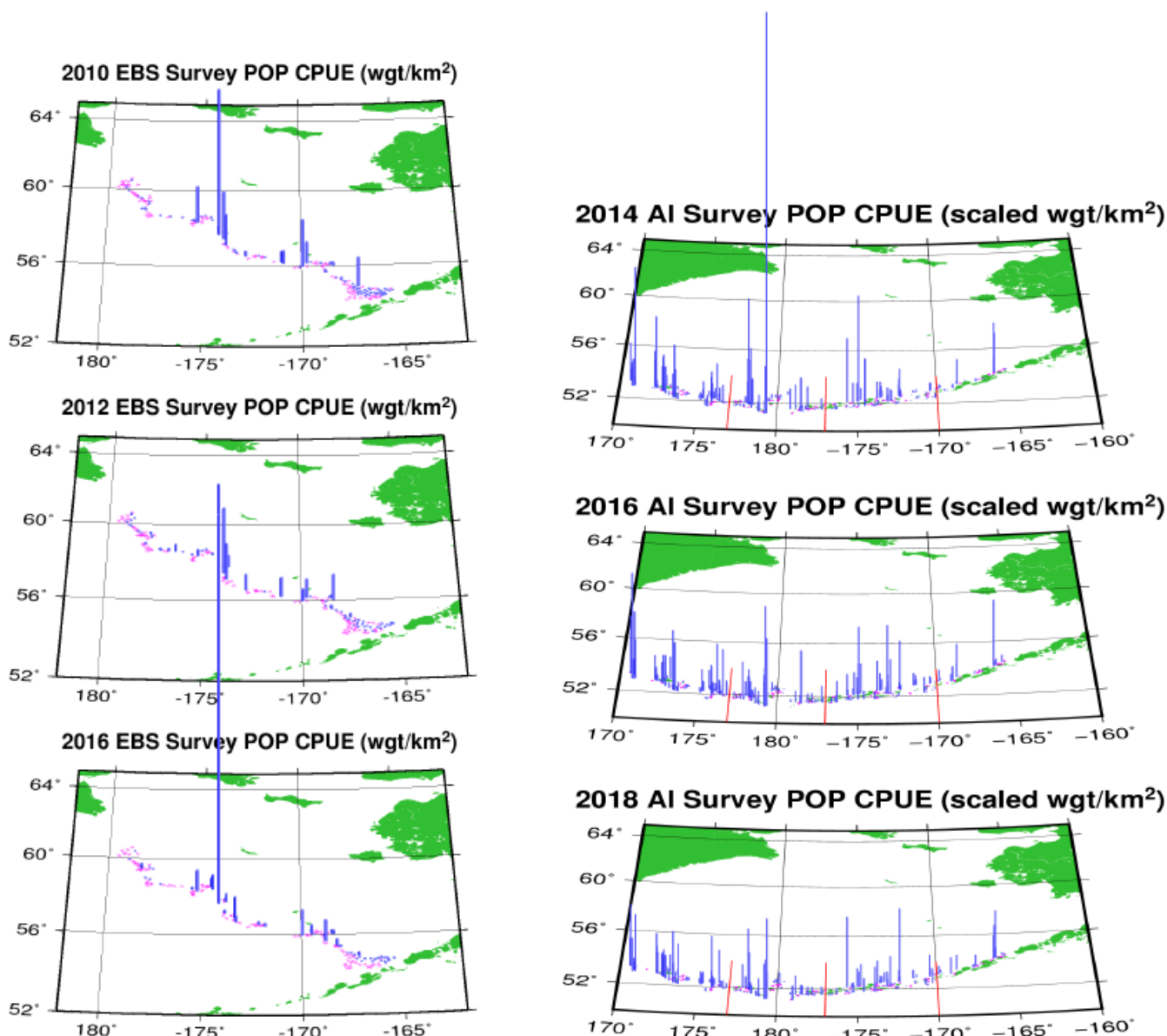




**Figure 24. Observed catches (summed for 20 km<sup>2</sup> cells) for 2017-2018 for Atka mackerel where catch per haul was >1 t. (Shaded areas represent areas closed to directed Atka mackerel fishing.) Source: Lowe et al. 2018**

#### 5.3.5.4 UoAs 2 and 3 – BSAI Pacific Ocean perch and northern rockfish

Pacific Ocean perch are distributed from northern California through the GOA to the BSAI and west to Japan. Juvenile Pacific Ocean perch are found in shallower inshore waters at depths around 40m where they feed on copepods (Love et al. 2002). Adult Pacific Ocean perch live in very deep waters (~100-800 m). Juveniles are believed to prefer untrawlable habitat (i.e., boulder fields and rocky pinnacles) whereas adults are found in less rough habitat (Spencer and Ianelli 2018). There are significant differences in seasonal depth distributions of Pacific Ocean perch (Love et al. 2002). In the summer, the adults are found in shallower depths (~150-300m), and in the fall, the fish are found further offshore in depths of ~300-400m. It is believed that these seasonal differences are related to feeding patterns in the summer and spawning in the winter. Figure 25 shows the biomass distribution within the BSAI for Pacific Ocean perch. As with Atka mackerel, a habitat map overlapped with fishing effort is not available so the species' spatial distribution is used as an indicator of total fishing effort and potential habitat disturbance.



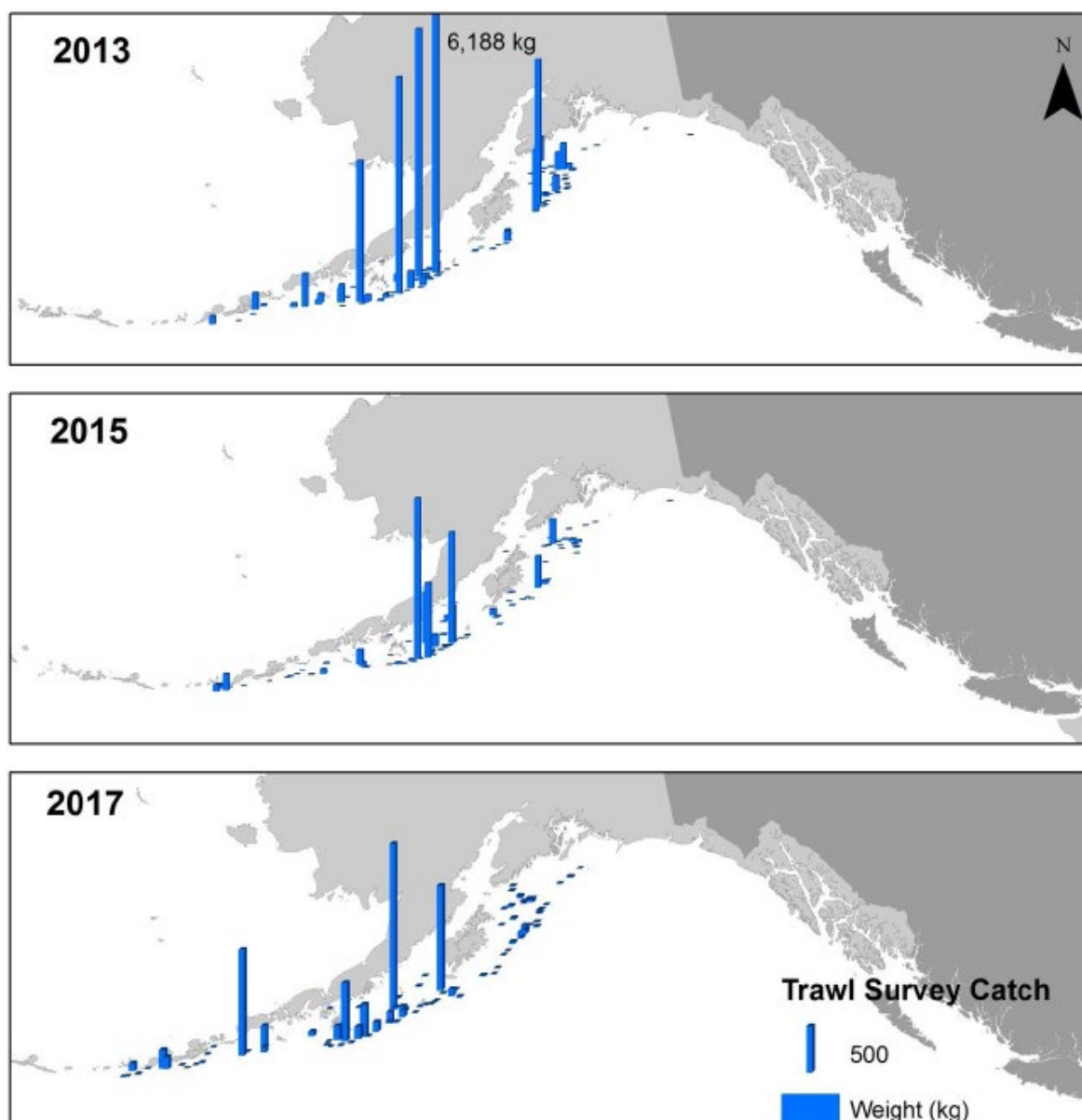
**Figure 25. Spatial distribution of BSAI Pacific Ocean perch during slope surveys for EBS (left) and AI (right) in 2010, 2012, and 2016. (For the AI graphs, the red lines indicate boundaries between the western AI, central AI, eastern AI, and EBS areas.) Source: Spencer and Ianelli 2018**

Northern rockfish range from the northernmost extent of British Columbia north throughout the BS and east to the Kamchatka Peninsula. This is one of the most northerly distributions of any of the more than 60 species of *Sebastes* in the North Pacific. While no distribution map is available for BSAI northern rockfish, it can be inferred that they are caught in similar areas as Pacific Ocean perch since the two species are harvested together. Figure 25 along with the data presented in Figures 18-21 provide a sufficient level of detail to determine the UoAs' level of impact. Additionally, based on Table 13, about 15 benthic species or species groups are taken as bycatch by these UoAs, but each of these accounts for 0.29% or usually much less.

#### 5.3.5.5 UoAs 4, 5, and 6 – GOA northern rockfish, Pacific Ocean perch, and dusky rockfish

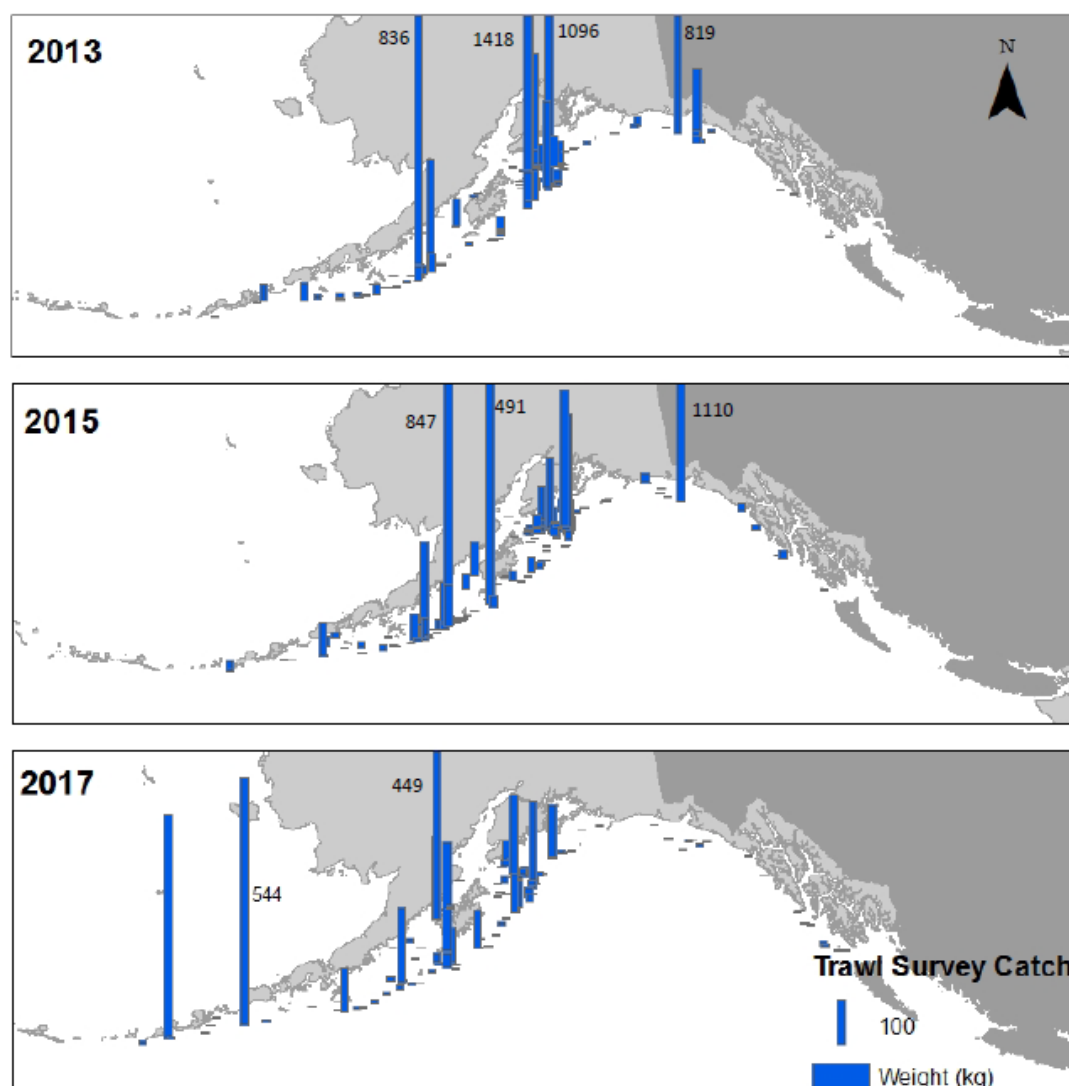
"Trawl surveys and commercial fishing data indicate that the preferred habitat of adult northern rockfish in the [GOA] is relatively shallow rises or banks on the outer continental shelf at depths of about 75-150 m (Clausen and Heifetz 2002). The highest concentrations of northern rockfish from NMFS trawl survey catches appear to be associated with relatively rough (variously defined as hard, steep, rocky or uneven) bottom on these banks (Clausen and Heifetz 2002)" (Cunningham et al. 2018). Dusky rockfish range from southern British Columbia, north into the BS, and west to Hokkaido Island. However, they are really only abundant in the GOA (Fenske et al. 2018). Adult dusky rockfish amass on the outer continental shelf's offshore banks at depths of 100-200 m (Reuter 1999). The preferred habitat of adults is believed to be rocky areas (Fenske et al. 2018).

Figures 26 and 27 show biomass distribution within the GOA for northern rockfish and dusky rockfish, respectively. Note that no such graph is available for GOA Pacific Ocean perch. However, “dusky rockfish often co-occur and are caught with northern rockfish in the commercial fishery and in trawl surveys (Reuter 1999) and catches of northern rockfish have been associated with a rocky or rough bottom habitat (Clausen and Heifetz 2002)” (Cunningham et al. 2018). As with the other UoAs, a habitat map overlapped with fishing effort is not available so the species’ spatial distributions are used as an indicator of total fishing effort and potential habitat disturbance. The data in Figures 26 and 27 along with that presented in Figures 18 and 21 provide a sufficient level of detail to determine the UoAs’ level of impact. Additionally, based on Table 14, about 10 benthic species or species groups are taken as bycatch by these UoAs, but each of these accounts for 0.02% or less.



**Figure 26. Spatial distribution of GOA northern rockfish during NMFS trawl surveys in 2013, 2015, and 2017.**  
Source: Cunningham et al. 2018

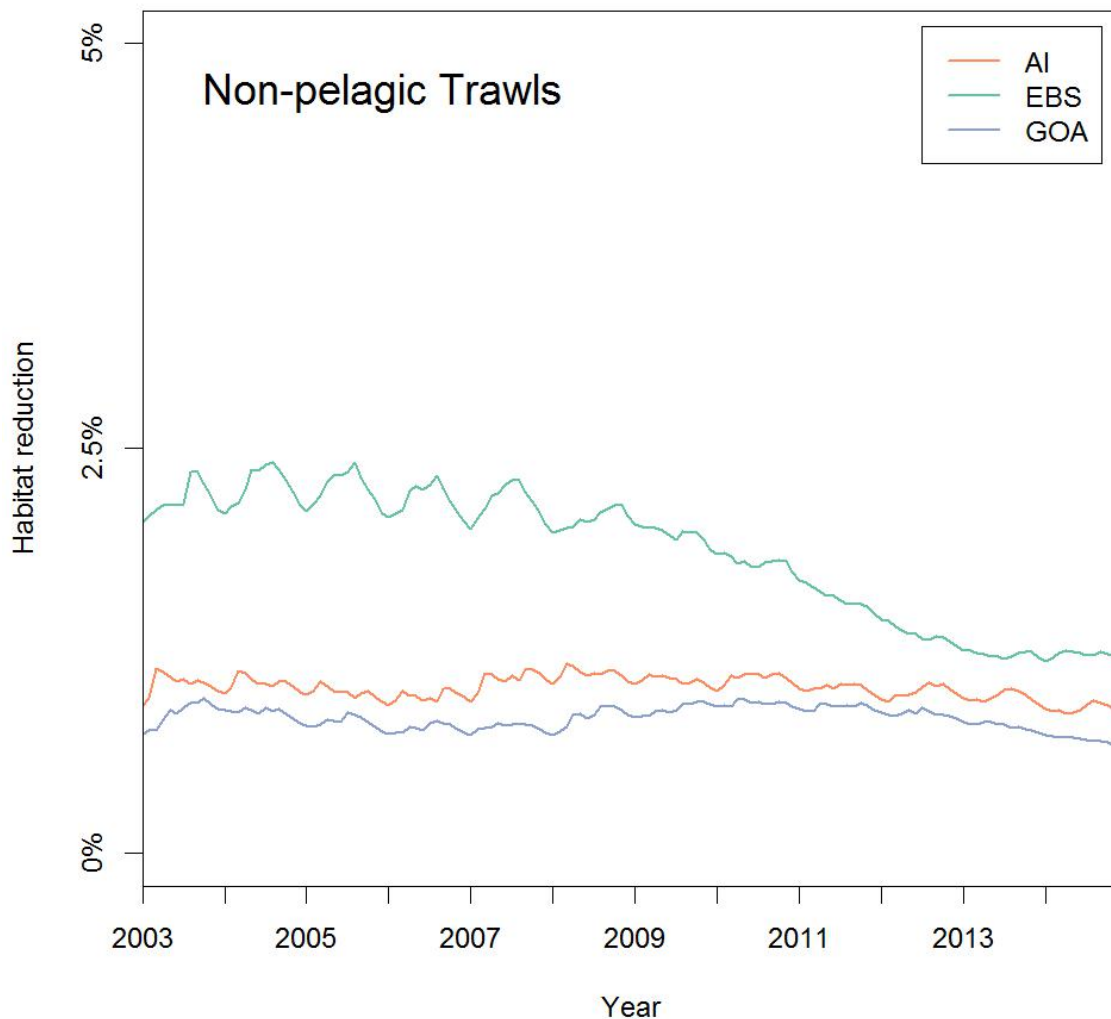




**Figure 27. Spatial distribution of GOA dusky rockfish during NMFS trawl surveys in 2013, 2015, and 2017.**  
**Source: Fenske et al. 2018**

#### 5.3.5.6 Habitat reduction and recovery

“Various studies (e.g., Collie et al. 2000, Hiddink et al. 2006, Kaiser et al. 2006) show that recovery rates are slowest within stable, muddy or structurally complex habitats when compared to sandy sediment communities that show little change after two to three bottom trawl passes a year. Less abundant, more vulnerable long-lived species are likely to recover more slowly. It can take an organism anywhere from a few months to many decades to recover (Hutchings 2000, Kaiser et al. 2006, Hill et al. 2011)” (MSC in prep). Habitat reduction plots in the BSAI and GOA for these UoAs show relatively little habitat impact over the last 10-15 years, and in some case, the impact has been reduced due to gear modifications (e.g., sweep modifications) (Figure 28). As noted above, the UoAs’ spatially explicit VMS data show that they fish in the same areas over and over. Observer data for the AI UoAs show that they have continued to have some level of coral bycatch over the last 20 years. This likely means that, instead of being completely removed by the UoAs, corals (and likely other benthic habitats) continue to exist and/or are continuously recovering (John Olson, pers. comm.).



**Figure 28. Habitat reduction (2003-2015) from non-pelagic trawls in the EBS, AI, and GOA. Source: NOAA**

#### 5.3.5.7 Cumulative habitat management

The MSC Fisheries Certification Requirements (MSC 2014) require cumulative management of VMEs. That is, these UoAs need to consider what other MSC UoAs as well as non-MSC fisheries have done to protect VMEs. These UoAs need to comply with its management requirements as well as protection measures put in place by other MSC UoAs/non-MSC fisheries. Since the other MSC UoAs and non-MSC fisheries are all under the same management as these UoAs, they are all following the closed area requirements.

#### 5.3.6 Ecosystem

The Council has been committed to the development and implementation of ecosystem-based fisheries management (EBFM) for some time. The principles and goals of EBFM are described in the BSAI FMP (NPFMC 2018a) and the GOA FMP (NPFMC 2018b). The Council's Ecosystem Committee provides advice to the Council on North Pacific ecosystem issues, considers management measures in the light of national ecosystem discussions, and suggests how the Council can engage in EBFM. Some of the Council's recent EBFM-related actions include the development of the BS and AI Fishery Ecosystem Plans (FEPs) (NPFMC 2007, 2019e). The FEPs are strategic policy and planning documents that can provide the Council with both an "early warning system" and an ecosystem context for fishery management decisions affecting the BSAI area. The assessment team does not know of a plan to develop a GOA FEP. The Council also convened an Ecosystem Research Workshop in February 2018 to engage stakeholders in a discussion on how best to incorporate new ecosystem knowledge into the Council's processes and produces annual Ecosystem Status Reports for the EBS, AI, and GOA (Siddon and Zador 2018, Zador and Ortiz 2018, Zador and

Yasumiishi 2018). These reports compile and summarize ecosystem status information and include status report cards, integrated ecosystem assessments, and EBFM indicators that provide a context for EBFM decisions.

The relationships among populations in the ecosystem has been extensively examined through a variety of ecosystem and multi-species models. Several models to describe and understand the structure and functioning of the BSAI and GOA ecosystems have also been developed (Aydin and Meuter 2007; Aydin et al. 2007; Gaichas and Francis 2008; Gaichas et al. 2011, 2012). Food web modelling using Ecopath/Ecosim has been carried out for EBS, AI, and GOA, which provides predominantly guild-level analyses of cumulative and ecosystem-level indicators. The use of ecosystem monitoring and modeling information is specifically required or requested by the Council, notably the use of ecosystem indicators in the SAFE process and ecosystem and multi-species models. This information provides a mechanism by which the role of the UoAs in the food web is assessed and monitored. For example, the UoAs' relative importance as a prey species is determined and evaluated. The UoAs are also monitored and managed in relation to marine mammal predators includes the setting of mortality limits and additional protection measures, such as fishery exclusion from EFHs.

Overall, the Council's approach to these UoAs explicitly includes EBFM principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. This includes the setting of outcome indicators relating to preserving the food web; managing incidental catch; and avoiding impacts on seabirds, mammals, and habitats.

### 5.3.7 Principle 2 scoring elements

Tables 12-14 provide catch data for the UoAs. Given that these are extensive lists, only the main species are repeated in Table 21. The ETP species from Table 16 are also listed in Table 21.

**Table 22. Scoring elements.**

UoA(s)	Component	Scoring elements	Designation	Data-deficient
All	Primary	None	Main	No
All	Secondary	Northern fulmar	Main	No
1, 2, 3	Secondary	Auklets (Crested, parakeet, and whiskered)	Main	No
1, 2, 3	Secondary	Shearwaters (short-tailed and sooty)	Main	No
1	Secondary	Fork-tailed storm petrels	Main	No
1	ETP	Leach's storm petrel	Main	No
1	ETP	Bearded seal	Main	No
2, 3	ETP	Killer whale (eastern North Pacific Alaska resident)	Main	No
2, 3	ETP	Killer whale (GOA, AI, and BS transient)	Main	No
1, 2, 3	ETP	Ribbon seal	Main	No
1, 4, 5, 6	ETP	Steller sea lion (western US stock)	Main	No
All	ETP	Bairdi tanner crab	Main	No
All	ETP	Blue king crab	Main	No
All	ETP	Chinook salmon	Main	No

All	ETP	Golden king crab	Main	No
All	ETP	Non-chinook salmon	Main	No
All	ETP	Opilio tanner crab	Main	No
All	ETP	Pacific halibut	Main	No
All	ETP	Pacific herring	Main	No
All	ETP	Red king crab	Main	No
2, 3	ETP	Laysan albatross	Main	No
All	Habitat	Soft bottom (mud and sand)	Main (commonly encountered)	No
All	Habitat	Mixed bottom (gravel)	Main (commonly encountered)	No
All	Habitat	Hard bottom (cobble and boulders)	Main (commonly encountered)	No
All	Habitat	Red tree corals	Main (VME)	No
All	Habitat	Sea pens and whips	Main (VME)	No
All	Habitat	EFHs, HAPCs, and other closed/protected areas	Main (VME)	No
BSAI	Ecosystem	BSAI	Main	No
GOA	Ecosystem	GOA	Main	No

### 5.3.8 Principle 2 Performance Indicator scores and rationales

#### PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Main primary species stock status			
	Guide post	<p>Main primary species are <b>likely</b> to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, the UoA has measures in place that are <b>expected</b> to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main primary species are <b>highly likely</b> to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, there is either <b>evidence of recovery</b> or a demonstrably effective strategy in place <b>between all MSC UoAs which categorise this species as main</b>, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a <b>high degree of certainty</b> that main primary species are above the PRI <b>and are</b> fluctuating around a level consistent with MSY.</p>
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – Yes
Rationale				

#### All UoAs

There are no main primary species for any of the UoAs; therefore, all UoAs meet the SG100.

<b>b</b>	Minor primary species stock status			
	Guide post			<p>Minor primary species are highly likely to be above the PRI.</p> <p>OR</p> <p>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.</p>
	Met?			All UoAs – No
Rationale				

#### All UoAs

It is not known whether or not all minor primary species are highly likely to be above PRI; therefore, none of the UoAs meet the SG100.

#### References

None

**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	All UoAs – 90
Condition number (if relevant)	

## PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place			
	Guide post	There are <b>measures</b> in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a <b>partial strategy</b> in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a <b>strategy</b> in place for the UoA for managing main and minor primary species.
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – No
Rationale				

All UoAs

There are no main primary species for any of the UoAs; therefore, measures and/or a partial strategy are not necessary. All UoAs meet the SG60 and SG80. While there are certainly strategies for managing some of the primary species, there are not strategies for all of the UoAs' main and minor primary species. The SG100 is not met.

Management strategy evaluation				
<b>b</b>	Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – Yes
Rationale				

All UoAs

There are no main primary species for any of the UoAs; therefore, measures and/or a partial strategy are not necessary. All UoAs meet the SG60, SG80, and SG100.

Management strategy implementation				
<b>c</b>	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its overall objective as set out in scoring issue (a)</b> .
	Met?		All UoAs – Yes	All UoAs – Yes
Rationale				

There are no main primary species for any of the UoAs; therefore, measures and/or a partial strategy are not necessary. All UoAs meet the SG80 and SG100.

Shark finning				
<b>d</b>	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
Rationale				

All UoAs

Shark finning in the United States has been prohibited since 2000. The Shark Finning Prohibition Act of 2000, which amended the MSFCMA, “prohibits any person under U.S. jurisdiction from engaging in the finning of sharks, possessing shark fins aboard a fishing vessel without the corresponding carcass, and landing shark fins without the corresponding carcass... The Shark Conservation Act required that all sharks in the United States, with one exception, be brought to shore with their fins naturally attached” (NMFS 2019a). (The exception pertains to those commercially fishing smooth dogfish.) With regard to these UoAs, sharks are not retained and are typically discarded whole. These vessels have two observers onboard at all times, and since there have been no enforcement violations, it can be concluded that shark finning is not occurring.

Review of alternative measures				
<b>e</b>	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

All UoAs

There are no main primary species; however, the UoAs have reviewed alternative measures to minimize unwanted catch, particularly with regard to salmon, halibut, and seabirds. Not all primary species have been considered on a biennial basis. Therefore, all UoAs meet SG60 and SG80 but not SG100.

## References

NMFS 2019a, <https://alaskafisheries.noaa.gov/fisheries/bycatch-reduction>

**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

## Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 95</b>
Condition number (if relevant)	



## PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main primary species with respect to status.  <b>OR</b>  <b>If RBF is used to score PI 2.1.1 for the UoA:</b> Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is <b>adequate to assess</b> the impact of the UoA on the main primary species with respect to status.  <b>OR</b>  <b>If RBF is used to score PI 2.1.1 for the UoA:</b> Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main primary species with respect to status.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
Rationale				

All UoAs

There are no main primary species for any of the UoAs; therefore, SG60, SG80, and SG100 are met.

<b>b</b>	Information adequacy for assessment of impact on minor primary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			<b>All UoAs – No</b>
Rationale				

All UoAs

While the UoAs' impact on all primary species is known (i.e., the catch data lists all species caught and the number/weight of each), there is not adequate information to know the UoAs' impact on the status of all primary species. Therefore, SG100 is not met.

<b>c</b>	Information adequacy for management strategy			
	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> primary species, and evaluate with a <b>high degree of certainty</b> whether the strategy is achieving its objective.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

#### All UoAs

Based on the catch data and observer coverage, there are no main primary species for any of the UoAs; therefore, the information is adequate to support the lack of a need for measures and/or a partial strategy. All UoAs meet the SG60 and SG80. While there are certainly strategies for managing some of the primary species, there is not adequate information to support the management of all of the UoAs' primary species. The SG100 is not met.

#### References

None

#### **Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 85</b>
Condition number (if relevant)	

## PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Main secondary species stock status			
	Guide post	<p>Main secondary species are <b>likely</b> to be above biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are <b>measures</b> in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are <b>highly likely</b> to be above biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there is either <b>evidence of recovery</b> or a <b>demonstrably effective partial strategy</b> in place such that the UoA does not hinder recovery and rebuilding.</p> <p>AND</p> <p>Where catches of a main secondary species outside of biological limits are <b>considerable</b>, there is either <b>evidence of recovery</b> or a, <b>demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species</b>, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a <b>high degree of certainty</b> that main secondary species are above biologically based limits.</p>
	Met?	<p><b>BSAI Atka mackerel – Yes</b>  <b>BSAI Pacific Ocean perch and BSAI northern rockfish – Yes</b>  <b>GOA UoAs – Yes</b></p>	<p><b>BSAI Atka mackerel – Yes</b>  <b>BSAI Pacific Ocean perch and BSAI northern rockfish – Yes</b>  <b>GOA UoAs – Yes</b></p>	<p><b>BSAI Atka mackerel – No</b>  <b>BSAI Pacific Ocean perch and BSAI northern rockfish – No</b>  <b>GOA UoAs – Yes</b></p>
Rationale				

Several seabirds are considered main secondary species for these UoAs. The species groups and the likely individual species encountered by the UoAs within the groups are as follows:

- Auklets – crested auklet, parakeet auklet, and whiskered auklet
- Shearwaters – short-tailed shearwater and sooty shearwater
- Storm petrels – fork-tailed storm petrel

The global population estimates for the main secondary species are as follows:

- Crested auklet – >8,200,000
- Parakeet auklet – >1,200,000
- Whiskered auklet – >100,000
- Northern fulmar – 1,400,000 (Alaska population only)
- Short-tailed and sooty shearwater – 43,000,000 (combined)
- Fork-tailed storm petrel – >6,000,000

#### BSAI Atka mackerel

This UoA's main secondary species are: auklets, northern fulmar, shearwaters, and fork-tailed storm petrel. The UoA caught 54 auklets in 2018 but none in 2014-2017, 221 northern fulmars in 2018 but none in 2016-2017, 139 shearwaters in 2018, and 197 storm petrels in 2018 but none in 2014-2017. (Due to species grouping, it is unknown how many of the storm petrels were fork-tailed, which is main secondary, or Leach's, which is ETP.) The team

acknowledges the sudden increases in 2018; however, the catch numbers are still relatively low so SG60 and SG80 are met. SG100 is not met since there is not a high degree of certainty because (1) several of these populations are declining due to other factors (e.g., predation by invasive species) and (2) there has been a recent uptick in bycatch of several of these species.

#### BSAI Pacific Ocean perch and BSAI northern rockfish

These UoAs' main secondary species are auklets, northern fulmar, and shearwaters. The UoAs caught 49 auklets in 2018 but none in 2014-2017, 0 northern fulmar in 2016-2018, and 772 shearwaters in 2017 but none in 2014-2016 or 2018. The team acknowledges the sudden recent increases for auklets and shearwaters; however, the catch numbers are still relatively low. Therefore, SG60 and SG80 are met. SG100 is not met since there is not a high degree of certainty because (1) several of these populations are declining due to other factors (e.g., predation by invasive species) and (2) there has been a recent uptick in bycatch of several of these species.

#### GOA UoAs

These UoAs' main secondary species is the northern fulmar. The UoAs caught 50 in 2018. Therefore, SG60 and SG80 are met. SG100 is also met since there is a high degree of certainty that the species is above biologically based limits.

Minor secondary species stock status				
<b>b</b>	Guide post			Minor secondary species are highly likely to be above biologically based limits.  OR  If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			<b>All UoAs – No</b>
Rationale				

#### All UoAs

It is not known whether or not all minor secondary species are highly likely to be above biologically based limits; therefore, none of the UoAs meet the SG100.

#### References

Brooke 2004; del Hoyo et al. 1996; Denlinger 2006; Eich et al. 2016, 2018; Krieger et al. 2019; Shannon Fitzgerald pers. comm.

#### **Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	<b>60-79</b>
Information gap indicator	<b>More information sought</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>BSAI UoAs – 80 GOA UoAs – 90</b>
Condition number (if relevant)	

## PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>partial strategy</b> in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>strategy</b> in place for the UoA for managing main and minor secondary species.
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – No
Rationale				

All UoAs

There are regulations and measures to reduce and/or avoid seabird bycatch. The regulations cover recordkeeping and reporting requirements; gear limitation; and specifications of seabird-avoidance gear for vessels based on the season, gear, and the type of gear used. These UoAs have 100% observer coverage, which is required by these regulations, to report (among other things) seabirds incidentally taken to the North Pacific Observer Program. This information is used not only to track the UoAs' impacts on the species but also to aid management measure discussions and decisions.

The Council develops its FMPs, which govern how the groundfish fisheries and the non-target species impacted by these fisheries are managed in the BSAI and GOA. As part of their FMPs, the Council continues to develop a suite of objectives to reduce bycatch and bycatch mortality in the groundfish fisheries, including:

- *Continue and improve current incidental catch and bycatch management program.*
- *Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.*
- *Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.*
- *Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.*
- *Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.*
- *Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and noncommercial species.*
- *Control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures.*
- *Reduce waste to biologically and socially acceptable levels.*
- *Continue to improve the retention of groundfish where practicable, through establishment of minimum groundfish retention standards.*

Various mitigation measures are regularly investigated. For example, the U.S. West Coast and Alaska Trawl Fisheries Seabird Cable Strike Mitigation Workshop was held in November 2017. The workshop was hosted by a Steering Committee consisting of members from NOAA's Northwest Fisheries Science Center, AFSC, and the Alaska Regional Office. The goal of the workshop was to identify effective, practical mitigation measures to reduce seabird cable strike mortality in the CP west coast hake and Alaska trawl fisheries. Workshop participants decided that the following physical mitigation measures should be prioritized:

1. Snatch block
2. Water deterrent
3. Visibility of third wire
4. Combination of warp booms
5. Third wire float device

This workshop was the first held on the subject, and the plan is to have it be a recurring activity. Additionally, the following next steps were proposed at the conclusion of the workshop:

- Explore funding opportunities
- Specific to Alaska, continue to be collect seabird mortality data (through the North Pacific Groundfish and Halibut Observer Program); analyze, summarize, and publish cable strike data; complete 2010-2016 seabird bycatch data analysis to provide information on scope problem for Alaska trawl fisheries; and engage with specialists on how additional seabird data can be extrapolated to fleetwide estimates
- Specific to industry, produce technical paper (with assistance from NMFS) on importance and application of hard-wired net monitoring devices for submission to the ACAP Seabird Bycatch Working Group and fabricate and test the various physical mitigation measure options

These regulations and measures can be considered a strategy so SG60 and SG80 are met. However, since the strategy does not explicitly consider minor secondary species, SG100 is not met.

Management strategy evaluation				
<b>b</b>	Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is <b>some objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

#### All UoAs

The recent seabird bycatch estimates for Alaska show a continued low rate of bycatch. Therefore, it can be concluded that the strategy is likely to work. SG60 and SG80 are met. As noted above, there have been some increases in recent years. This along with the lack of testing to support higher confidence means that SG100 is not met.

Management strategy implementation				
<b>c</b>	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective as set out in scoring issue (a)</b> .
	Met?		<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
Rationale				

#### All UoAs

Given the continued low rate of bycatch in recent years, there is clear evidence that the strategy is being implemented successfully and is achieving its objective. SG80 and SG100 are met.

Shark finning				
<b>d</b>	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

## Rationale

There are no secondary shark species in these UoAs; therefore, this scoring issue (SI) is not scored.

## Review of alternative measures to minimise mortality of unwanted catch

<b>e</b>	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of all secondary species, and they are implemented, as appropriate.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>

## Rationale

All UoAs

The Council meets five times per year, at which time Council staff reviews alternative measures to minimize unwanted catch and discuss relevant management measures. The SAFE reports that are published annually also discuss the overlap of target and non-target stocks; however, it is not clear that all secondary species are considered on a biennial basis. Therefore, all UoAs meet SG60 and SG80 but not SG100.

## References

Eich et al. 2017, 2018; Jannot et al. 2018; NPFMC 2018a, 2018b

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>60-79</b>
Information gap indicator	<b>More information sought</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 85</b>
Condition number (if relevant)	

## PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main secondary species with respect to status.  OR <b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and <b>adequate to assess</b> the impact of the UoA on main secondary species with respect to status.  OR <b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main secondary species with respect to status.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
	Rationale			

All UoAs

With 100% observer coverage, there is quantitative information gathered and reviewed annually. This information is adequate to assess the UoAs' impact on the main secondary species with a high degree of certainty. Therefore, SG60, SG80, and SG100 are met.

Information adequacy for assessment of impacts on minor secondary species				
<b>b</b>	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			<b>All UoAs – No</b>
Rationale				

All UoAs

While the UoAs' impact on all secondary species is known (i.e., the catch data lists all species caught and the number/weight of each), there is not adequate information to know the UoAs' impact on the status of all secondary species as the status of some of these are unknown. Therefore, SG100 is not met.

Information adequacy for management strategy				
<b>c</b>	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> secondary species, and <b>evaluate</b> with a <b>high degree of certainty</b> whether the strategy is <b>achieving its objective</b> .



	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – No
Rationale				

All UoAs

The UoAs' impact and the species' status are known. The UoAs are known to have little to no impact on the main secondary species given low bycatch numbers and the high population estimates. The information is adequate to support the strategy for the main secondary species so SG60 and SG80 are met. While there is a strategy, it does not consider all secondary species so SG100 is not met.

## References

Eich et al. 2018, Krieger et al. 2019

**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	<b>60-79</b>
Information gap indicator	<b>More information sought</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 85</b>
Condition number (if relevant)	

## PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the <b>effects of the UoA</b> on the population/ stock are known and <b>likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, the <b>combined effects of the MSC UoAs</b> on the population /stock are known and <b>highly likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a <b>high degree of certainty</b> that the <b>combined effects of the MSC UoAs</b> are within these limits.
	Met?	<b>BSAI Atka mackerel – Yes</b> <b>BSAI Pacific Ocean perch and BSAI northern rockfish – Yes</b> <b>GOA UoAs – Yes</b>	<b>BSAI Atka mackerel – Yes</b> <b>BSAI Pacific Ocean perch and BSAI northern rockfish – Yes</b> <b>GOA UoAs – Yes</b>	<b>BSAI Atka mackerel – No</b> <b>BSAI Pacific Ocean perch and BSAI northern rockfish – No</b> <b>GOA UoAs – No</b>
Rationale				

BSAI Atka mackerel

This UoA's ETP species are bearded sea lion, ribbon seal, Steller sea lion, Bairdi tanner crab, blue king crab, chinook salmon, golden king crab, non-chinook salmon, Opilio tanner crab, Pacific halibut, Pacific herring, red king crab, and Leach's storm petrel.

## Marine mammals:

According to the 2019 LOF, the UoA is a category III, meaning there is a remote likelihood of or no known interactions with bearded seal, ribbon seal, and Steller sea lion. The bearded seal lion's most recent stock assessment report (2012) estimated the population in U.S. waters to be 299,174. The PBR for U.S. portion of the BS is 8,210, though this is not a PBR for the entire stock because a reliable stock assessment of the entire stock is not available. This UoA had one observed interaction in 2015. The ribbon seal's most recent stock assessment report (2014) estimated the Alaska resident population at 184,000. The PBR for this stock is 9,785, and the UoA had zero observed interactions in 2015. With regard to Stellar sea lions, the most recent stock assessment report (2016) estimated the Steller sea lion western U.S. stock population at 53,303, which includes pups and non-pups. The PBR for this stock is 326, and the UoA had zero observed interactions in 2015. Therefore, it likely has a negligible impact on these populations.

## Fish and crustaceans:

While these prohibited species have limits, not all are hard limits. In some cases, other protection measures have been deemed better (e.g., the Pribilof Islands Habitat Conservation Area is closed to all trawling because that is where the blue king crab stock is concentrated). Therefore, this SI covers only those species with hard limits: Bairdi tanner crab, Opilio tanner crab, Pacific halibut, Pacific herring, and red king crab. The UoA's 2018 catches of each of these species were well below their PSC limits. Therefore, it likely has a negligible impact on these populations.

## Seabirds:

There are no national or international limits for seabirds so this scoring element is not considered in this SI.

## Overall:

The UoA's catch numbers for all of these ETP species are relatively low so SG60 is met for all scoring elements. Based on catch data from the MSC UoAs, it is highly likely that all MSC UoAs' combined effects are within these limits so SG80 is met for all scoring elements. However, some of the MSC UoAs' updated catch data were not available at the time of this assessment so SG100 is not met since there is not a high degree of certainty. (This scoring will be reviewed before the PCDR stage when the other data will be available.)

BSAI Pacific Ocean perch and BSAI northern rockfish

These UoAs' ETP species are killer whale (eastern North Pacific Alaska resident), killer whale (GOA, AI, and BS transient), ribbon seal, Bairdi tanner crab, blue king crab, chinook salmon, golden king crab, non-chinook salmon, Opilio tanner crab, Pacific halibut, Pacific herring, red king crab, and Laysan albatross.

**Marine mammals:**

According to the 2019 LOF, these UoAs are a category II, meaning they have occasional interactions with the two killer whale stocks. The eastern North Pacific Alaska resident killer whale's most recent stock assessment report (2016) estimated the population at 2,347. The PBR for this stock is 24, and the UoAs had zero observed interactions in 2015. The GOA, AI, and BS transient killer whale's most recent stock assessment report (2016) estimated the Alaska resident population at 587. The PBR for this stock is 5.87, and the UoAs had zero observed interactions in 2015. While not listed on the 2019 LOF, these UoAs have also had recent interactions with ribbon seals. The ribbon seal's most recent stock assessment report (2014) estimated the Alaska resident population at 184,000. The PBR for this stock is 9,785, and the UoAs had one observed interaction in 2014 but none in 2015. Therefore, they likely have a negligible impact on these populations.

**Fish and crustaceans:**

As with above, not all prohibited species have hard limits so this SI covers only those species with hard limits: Bairdi tanner crab, Opilio tanner crab, Pacific halibut, Pacific herring, and red king crab. The UoAs' 2018 catches of each of these species were well below their PSC limits. Therefore, it likely has a negligible impact on these populations.

**Seabirds:**

There are no national or international limits for seabirds so this scoring element is not considered in this SI.

**Overall:**

The UoAs' catch numbers for all of these ETP species are relatively low so SG60 is met for all scoring elements. Based on catch data from the MSC UoAs, it is highly likely that all MSC UoAs' combined effects are within these limits so SG80 is met for all scoring elements. However, some of the MSC UoAs' updated catch data were not available at the time of this assessment so SG100 is not met since there is not a high degree of certainty. (This scoring will be reviewed before the PCDR stage when the other data will be available.)

**GOA UoAs**

These UoAs' ETP species are Steller sea lion, Bairdi tanner crab, blue king crab, chinook salmon, golden king crab, non-chinook salmon, Opilio tanner crab, Pacific halibut, Pacific herring, and red king crab.

**Marine mammals:**

According to the 2019 LOF, the UoAs are a category III, meaning there is a remote likelihood of or no known interactions with Steller sea lion. The Steller sea lion's the most recent stock assessment report (2016) estimated the Steller sea lion western U.S. stock population at 53,303, which includes pups and non-pups. The PBR for this stock is 326, and the UoAs had one observed interaction in 2015. Therefore, they likely have a negligible impact on the population.

**Fish and crustaceans:**

As with above, not all prohibited species have hard limits so this SI covers only those species with hard limits: Chinook salmon and Pacific halibut. The UoAs' 2018 catches of each of these species were well below their PSC limits. Therefore, they likely have a negligible impact on these populations.

**Seabirds:**

These UoAs do not have any recent interactions with any ETP seabird species so this scoring element is not considered in this SI.

**Overall:**

The UoAs' catch numbers for all of these ETP species are relatively low so SG60 is met for all scoring elements. Based on catch data from the MSC UoAs, it is highly likely that all MSC UoAs' combined effects are within these limits so SG80 is met for all scoring elements. However, some of the MSC UoAs' updated catch data were not available at the time of this assessment so SG100 is not met since there is not a high degree of certainty. (This scoring will be reviewed before the PCDR stage when the other data will be available.)

Direct effects				
<b>b</b>	Guide post	Known direct effects of the UoA are likely to not <b>hinder recovery</b> of ETP species.	Direct effects of the UoA are <b>highly likely</b> to not <b>hinder recovery</b> of ETP species.	There is a <b>high degree of confidence</b> that there are no <b>significant detrimental direct effects</b> of the UoA on ETP species.
	Met?	<b>BSAI Atka mackerel – Yes</b> <b>BSAI Pacific Ocean perch</b>	<b>BSAI Atka mackerel – Yes</b> <b>BSAI Pacific Ocean perch</b>	<b>BSAI Atka mackerel – Yes</b> <b>BSAI Pacific Ocean perch</b>

	and BSAI northern rockfish – Yes GOA UoAs – Yes	and BSAI northern rockfish – Yes GOA UoAs – Yes	and BSAI northern rockfish – Yes GOA UoAs – Yes
Rationale			

#### BSAI Atka mackerel

##### Marine mammals:

Most marine mammal populations do not have long-term trend data, but since only the Steller sea lion is listed on the ESA and therefore needing recovery, it is the only species considered in this SI. Data collected through 2017 show strong evidence that the western stock population in Alaska was at its lowest in 2002 and has increased at over 2% per year between 2002 and 2017. Catch data and observer coverage show that the UoA has little or no fatal interactions with Steller sea lions in recent years. When there has been an interaction, the UoA has been well below the species' PBR. Given the extremely low rates of interaction and the fact that the population is rebounding, there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on the species. The marine mammal scoring element meets SG60, SG80, and SG100.

##### Fish and crustaceans:

While several salmon populations are ESA listed, none are within Alaskan waters. Additionally, none of the other fish or crustacean species are ESA listed either so this scoring element is not considered in this SI.

##### Seabirds:

None of the seabird species encountered by the UoA are ESA listed so this scoring element is not considered in this SI.

##### Overall:

Since the only scoring element being scored in this SI meets SG100, overall the UoA meets SG100.

#### BSAI Pacific Ocean perch and BSAI northern rockfish

##### Marine mammals:

None of the marine mammals encountered by these UoAs are ESA listed so this scoring element is not considered in this SI.

##### Fish and crustaceans:

None of the fish or crustacean species encountered by these UoAs are ESA listed so this scoring element is not considered in this SI.

##### Seabirds:

None of the seabird species encountered by these UoAs are ESA listed so this scoring element is not considered in this SI.

##### Overall:

While the ETP species encountered by the UoAs are protected, their populations are not declining and/or have not been in a declined state so they do not need recovery. Therefore, the UoAs are not hindering recovery so SG60, SG80, and SG100 are met.

#### GOA UoAs

##### Marine mammals:

The Steller sea lion is listed on the ESA as endangered and therefore is needing recovery. Data collected through 2016 show strong evidence that the western stock population in Alaska was at its lowest in 2002 and 2003 and has increased at over 2% per year between 2003 and 2016. Catch data and observer coverage show that the UoAs have little or no fatal interactions with Steller sea lions in recent years. When there has been an interaction, the UoAs have been well below the species' PBR. Given the extremely low rates of interaction and the fact that the population is rebounding, there is a high degree of confidence that there are no significant detrimental direct effects of the UoAs on the species. The marine mammal scoring element meets SG60, SG80, and SG100.

##### Fish and crustaceans:

None of the fish or crustacean species encountered by these UoAs are ESA listed so this scoring element is not considered in this SI.

##### Seabirds:

These UoAs do not have any recent interactions with any ETP seabird species so this scoring element is not considered in this SI.

Overall:

Since the only scoring element being scored in this SI meets SG100, overall the UoAs meet SG100.

Indirect effects				
<b>C</b>	Guide post		Indirect effects have been considered for the UoA and are thought to be <b>highly likely</b> to not create unacceptable impacts.	There is a <b>high degree of confidence</b> that there are no <b>significant detrimental indirect effects</b> of the UoA on ETP species.
	Met?		<b>BSAI Atka mackerel – Yes</b> <b>BSAI Pacific Ocean perch and BSAI northern rockfish – Yes</b> <b>GOA UoAs – Yes</b>	<b>BSAI Atka mackerel – No</b> <b>BSAI Pacific Ocean perch and BSAI northern rockfish – No</b> <b>GOA UoAs – No</b>
Rationale				

#### All UoAs

NMFS's EISs and the Council's FEPs and FMPs consider the direct and indirect impacts of the UoAs on these ETP species. The UoAs' footprint relative to the species' ranges are comparably quite small. Additionally, large portions of the BSAI and GOA are closed to bottom trawling. Specifically, Steller sea lion management has designated critical habitat areas to buffer haul-out and rookery areas so the UoAs are less likely to impact important habitats for the sea lion or to cause it additional stress by getting too close. Therefore, it is concluded that what little take does occur is highly unlikely to alter the overall ecosystem to the point of creating unacceptable impacts. SG80 is met. SG100 is not met since this cannot be said with a high degree of confidence.

#### References

ACAP 2010; Helker et al. 2017; Muto et al. 2018, 2019; NMFS 2004, 2005, 2014b, 2019b, 2019c; NPFMC 2007, 2018a, 2018b, 2019e; <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0FS>; <https://www.iucnredlist.org/species/17367725/66991984>; <https://acap.aq/en/acap-species/307-acap-species-list/file>; <https://www.govinfo.gov/content/pkg/FR-2018-02-27/pdf/2018-03918.pdf>; <https://www.govinfo.gov/content/pkg/FR-2018-03-01/pdf/2018-04124.pdf>

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>60-79</b>
Information gap indicator	<b>More information sought</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 85</b>
Condition number (if relevant)	

## PI 2.3.2 – ETP species management strategy

PI 2.3.2		The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> <li>- meet national and international requirements;</li> <li>- ensure the UoA does not hinder recovery of ETP species.</li> </ul> Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
Management strategy in place (national and international requirements)				
a	Guide post	There are <b>measures</b> in place that minimise the UoA-related mortality of ETP species, and are expected to be <b>highly likely to achieve</b> national and international requirements for the protection of ETP species.	There is a <b>strategy</b> in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be <b>highly likely to achieve</b> national and international requirements for the protection of ETP species.	There is a <b>comprehensive strategy</b> in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to <b>achieve above</b> national and international requirements for the protection of ETP species.
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – No
Rationale				

All UoAs

There is a strategy in place to manage the UoAs' impacts on ETP species. This strategy is designed to minimize ETP species mortality by the UoAs and is highly likely to achieve national and international requirements and to ensure the UoAs do not hinder recovery. The FMPs outline how the UoAs manage interactions with ETP species and work to limit such interactions, including measures that have established conservation zones and have implemented gear restrictions and time/area closures to reduce bycatch of ETP species. The FMPs also state that the UoAs shall follow the numerous requirements laid out by the ESA and MMPA. Therefore, SG60 and SG80 are met. While there arguably is a comprehensive strategy in place, it is not designed to achieve above national and international requirements so SG100 is not met.

Management strategy in place (alternative)				
b	Guide post	There are <b>measures</b> in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>strategy</b> in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>comprehensive strategy</b> in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	N/A	N/A	N/A
Rationale				

Not applicable since there are national and international requirements in place for most ETP species. Therefore, all ETP species are assessed under SI a since either SI a or b is scored.

Management strategy evaluation				
c	Guide post	The measures are <b>considered likely</b> to work, based on <b>plausible argument</b> (e.g., general experience, theory or comparison with similar fisheries/species).	There is an <b>objective basis for confidence</b> that the measures/strategy will work, based on <b>information</b> directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a <b>quantitative analysis</b> supports <b>high confidence</b> that the strategy

				will work.
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – No
Rationale				

All UoAs

There is an objective basis for confidence that the strategy will work. The UoAs have had little or no bycatch of the ETP species, showing that the strategy has worked and will likely continue to work. Further, the strategy is based on information directly about the fishery and the ETP species involved. Measures, such as gear modifications and area closures, are done with the UoAs and species in mind to ensure intended bycatch minimization and/or recovery goals are met. Therefore, SG60 and SG80 are met. SG100 is not met since a quantitative analysis has not been done to support the confidence level.

Management strategy implementation				
d	Guide post		There is some <b>evidence</b> that the measures/strategy is being implemented successfully.	There is <b>clear evidence</b> that the strategy/comprehensive strategy is being implemented successfully and <b>is achieving its objective as set out in scoring issue (a) or (b).</b>
	Met?		<b>BSAI UoAs – Yes</b> <b>GOA UoAs – Yes</b>	<b>BSAI UoAs – No</b> <b>GOA UoAs – Yes</b>
Rationale				

BSAI UoAs

Overall, the UoAs continue to have minimal interaction with ETP species; however, there has been a recent increase in catch of Leach's storm petrel (UoA 1) and Laysan albatross (UoAs 2-3). Therefore, there is some evidence (instead of clear evidence) that the strategy is being implemented successfully. SG80 is met. Since the reason(s) for these increases in ETP seabird bycatch is not known, SG100 is not met.

GOA UoAs

These UoAs continue to have minimal interaction with ETP species so they meet SG60, SG80, and SG100.

Review of alternative measures to minimize mortality of ETP species				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – Yes
Rationale				

All UoAs

The Council meets five times per year, at which time Council staff update and present a report on protected species and discuss relevant management measures. The SAFE reports that are published annually also discuss ecosystem and protected species status. Therefore, SG60, SG80, and SG100 are met.

## References

NFMPC 2018a, 2018b; Eich et al. 2017, 2018

**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	≥80
Information gap indicator	<b>Information sufficient to score PI but additional information could increase score</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>BSAI UoAs – 85 GOA UoAs – 90</b>
Condition number (if relevant)	



## PI 2.3.3 – ETP species information

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including:		
		<ul style="list-style-type: none"> <li>- Information for the development of the management strategy;</li> <li>- Information to assess the effectiveness of the management strategy; and</li> <li>- Information to determine the outcome status of ETP species</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is <b>adequate to estimate</b> the UoA related mortality on ETP species.  <b>OR</b> <b>If RBF is used to score PI 2.3.1 for the UoA:</b> Qualitative information is <b>adequate to estimate productivity and susceptibility</b> attributes for ETP species.	Some quantitative information is <b>adequate to assess</b> the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.  <b>OR</b> <b>If RBF is used to score PI 2.3.1 for the UoA:</b> Some quantitative information is <b>adequate to assess productivity and susceptibility</b> attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the <b>magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status</b> of ETP species.
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – Yes
Rationale				

All UoAs

The vessels within these UoAs have 100% observer coverage with two observers onboard at all times. The GOA vessels may elect to take one observer when fishing outside of the Rockfish Program, which is rare. However, this is still 100% coverage. All fatal and non-fatal interactions with marine mammals and seabirds are recorded, and catch numbers for the prohibited fish and crustacean species are part of the UoAs' overall catch totals. This information is used to track the UoAs' overall impact on ETP species and to aid management measure discussions and decisions. Therefore, quantitative information is available to adequately assess with a high degree of certainty the UoAs' impacts on ETP species. The SG60, SG80, and SG100 are met.

Information adequacy for management strategy				
b	Guide post	Information is adequate to support <b>measures</b> to manage the impacts on ETP species.	Information is adequate to measure trends and support a <b>strategy</b> to manage impacts on ETP species.	Information is adequate to support a <b>comprehensive strategy</b> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a <b>high degree of certainty</b> whether a strategy is achieving its objectives.
	Met?	All UoAs – Yes	All UoAs – Yes	All UoAs – No
Rationale				

All UoAs

With annual data collection and analysis and 100% observer coverage for all relevant ETP species, it can be concluded that the information is adequate to measure the UoAs' catch trends and support the strategy for managing the UoAs' impacts. Therefore, SG60 and SG80 are met, but SG100 is not met since there is not a comprehensive strategy.

## References

NFMPC 2018a, 2018b

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI but additional information could increase score

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	All UoAs – 90
Condition number (if relevant)	

## PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Commonly encountered habitat status			
	Guide post	The UoA is <b>unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	<b>All – Yes</b>	<b>All – Yes</b>	<b>All – Yes</b>
Rationale				

All UoAs

The commonly encountered habitats are soft bottom (i.e., mud and sand), mixed bottom (i.e., gravel), and hard bottom (i.e., cobble and boulders). Several studies show stable, muddy or structurally complex habitats recover more slowly than sandy sediment. Based on extensive work by NOAA, relatively limited areas are impacted to a level that would potentially constitute serious or irreversible harm. Since 2003, only 14% of the area open to trawling has been fished. Additionally, habitat reduction plots in the BSAI and GOA for these UoAs show relatively little habitat impact over the last 10-15 years, and in some case, the impact has been reduced due to gear modifications (e.g., sweep modifications). Given this plus the fact that these commonly encountered habitats occur over ranges totaling nearly 1 million km<sup>2</sup>, extending beyond the UoAs' footprint, it can be concluded that there is evidence that the UoAs are highly unlikely to reduce structure and function of the commonly encountered habitat to a point where there would be serious or irreversible harm. Therefore, SG60, SG80, and SG100 are met.

VME habitat status				
<b>b</b>	Guide post	The UoA is <b>unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	<b>All – Yes</b>	<b>All – Yes</b>	<b>All – Yes</b>
Rationale				

All UoAs

The VMEs for these UoAs are the designated EFHs, HAPCs, and other closed and protected areas; red tree corals; and sea pens and sea whips.

EFHs, HAPCs, and other closed and protected areas:

These areas are closed to trawling and/or protected (the skate egg concentration area is monitored but not closed). Therefore, it is highly unlikely that serious or irreversible harm is occurring. SG60 and SG80 are met. Given that fishing within these areas is prohibited and there have been no known enforcement issues with these UoAs, there is evidence that the UoAs are highly unlikely to reduce the structure and function of seamounts. SG60, SG80, and SG100 are met for this scoring element.

Corals and sea pens/whips:

Known areas with corals and seamounts are closed to trawling. However, corals and sea pens/whips have been encountered (as per catch data). As noted above, the UoAs' VMS data show that they fish in the same areas over and over. The bycatch of these species has been zero or almost zero for the last several years; therefore, there is

evidence that the UoAs are highly unlikely to reduce structure and function of corals and sea pens/whips so SG60, SG80, and SG100 are met for these scoring elements.

Minor habitat status			
<b>C</b>	Guide post		There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?		<b>All UoAs – No</b>
Rationale			

There is not sufficient evidence with regard to minor habitats so none of the UoAs meets SG100.

## References

Kaiser et al. 2006; NPFMC 2018a, 2018b; John Olson, pers. comm.

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI but additional information could increase score</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 95</b>
Condition number (if relevant)	

## PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a <b>partial strategy</b> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a <b>strategy</b> in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
Rationale				

All UoAs

The Council has implemented a combination of mitigation measures for these UoAs focused on limiting impact. Several closed and protected areas have been established with the intent to protect EFHs, HAPCs, and other sensitive areas. Gear modifications have also been implemented to limit trawl gear impact. These measures can be considered a strategy. Therefore, the SG60 and SG80 are met. The Council utilizes EBFM and manages the area by considering all fisheries that potentially impact the habitats in the BSAI and GOA. Therefore, the FMPs for these UoAs also cover other MSC UoAs and non-MSC fisheries. SG100 is met.

Management strategy evaluation				
<b>b</b>	Guide post	The measures are <b>considered likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on <b>information directly about the UoA and/or habitats</b> involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on <b>information directly about the UoA and/or habitats</b> involved.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

All UoAs

Research and inference provide some objective basis for confidence that identifying sensitive areas and implementing measures to protect them, to the extent practicable, will work. SG60 and SG80 are met. Testing to support high confidence is not available so SG100 is not met.

Management strategy implementation				
<b>c</b>	Guide post		There is <b>some quantitative evidence</b> that the measures/partial strategy is being implemented successfully.	There is <b>clear quantitative evidence</b> that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
Rationale				

All UoAs

Based on VMS, vessels do not fish within the closed areas. The observer data show that while coral and sea pens/whips are encountered, the catch rate is minimal. Therefore, there is clear quantitative evidence that the strategy is being implemented successfully. SG60, SG80, and SG100 are met.

Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs				
d	Guide post	There is <b>qualitative evidence</b> that the UoA complies with its management requirements to protect VMEs.	There is <b>some quantitative evidence</b> that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is <b>clear quantitative evidence</b> that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
Rationale				

#### All UoAs

No known enforcement issues with these UoAs, the other MSC UoAs, or non-MSC fisheries have occurred in recent years. Also, since the other MSC UoAs and non-MSC fisheries are all under the same management as these UoAs, there is clear quantitative evidence that, where relevant, all fisheries are complying with management requirements and protection measures. SG60, SG80, and SG100 are met.

#### References

NPFMC 2018a, 2018b, 2019a, 2019b, 2019c, 2019d

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI but additional information could increase score</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 95</b>
Condition number (if relevant)	

## PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information quality			
	Guide post	<p>The types and distribution of the main habitats are <b>broadly understood</b>.</p> <p><b>OR</b></p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b> Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and <b>vulnerability</b> of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p><b>OR</b></p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b> Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

All UoAs

A comprehensive inventory of bottom habitat data in the BSAI and GOA has been done. The types, distributions, and vulnerability of the main habitats in the BSAI and GOA are known at the scale relevant to the UoAs as described in the EFH report and FMPs and by NOAA data. Habitats in the AI are less well understood, but there is a basic understanding of the main types and general distributions and their vulnerabilities, again at a scale relevant to the UoAs. Therefore, SG60 and SG80 are met. SG100 is not met since the distribution of all habitats is not known over their range.

Information adequacy for assessment of impacts				
<b>b</b>	Guide post	<p>Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.</p> <p><b>OR</b></p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b> Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.</p>	<p>Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.</p> <p><b>OR</b></p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b> Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.</p>	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>

## Rationale

All UoAs

The FMPs, EFH report, 5-year review of EFH, and NOAA data provide information that is adequate to allow for identification of the main impacts of gear use of the UoAs on the main habitats in the BSAI and GOA. Model estimates of long-term bottom habitat impacts of trawl gear used in the UoAs provide sufficient data to allow the nature of impact and their spatial extent to be generally determined. Therefore, SG60 and SG80 are met. SG100 is not met since the physical impacts on all habitats have not been quantified fully.

Monitoring				
<b>C</b>	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

All UoAs

Adequate information by means of VMS and the North Pacific Observer Program continue to be collected from the UoAs to detect any change in the distribution of the fishery and, therefore, in risk to the main habitat. VMS provides high-resolution information on the spatial extent of the fishery, whereas the observer program collects detailed information on the nature and composition of the bycatch from the UoAs. SG 80 is met. This information is not adequate to signal changes in all habitat distributions over time so SG100 is not met.

## References

Clausen and Heifetz 2002; Cunningham et al. 2018; Fenske et al. 2018; Love et al. 2002; Lowe et al. 2018; McConnaughey et al. 2009; NOAA 2005; NPFMC 2018a, 2018b; Olson 2015; Reuter 1999; Simpson et al. 2017; Spencer and Ianelli 2018

**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI but additional information could increase score</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 80</b>
Condition number (if relevant)	



## PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Ecosystem status			
	Guide post	The UoA is <b>unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is <b>highly unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

All UoAs

Bottom trawling can alter the overall ecosystem by resuspending sediments and reducing complexity, structure, and diversity, which can lead to changes in community production and trophic structure and function. As part of the annual SAFE report review and regular FMP review, the Council examines the status of the ecosystem component species (species that are not actively managed, targeted, or generally retained) to determine whether or not any of those species should be managed. Consistent with the objectives of the Council's FMPs and FEPs, the development of directed commercial fisheries for these species is prohibited until and unless the Council has had adequate opportunity to assess relevant scientific information and consider potential impacts on existing fisheries, fishing communities, and the greater marine ecosystem. The Council can reconsider the species' classification at any time.

Through these various assessments and plans (i.e., stock assessments, EISs, FEPs, and FMPs), the Council considers different aspects of the overall ecosystem. It is clear that the UoAs' impacts on the ecosystem are taken seriously, that appropriate research is being developed, and that the research outputs are taken into account in the consideration of management actions. Since these assessments and plans consider the UoAs' impacts on the overall ecosystem and take management steps to protect the ecosystem (e.g., closed areas) and given the nature and amounts of primary and secondary species, the limited interactions with ETP species, and habitat and ecosystem analyses, it is highly unlikely that the UoAs are disrupting the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. Therefore, SG60 and SG80 are met. SG100 is not met since more specific research about the ecosystem and the UoAs would be needed to constitute "evidence".

## References

Aydin and Meuter 2007; Aydin et al. 2007; Gaichas and Francis 2008; Gaichas et al. 2011, 2012; NPFMC 2007, 2018a, 2018b, 2019e; Siddon and Zador 2018; Zador and Ortiz 2018; Zador and Yasumiishi 2018

**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI but additional information could increase score</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 80</b>
Condition number (if relevant)	

## PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary which take into account the <b>potential impacts</b> of the UoA on key elements of the ecosystem.	There is a <b>partial strategy</b> in place, if necessary, which takes into account <b>available information and is expected to restrain impacts</b> of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a <b>strategy</b> that consists of a <b>plan</b> , in place which contains measures to <b>address all main impacts of the UoA</b> on the ecosystem, and at least some of these measures are in place.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
Rationale				

All UoAs

The Council has been committed to the development and implementation of EBFM for some time. The principles and goals of EBFM are described in the BSAI and GOA FMPs. The Council's Ecosystem Committee provides advice to the Council on North Pacific ecosystem issues, considers management measures in the light of national ecosystem discussions, and suggests how the Council can engage in EBFM. The Council has developed BS and AI FEPs, which are strategic policy and planning documents that can provide the Council with both an "early warning system" and an ecosystem context for fishery management decisions affecting the BSAI area. The Council also produces annual Ecosystem Status Reports for the EBS, AI, and GOA. These reports compile and summarize ecosystem status information and include status report cards, integrated ecosystem assessments, and EBFM indicators that provide a context for EBFM decisions.

Food web modelling using Ecopath/Ecosim has been carried out for EBS, AI, and GOA, and this information is used within the annual SAFE reports when determining the role of the UoAs in the food web. For example, the UoAs' relative importance as a prey species is determined and evaluated. The UoAs are also monitored and managed in relation to marine mammal predators includes the setting of mortality limits and additional protection measures, such as fishery exclusion from EFHs. Overall, the Council's approach to these UoAs explicitly includes EBFM principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. This includes the setting of outcome indicators relating to preserving the food web; managing incidental catch; and avoiding impacts on seabirds, mammals, and habitats. Given all of this, it can be said that there is strategy in place that consists of plans for both BSAI and GOA that address the UoAs' main impacts on the ecosystem. SG60, SG80, and SG100 are met.

Management strategy evaluation				
<b>b</b>	Guide post	The <b>measures</b> are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is <b>some objective basis for confidence</b> that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	<b>Testing supports high confidence</b> that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

All UoAs

There is also some objective basis for confidence that the strategy is working and being implemented successfully since annual species SAFE reports and ecosystem status reports are produced, analyzing observer data for the UoAs

on the amount and composition of primary and secondary species and interactions with ETP species, habitats, and the ecosystem. Therefore, SG60 and SG80 are met. There is no testing directly about the UoAs to support high confidence so SG100 is not met.

Management strategy implementation				
C	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective as set out in scoring issue (a)</b> .
	Met?		All UoAs – Yes	All UoAs – Yes
Rationale				

#### All UoAs

VMS and observer data provide some quantitative evidence that the strategy is being implemented successfully so SG80 is met. Given that the Council is responsive to the UoAs' impacts and the ecosystem's changes and that some species populations and habitats have experienced recovery, there is clear evidence of successful implementation of the strategy. Therefore, SG100 are met.

#### References

NPFMC 2007, 2018a, 2018b, 2019e; Siddon and Zador 2018; Zador and Ortiz 2018; Zador and Yasumiishi 2018

#### **Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI but additional information could increase score</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 90</b>
Condition number (if relevant)	

## PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information quality			
	Guide post	Information is adequate to <b>identify</b> the key elements of the ecosystem.	Information is adequate to <b>broadly understand</b> the key elements of the ecosystem.	
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	
Rationale				

All UoAs

Information in BSAI and GOA is adequate to identify key elements of the ecosystem, as demonstrated qualitative and quantitative descriptions of the status of the ecosystems. Quantitative models of the ecosystems demonstrate that information is adequate to broadly understand the key elements of the ecosystems. Therefore, SG60 and SG80 are met.

Investigation of UoA impacts				
<b>b</b>	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but <b>have not been investigated</b> in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and <b>some have been investigated in detail.</b>	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and <b>have been investigated in detail.</b>
	Met?	<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

All UoAs

Bottom trawling can alter the overall ecosystem by resuspending sediments and reducing complexity, structure, and diversity, which can lead to changes in community production and trophic structure and function. Through SAFE reports, Ecosystem Status Reports, EISs, FEPs, and FMPs, a great deal of information is collected and reviewed regularly and is used to infer the UoAs' impacts on the key ecosystem elements. Some impacts, such as trawling on the seafloor and overall ecosystem structure, are known and have been investigated in detail when determining the appropriate EFH and HAPC locations. The UoAs' impacts on marine mammals and seabirds can be inferred from existing information, and some have been investigated in detail. Therefore, SG60 and SG80 are met. SG100 is not met since all main interaction have not been investigated in detail.

Understanding of component functions				
<b>c</b>	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are <b>known</b> .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are <b>understood</b> .
	Met?		<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

All UoAs

The main functions of and impacts on the components of the ecosystem are known through extensive biological sampling associated with regular surveys conducted by NMFS through its Resource Assessment and Conservation

Engineering Division, Marine Mammal Laboratory, Resource Ecology and Fisheries Management Division, and the North Pacific Observer Program. The main impacts of the UoAs on target, primary, secondary, and ETP species have been identified, and the main functions of these components are understood through extensive quantitative modeling of the ecosystem. Therefore, SG80 is met. SG100 is not met since all main functions are not understood.

Information relevance				
<b>d</b>	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components <b>and elements</b> to allow the main consequences for the ecosystem to be inferred.
	Met?		<b>All UoAs – Yes</b>	<b>All UoAs – No</b>
Rationale				

#### All UoAs

Analyses conducted for the EFH EIS provide sufficient information of the UoAs' impacts on bottom fauna, and ecosystem modeling and data on seabird and marine mammal taken from the observer program have provided sufficient information of the UoAs' impacts on other components of the ecosystem. These analyses and models also allow the main consequences for the ecosystem to be inferred. Therefore, SG80 is met. SG100 is not met since the elements, in addition to the components, are not understood.

Monitoring				
<b>e</b>	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		<b>All UoAs – Yes</b>	<b>All UoAs – Yes</b>
Rationale				

#### All UoAs

The SAFE reports, Ecosystem Status Reports, EISs, FEPs, and FMPs are updated on a regular basis and consider new information and data that have been collected, analyzed, and reviewed. This information and data are used to, among other things, detect an increased risk to the ecosystem components (e.g., bycatch, habitats, community composition). This information is also used in, for example, the FEPs and FMPs in support of the development of management strategies. Therefore, SG80 and SG100 are met.

### References

Aydin and Meuter 2007; Aydin et al. 2007; Dragoo et al. 2019; Gaichas and Francis 2008; Gaichas et al. 2011, 2012; Muto et al. 2018; NMFS 2005; NPFMC 2007, 2018a, 2018b, 2019e; Siddon and Zador 2018; Simpson et al. 2017; Zador and Ortiz 2018; Zador and Yasumiishi 2018

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI but additional information could increase score</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>All UoAs – 85</b>
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Condition number (if relevant)	
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## 5.4 Principle 3

### 5.4.1 Area of operation

The BSAI and GOA Atka mackerel, Pacific Ocean perch, and rockfish fisheries are conducted in the U.S. EEZ waters of the BSAI and GOA (Figure 29). The principle legislative instrument for fisheries management in the U.S. is the MSFCMA or the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) and is implemented by the NMFS. The Council is one of eight regional councils established by the MSRA to manage fisheries in the 200-mile EEZ. The Council primarily manages groundfish in the GOA and BSAI, targeting cod, pollock, flatfish, mackerel, sablefish, and rockfish species harvested by trawl, longline, jig, and pot gear (NPFMC 2009). Historically, with implementation of the MSRA, annual Alaska Atka mackerel and rockfish quotas (or catch targets) had been used to limit the catch by foreign and domestic fisheries. The Council also makes allocation decisions for halibut, in concert with the International Pacific Halibut Commission that biologically manages the resource for U.S.-Canada waters. Other large Alaska fisheries for salmon, crab, and scallops are managed jointly with the State of Alaska. The Council also works very closely with the Alaska Department of Fish and Game (ADFG) and the Alaska Board of Fisheries (BOF) to coordinate management programs in federal and state waters (0-3 nm from shore). Many fishery resources are harvested in waters under both state and federal jurisdiction. As such, the Council and state work together to address habitat concerns, catch limits, allocation issues, and other management details through coordination meetings and delegation of management oversight to one agency or the other. In coastal waters off the United States, BSAI Atka mackerel and rockfish catch is under the jurisdiction of the BSAI Groundfish FMP, GOA Groundfish FMP, and the MSRA (NPFMC 2018a; 2018b; MSRA 2007). The jurisdictional category according to FCR SA4.1.1 is single jurisdiction.

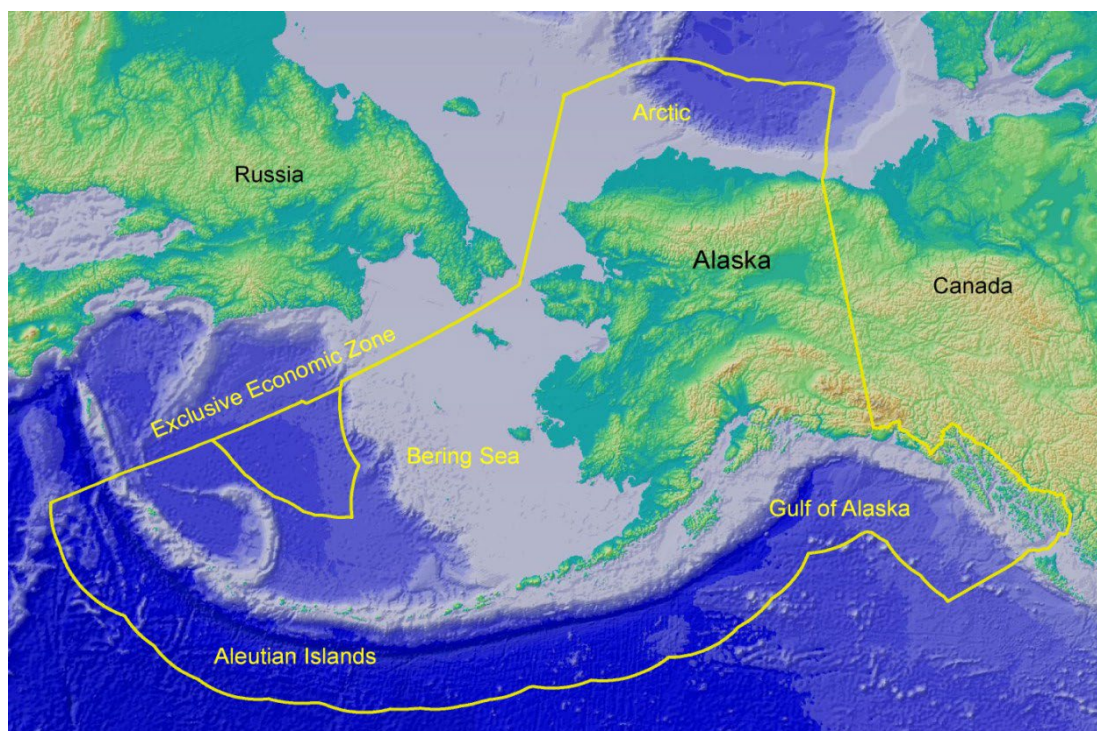


Figure 29. The U.S. EEZ of the BSAI and GOA. Source: NPFMC 2012

### 7.4.2 Recognized groups with interests in the fishery

Alaska Atka mackerel and rockfish are harvested by commercial demersal and pelagic trawl gear. The fleet consists of catcher vessels delivering to shore, catcher vessels delivering to motherships that process the catch, and at-sea CP vessels.

The Western Alaska CDQ Program was created by the Council in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of the high capital investment needed to enter the fishery (NPFMC 2019d). The CDQ Program allocates a percentage of all BSAI quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The purpose of the CDQ Program is to (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the BSAI Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide

economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska.

The Alaska Atka mackerel and rockfish management process has many stakeholders: Alaska Atka mackerel and rockfish license holders, processors, the states of Alaska, Washington, and Oregon, fishermen's organizations, CDQ groups, and several environmental groups.

### **7.4.3 Details of the consultation leading to the management plan**

In 1996, the United States Congress reauthorized the MSFCMA (creating the MSRA) to include a new emphasis on the precautionary approach in U.S. fishery management policy. The MSRA contains 10 national standards with which all FMPs must conform and which guide fishery management (NPFMC 2018a; 2018b).

These national standards are:

1. Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the U.S. fishing industry;
2. Conservation and management measures shall be based upon the best scientific information available;
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;
4. Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various U.S. fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonable calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of privileges;
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;
6. Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches;
7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication;
8. Conservation and management measures shall, consistent with the conservation requirements of the Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities;
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; and,
10. Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

Under the MSRA, the Council is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, an FMP and any necessary amendments, for each fishery under its authority that requires conservation and management. The Council conducts public hearings to allow all interested persons an opportunity to be heard in the development of FMPs and amendments, and reviews and revises, as appropriate, the assessments and specifications with respect to the OY from each fishery (NPFMC 2018a).

The groundfish fisheries, including Atka mackerel, Pacific Ocean perch, northern rockfish and dusky rockfish, in the BSAI and GOA are managed by two different, but complimentary, FMPs: BSAI FMP and GOA FMP. Program policies and measures are developed by the Council through the preparation and maintenance of FMPs for groundfish, crabs, and scallop fisheries in the BS and GOA, as well as for all future fisheries in the Arctic Ocean. The FMPs are frequently amended by the Council to respond to new scientific information, changes in the environment, changes in policy, and operational changes in the fisheries. The plan amendments, together with regulatory amendments, are developed through the Council's open and transparent regulatory process and implemented by the NMFS Alaska Regional Office (NPFMC 2018a; 2018b).

#### ***BSAI FMP***

The BSAI Groundfish FMP was adopted by the Council in 1980 and implemented in 1982. The FMP has been amended several times to meet the changing fishery management needs. The BSAI FMP management area is the U.S. EEZ of the BS and that portion of the North Pacific Ocean adjacent to the AI which is between 170°E longitude and the U.S.-Russian Convention Line of 1867 (NPFMC 2018). The BSAI FMP covers fisheries for all stocks of finfish and marine invertebrates except salmonoids, shrimps, scallops, snails, king crab, Tanner crab, Dungeness crab, corals, surf clams, horsehair crab, lyre crab, Pacific halibut, and Pacific herring (NPFMC 2018a). One of the major objectives of the Council in the early 1980s was to phase out foreign fishing vessel participation in the BSAI EEZ



(NPFMC 2016). The first ten amendments implemented in the BSAI Groundfish FMP specifically dealt with foreign fishing fleet participation in the fishery. After the foreign fleet was adequately addressed, the Council focused on managing and regulating the domestic fleet to allow for sustainable and profitable fisheries by limiting entry and addressing allocation issues, bycatch, and habitat conservation needs (NPFMC 2016). In recent years, the Council has adopted amendments to streamline catch share programs and address other science and management changes. The Council has prepared summaries of each amendment to the FMPs that provide an overview of the purpose and need, analysis, regulation, and results of each action, and are meant as a resource for anyone interested in understanding the development of a federal fishery management program in the North Pacific. A full list of these actions can be found at the following link: [BSAI Amendment Action Summaries](#).

#### GOA FMP

The GOA FMP was implemented on December 1, 1978 and has been amended over sixty times. The GOA FMP governs groundfish fisheries of the GOA. The FMP management area is the U.S. EEZ of the North Pacific Ocean, exclusive of the BS, between the eastern AI at 170° E W longitude and Dixon Entrance at 132° E 40' W longitude. The FMP covers fisheries for all stocks of finfish except salmon, steelhead, Pacific halibut, Pacific herring and tuna (NPFMC 2018b). The focus of the FMP has changed from the regulation of foreign fisheries to the management of fully domestic groundfish fisheries (NPFMC 2018b). The revised version has been updated to remove obsolete references to foreign fishery management measures, as well as outdated catch data and other scientific information. A full list of these amendments, similar to that prepared for the BSAI, can be found at the following link: [GOA Amendment Action Summaries](#).

### 7.4.4 Arrangements for on-going consultations with interest groups

The Council has established a wide-ranging consultation process. The process used by the Council to manage groundfish is described in a brochure explaining the overall Council process (NPFMC 2009) and the Council Operating Procedures (NPFMC 2012). The Council participates in international negotiations concerning any fishery matters under the cognizance of the Council. The Council also consults during preliminary discussions leading to U.S. positions on international fishery matters, including the allocation of fishery resources to other nations within its area of authority.

Each regular meeting and each emergency meeting are open to the public. Interested persons may present oral or written statements regarding the matters on the agenda at meetings, within reasonable limits established by the Chair. Current Council policy on oral testimony limits individuals to three minutes, and organizations to six minutes, per agenda item. All written information submitted to a Council by an interested person shall include a statement of the source and date of such information. Any oral or written statement shall include a brief description of the background and interests of the person in the subject of the oral or written statement (NPFMC 2009).

The Council may hold public hearings in order to provide the opportunity for all interested individuals to be heard with respect to the development of fishery management plans or amendments, and with respect to the administration and implementation of other relevant features of the MSRA. Notice of each hearing must be received by NMFS for publication in the *Federal Register* at least 23 calendar days prior to the proposed hearing. The Council will also issue notices to announce the time, location, and agenda for each hearing in a manner sufficient to assure all interested parties are aware of the opportunity to make their views known. If it is determined a hearing is appropriate, the Council Chair will designate at least one voting member of the Council to officiate. An accurate record of the participants and their views will be made available at the appropriate Council meeting and maintained as part of the Council's administrative record (NPFMC 2009).

The procedure for changing Federal fishing regulations follows a standardized process, set forth by a combination of laws, regulations, operational guidelines, policies, as well as adjustments and adaptations developed by the Council to increase efficiency, provide public participation, and produce quality outcomes (NPFMC 2009; 2012a). All documents are posted on the website in advance of the meeting, and public comment is taken by the Council and advisory bodies before any decisions are made. In addition, the Council website has newsletters, articles, publications, meeting agendas and calendars of upcoming events and highlights current issues.

The BOF has meeting schedules, calendars, recent actions and activities posted on the ADFG website. Stakeholders can also sign up for email notices to receive details on notices for meetings, regulation changes, proposals and other information from the BOF. An annual proposal book is available online, and hard copies are also available annually at the local Fish and Game offices beginning in late September (ADFG 2019b). There is also a Boards Support Coordinator in the various regions of Alaska that will provide assistance in writing and submitting a proposal for fishing regulations (ADFG 2019b).

### 7.4.5 Details of other non-MS-C fishery users or activities and arrangements for liaison

Fisheries for Atka mackerel primarily take place in federal waters of the EEZ; however, some harvest also occurs in state waters of the AI as a parallel fishery under the jurisdiction of the State of Alaska. For most federal groundfish fisheries ADFG issues emergency orders for state waters that duplicate NMFS management actions, however gear restrictions may vary. These emergency orders establish parallel fishing seasons, or “parallel fisheries”, which allow vessels to fish for groundfish (primarily Pacific cod, pollock and Atka mackerel) in state waters with the same seasons as the federal fisheries (ADFG 2019a). In other instances, the State of Alaska establishes “state waters” (or state-managed) fisheries with separate catch quotas and fishing seasons under state groundfish regulations. For the state fishery, which is managed by the state and open for directed fishing when the federal/parallel fishery is closed, the Guideline Harvest Level (GHL) is deducted from the area ABC before the TACs are set. For the parallel fishery, which is open concurrently with the federal fishery, catch is deducted directly from the area TAC (Jon McCracken, personal communication, September 17, 2019). Where there is both federal and parallel fisheries for a species, the state waters fishery usually will open after the parallel fishery closes (ADFG 2019a).

Most groundfish caught in the BSAI and GOA are caught commercially, but subsistence use is common as well. In the AI, nearly all communities are involved with the groundfish fishery, either at sea or onshore in fish processing facilities. Commercially rockfish, Atka mackerel and other species are harvested by both local and non-resident fishermen and processed in local facilities. Particularly abundant rockfish species in the area are usually caught near shore, including dusky rockfish. For subsistence purposes, the AI are divided into five management districts and managed by ADFG Division of Commercial Fisheries in the AI and a permit is required for certain species in specific areas (ADFG 2019a). There is also a recreational or sport fishery managed by ADFG, which has in place regulations and permits applicable to the different species and regions of Alaska (ADFG 2019a).

#### 7.4.6 Details of the decision-making process

The MSRA is the primary domestic legislation governing management of marine fisheries in the United States. The Act was first enacted in 1976 and has been amended many times over the years. It was most recently reauthorized in 2006. Two major recent sets of amendments to the law were the:

- The Sustainable Fisheries Act (1996) addresses many topics, among which includes Title V, *Implementation of Western and Central Pacific Fisheries Commission* ([http://www.nmfs.noaa.gov/sfa/sustainable\\_fisheries\\_act.pdf](http://www.nmfs.noaa.gov/sfa/sustainable_fisheries_act.pdf)).
- MSFCMA of 2006, which has numerous purposes (<http://www.nmfs.noaa.gov/msa2005/index.html>):
  - a. Acting to conserve fishery resources
  - b. Supporting enforcement of international fishing agreements
  - c. Promoting fishing in line with conservation principles
  - d. Providing for the implementation of FMPs which achieve optimal yield
  - e. Developing underutilized fisheries
  - f. Protecting EFHs
  - g. Additionally, the law calls for reducing bycatch and establishing fishery information monitoring systems.

The Council and NMFS manage U.S. federal fisheries off Alaska (3-200 nm). Management is coordinated, and in some cases, jointly managed, with the State of Alaska. NOAA and NMFS are also responsible for carrying out the U.S. policies to manage and conserve marine protected resources. Other applicable law that is directly relevant to the management of marine fisheries includes (NPFMC 2019a):

- NEPA: requires environmental impact assessments of federal actions and compliance with other laws and executive orders (EOs).
- ESA: prohibits actions that are expected to jeopardize the continued existence of any endangered or threatened species under NMFS’ jurisdiction or result in harmful effects on critical habitat.
- MMPA: requires protection of marine mammals. NMFS is responsible for whales, dolphins, porpoise, seals, sea lions and fur seals. USFWS is responsible for walrus, sea otters, and the West Indian manatee.
- Migratory Bird Treaty Act (MBTA): a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect migratory birds, prohibiting their taking, killing, or possession. The directed take of seabirds is prohibited.
- Coastal Zone Management Act: requires all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable
- Administrative Procedures Act: provides for public participation in the rulemaking process
- Paperwork Reduction Act: regulates the collection of information from the public

- Regulatory Flexibility Act: requires assessment of the regulatory impact on small entities through a regulatory flexibility analysis. The analysis is combined with the regulatory impact review and NEPA analyses.
- EO 12866 (Regulatory Planning and Review): establishes guidelines for promulgating new regulations and reviewing existing regulations and requires agencies to assess the costs and benefits of all regulatory action alternatives.
- EO 12898 (Environmental Justice): requires federal agencies to identify and address “disproportionately high adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations in the United States” as part of an environmental impact analysis associated with an action.
- EO 13175 (Consultation and Coordination with Indian Tribal Governments): requires regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications and the avoidance of unfunded mandates imposed on tribes.
- EO 13132 (Federalism): requires federal agencies to consider the implications of policies that may limit the scope of or pre-empt states’ legal authority. Such actions require a consultation process with the states and may not create unfunded mandates for the states.
- EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds): supplements the MBTA by requiring Federal agencies to work with the USFWS to develop memoranda of agreement to conserve migratory birds and to evaluate the effects of their actions on migratory birds in NEPA documents.

The Council makes recommendations to NMFS, and NMFS approves, implements, and enforces them. The Council consists of 11 voting members, including: 7 appointed members, 4 agency representatives (6 from AK, 3 from WA, 1 from OR, and 1 from NMFS). There are also 4 non-voting members that include representatives from the USFWS, U.S. Coast Guard (USCG), Pacific States Marine Fisheries Commission, and the U.S. Department of State. The Council meet 5 times per year, and each meeting is ~8 days. All meetings are open to the public. Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. There is also an SSC and Advisory Panel (AP) that provide input to Council at each meeting. Public testimony is taken on each agenda item, at the SSC, AP, and Council (NPFMC 2012b). The Council also maintains Plan Teams for each fishery management plan and appoints standing and ad hoc committees necessary to advise the Council on conservation and management issues.

## SSC

As required by the MSRA at Sec. 302(g)(1), the Council shall establish, maintain, and appoint the members of a SSC to assist it in the development, collection, and peer review of such statistical, biological, economic, social, and other scientific information as is relevant to the Council’s development and amendment of any of its fishery management plans (MRAG 2015). The SSC is composed of scientists in economics, biology, social science and statistics. Members appointed by the Council to the SSC shall be federal employees, state employees, academics, or independent experts and shall have strong scientific or technical credentials and experience. Independent experts on the SSC cannot be employed by an interest group or advocacy group. The SSC will provide the peer review process for scientific information used to advise the Council about the conservation and management of the fishery. The review process, which may include existing committees or panels, is deemed to satisfy the requirements of the guidelines issued pursuant to section 15 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106–554—Appendix C; 114 Stat. 2763A–153). SSC members serve one-year terms with no term limits. Members may be reappointed or replaced by the Council annually at their December Council meeting (NPFMC 2019c, MRAG 2015).

## AP

The AP is represented by members of the fishing industry, catching and processing and subsistence and commercial fishermen, observers, consumers, environmental/conservation, and sport fishermen. The Council relies on the AP for comprehensive advice on how various fishery management alternatives will affect the industry and local economies, on potential conflicts between user groups of a given fishery resource or area, and on the extent to which the United States will utilize resources managed by the Council’s fishery management plans (MRAG 2015). The AP consists of 22 members, usually serving three-year terms. These members may be reappointed or replaced by the Council annually at their December Council meeting (NPFMC 2019c).

## Groundfish Plan Teams

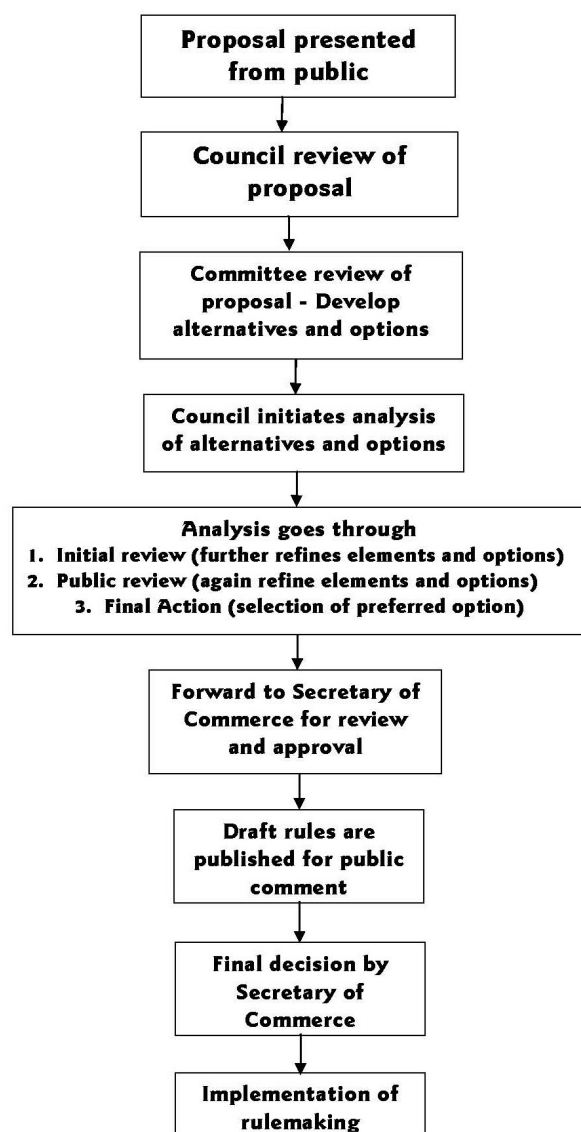
The Council appoints plan teams for each of the major FMPs. Members of each team are selected from those agencies and organizations having a role in the research and/or management of fisheries. At a minimum, teams shall be composed of one member from agencies having responsibility for management of the fishery resources under the jurisdiction of the Council. Nominations of these individuals are at the discretion of the agencies. Other individuals may

be nominated by members of the Plan Team, Council, SSC, or AP. Appointments to the team will be made by the Council with recommendations from the SSC.

The Plan Teams review stock assessment information and assist in the preparation of the annual SAFE documents including formulation of recommendations on annual ABC levels for groundfish, crab, and scallop species under jurisdiction of the Council. The Plan Teams may also prepare and/or review plans, amendments and supporting analytical documents for the Council, SSC, and AP; aggregate and evaluate public/industry proposals and comments; summarize and evaluate data related to the biological, economic and social conditions of the fishery; conduct and evaluate analyses pertaining to management of the fisheries; evaluate the effectiveness of management measures in achieving the plan's objectives; and recommend when and how management measures need to be changed.

Alaska Seafood Cooperative and other industry staff participates in the Plan Team process soliciting peer reviews of stock assessments, and its meetings consider outside views regarding its analyses. As a participant in the Plan Team process, a panel of biologists, from various state and federal agencies and recognized as having considerable expertise in the field of groundfish population dynamics are consulted on an annual basis to review the most recent groundfish survey information from the NMFS. If new data points for biomass estimates suggest a higher or lower ABC, then the outside experts have some input with assessment authors relative to adjusting these parameters. For those proposals, the Council chooses to pursue it directs NMFS and/or Council staff to prepare an analysis considering a range of alternatives. The Council reviews the analysis and selects a range of alternatives within which a preliminary preferred alternative may be identified. The analysis is then made available for public review, and the Council makes a final decision at the next meeting the item is scheduled. After considering Council recommendations and public comments, NMFS publishes the adopted regulations. For non-routine and annual management decisions, NMFS publishes a Federal Register notice and provides a public comment period before finalizing the recommendations (NPFMC 2009). The procedure for changing Federal fishing regulations follows a standardized process, set forth by a combination of laws, regulations, operational guidelines, policies, as well as adjustments and adaptations developed by the Council to increase efficiency, provide public participation, and produce quality outcomes (NPFMC 2009, 2012a). All documents are posted on the website in advance of the meeting, and public comment is taken by the Council and advisory bodies before any decisions are made.

**Proposal for Change.** Concerns and proposals for change are brought to the Council's attention by the public through the industry AP or other committee, or directly to the Council via written or verbal public comment during the 'Staff Tasking' agenda item at each Council meeting (Figure 30).



**Figure 30. Process for regulatory change within the Council. Source: NPFMC 2009**

**Discussion Paper.** A discussion paper is frequently prepared by staff as a first step to flesh out the scope of the problem identified and discuss issues that may be of concern in the development of alternatives. For very complex issues, several discussion papers may be necessary to explore the full scope of an issue before reasonable alternatives can be developed. For relatively simple changes, where the problem and alternatives are self-evident, a discussion paper may not be necessary, and the issue can go straight to analysis, even without developing an official problem statement and range of alternatives. The AP (and other committees if appropriate) provides recommendations to the Council at this stage regarding if the issue should proceed further in the process, if an expanded discussion paper is needed, or if the issue is ready for analysis (and recommend alternatives to be evaluated) (NPFMC 2009).

**Initial Review of Analysis.** Normally, the Council adopts a problem statement (or thoroughly describes the problem) and identifies alternatives to be considered, and then staff prepares a draft analysis that integrates analytical requirements of applicable laws and EOs. The analysis is released for review about two weeks (or more) before the meeting. The analysis is reviewed by the SSC for scientific merit, and by the AP to make recommendations regarding any missing information and the suite of alternatives and options evaluated. If the SSC has deemed the analysis inadequate and not ready for public review, or if the Council determines that additional alternatives or other substantial changes to the analysis are required, another initial review may be scheduled before the issue is scheduled for final action. If the analysis is to be released, the Council may designate a preliminary preferred alternative to focus comments on their indicated course of action (NPFMC 2009).

**Final Review of Analysis.** After initial review, staff revises the analysis based on SSC, AP, and the Council comments, and the analysis is posted on the Council website about 3-4 weeks before the meeting. The AP makes a

recommendation to the Council regarding a preferred alternative. The Council makes a final decision by roll call vote on the motion (NPFMC 2009).

**Proposed Rule.** The NMFS region prepares draft regulations based on Council action, and once cleared by the region and OMB, a proposed rule is published in the Federal Register. The public is provided time to comment on the proposed rule (NPFMC 2009).

**Final Rule.** NMFS region staff summarizes comments and may make adjustments to the rule based on these comments. The response to comments, the revised final rule, and final approval decision is published in the Federal Register (NPFMC 2009).

#### *Alaska BOF*

The BOF has jurisdiction over state waters fisheries (within 3 nm of the Alaska coastline). The BOF consists of seven members serving three-year terms. Members are appointed by the governor and confirmed by the legislature. Members are appointed on the basis of interest in public affairs, good judgment, knowledge, and ability in the field of action of the board, with a view to providing diversity of interest and points of view in the membership.

The BOF's main role is to conserve and develop the fishery resources of the state. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of the state's fishery resources. The board is charged with making allocative decisions, and the department is responsible for management based on those decisions (ADFG 2019b).

The BOF meets four to six times per year in communities around the state to consider proposed changes to fisheries regulations around the state. The board uses the biological and socioeconomic information provided by the ADFG, public comment received from people inside and outside of the state, and guidance from the Alaska Department of Public Safety and Alaska Department of Law when creating regulations that are sound and enforceable. The BOF is established under Alaska Statute 16.05.221 for the purposes of the conservation and development of the fisheries resources of the state. The BOF has the authority to adopt regulations described in AS 16.05.251 including: establishing open and closed seasons and areas for taking fish; setting quotas, bag limits, harvest levels and limitations for taking fish; and establishing the methods and means for the taking of fish.

The BOF conducts regular reviews of groundfish fisheries within state waters of Alaska, in which external parties (i.e., consultants contracted by various user groups, experts that department staff has asked for input, etc.) have full opportunity for critical comment. The Board's review of FMPs, amendments and other regulatory changes include input from ADFG staff, regional fish and game advisory committees, non-ADFG scientists, industry, environmental non-governmental organizations, stakeholders and the general public.

Legislative committees have conducted oversight and legislative hearings regarding the BOF's actions in a region's fisheries. The BOF and ADFG frequently turn to outside sources for technical advice, particularly regarding scientific matters and monitoring issues. If there are socio-economic or other ecosystem concerns expressed, the BOF can adjust time or area openings commensurate with the adjusted ABC. This process of external review is repeated in the BOF meeting schedule every three years (ADFG 2019b).

### **7.4.7 Objectives for the fishery**

The Council have several goals and objectives in both the BSAI FMP and the GOA FMP that have been established in order *"to apply judicious and responsible fisheries management practices, based on sound scientific research and analysis, proactively rather than re-actively, to ensure the sustainability of fishery resources and associated ecosystems for the benefit of future, as well as current generations"* (NPFMC 2019). The following objectives were taken directly from the BSAI and GOA FMPs (NPFMC 2018a, 2018b):

#### *Prevent Overfishing:*

- 1. Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield.*
- 2. Continue to use the 2 million mt optimum yield cap for the BSAI groundfish fisheries.*
- 3. Provide for adaptive management by continuing to specify optimum yield as a range.*
- 4. Provide for periodic reviews of the adequacy of F40 and adopt improvements, as appropriate.*
- 5. Continue to improve the management of species through species categories.*

*Promote Sustainable Fisheries and Communities:*

6. *Promote conservation while providing for optimum yield in terms of the greatest overall benefit to the nation with particular reference to food production, and sustainable opportunities for recreational, subsistence, and commercial fishing participants and fishing communities.*

7. *Promote management measures that, while meeting conservation objectives, are also designed to avoid significant disruption of existing social and economic structures.*

8. *Promote fair and equitable allocation of identified available resources in a manner such that no particular sector, group or entity acquires an excessive share of the privileges.*

9. *Promote increased safety at sea.*

*Preserve Food Web:*

10. *Develop indices of ecosystem health as targets for management.*

11. *Improve the procedure to adjust acceptable biological catch levels as necessary to account for uncertainty and ecosystem factors.*

12. *Continue to protect the integrity of the food web through limits on harvest of forage species.*

13. *Incorporate ecosystem-based considerations into fishery management decisions, as appropriate.*

*Manage Incidental Catch and Reduce Bycatch and Waste:*

14. *Continue and improve current incidental catch and bycatch management program.*

15. *Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.*

16. *Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.*

17. *Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.*

18. *Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.*

19. *Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and non-commercial species.*

20. *Control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures.*

21. *Reduce waste to biologically and socially acceptable levels.*

22. *Continue to improve the retention of groundfish where practicable, through establishment of minimum groundfish retention standards.*

*Avoid Impacts to Seabirds and Marine Mammals:*

23. *Continue to cooperate with U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species.*

24. *Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions.*

25. *Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.*

26. *Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.*

*Reduce and Avoid Impacts to Habitat:*

27. *Review and evaluate efficacy of existing habitat protection measures for managed species.*

28. *Identify and designate essential fish habitat and habitat areas of particular concern pursuant to Magnuson-Stevens Act rules, and mitigate fishery impacts as necessary and practicable to continue the sustainability of managed species.*



29. Develop a Marine Protected Area policy in coordination with national and state policies. 30. Encourage development of a research program to identify regional baseline habitat information and mapping, subject to funding and staff availability.

31. Develop goals, objectives and criteria to evaluate the efficacy and suitable design of marine protected areas and no-take marine reserves as tools to maintain abundance, diversity, and productivity. Implement marine protected areas if and where appropriate.

*Promote Equitable and Efficient Use of Fishery Resources:*

32. Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.

33. Maintain the license limitation program, modified as necessary, and further decrease excess fishing capacity and overcapitalization by eliminating latent licenses and extending programs such as community or rights-based management to some or all groundfish fisheries. 34. Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of access rights based on performance.

35. Develop management measures that, when practicable, consider the efficient use of fishery resources taking into account the interest of harvesters, processors, and communities.

*Increase Alaska Native Consultation:*

36. Continue to incorporate local and traditional knowledge in fishery management.

37. Consider ways to enhance collection of local and traditional knowledge from communities and incorporate such knowledge in fishery management where appropriate.

38. Increase Alaska Native participation and consultation in fishery management.

*Improve Data Quality, Monitoring and Enforcement:*

39. Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.

40. Develop funding mechanisms that achieve equitable costs to the industry for implementation of the North Pacific Groundfish Observer Program.

41. Improve community and regional economic impact costs and benefits through increased data reporting requirements.

42. Increase the quality of monitoring and enforcement data through improved technology.

43. Encourage a coordinated, long-term ecosystem monitoring program to collect baseline information and compile existing information from a variety of ongoing research initiatives, subject to funding and staff availability.

44. Cooperate with research institutions such as the North Pacific Research Board in identifying research needs to address pressing fishery issues.

*Promote enhanced enforceability.*

45. Continue to cooperate and coordinate management and enforcement programs with the Alaska Board of Fish, Alaska Department of Fish and Game, and Alaska Fish and Wildlife Protection, the U.S. Coast Guard, NMFS Enforcement, International Pacific Halibut Commission, Federal agencies, and other organizations to meet conservation requirements; promote economically healthy and sustainable fisheries and fishing communities; and maximize efficiencies in management and enforcement programs through continued consultation, coordination, and cooperation.

The state of Alaska states its regard for natural resources in its constitution. Article 8 lays out the framework for management of renewable resources (ADFG 2019b):

- **§ 2. General Authority** — The legislature shall provide for the utilization, development, and conservation of all natural resources belonging to the state, including land and waters, for the maximum benefit of the people.
- **§ 3. Common Use** — Wherever occurring in their natural state, fish, wildlife, and waters are reserved to the people for common use.
- **§ 4. Sustained Yield** — Fish, forests, wildlife, grasslands, and all other replenishable resources belong to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses.



- **§ 15. No Exclusive Right of Fishery** [as amended in 1972 to allow limited entry] — No exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State. This section does not restrict the power of the State to limit entry into any fishery for purposes of resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the state.

Because fish and wildlife were recognized as critically important, the ADFG was created as a cabinet level department run by a commissioner, who answers directly to the governor. ADFG states the mission of the Division of Commercial Fisheries is to “manage subsistence, commercial, and personal use fisheries in the interest of the economy and general well being of the citizens of the state, consistent with sustained yield principle, and subject to allocations through public regulatory processes.” In addition, the Core Services states a mission to “ensure the conservation of natural stocks of fish, shellfish and aquatic plants based on scientifically sound assessments” (ADFG 2019b).

#### 7.4.8 Rights of Access to the BSAI and GOA AK Groundfish fishery

##### *Atka mackerel*

Fisheries of Atka mackerel take place primarily in federal waters of the EEZ, although some harvest also occurs in state waters of the AI as a parallel fishery under the jurisdiction of the State of Alaska. A bycatch-only fishery for Atka mackerel is prosecuted in the GOA, with apparent targeting in the Central and Western GOA (ADFG 2005). After subtraction of the CDQ allowance, and incidental catch amount, up to 2% of the eastern AI and BS TACs will be allocated to vessels using jig gear, then the remaining TAC is apportioned among vessels using trawl gear (NPFMC 2018). The TAC for Atka mackerel is dispersed temporally and geographically to reduce possible adverse impacts of the fishery on endangered western Steller sea lion. Fishing effort in the Western and Central Aleutians is reduced by allowing only half of the fleet to fish one time within Steller sea lion habitat (ADFG 2005).

##### *Pacific Ocean perch and other rockfish fisheries*

For management purposes, rockfish in the BSAI and GOA are divided into management assemblages based on the habitats, distribution and habits. In the GOA, there are three groups of rockfish: demersal shelf rockfish, pelagic shelf rockfish, and slope rockfish. Dusky rockfish is considered a pelagic shelf rockfish, whereas Pacific Ocean perch and northern rockfish are considered slope rockfish. Pacific Ocean perch and northern rockfish were removed from the slope assemblage and placed in their own management categories to reduce the chance of overharvest (ADFG 2005).

As in the GOA, Pacific Ocean Perch constitute a single species management category in the BSAI (ADFG 2005). In the BSAI, Pacific Ocean perch's TAC is apportioned among vessels using trawl gear after the subtraction of the CDQ (NPFMC 2018). Comprising a separate management assemblage in the GOA, northern rockfish are included in an “other red rockfish” assemblage, although TACs are now set individually for each of the species (ADFG 2005). Demersal shelf rockfish are managed jointly by the ADFG and NMFS. The state manages rockfish (all species) in Prince William Sound and Cook Inlet. The Prince William Sound rockfish management plan includes three main components: 1) a 150, 000lb (68mt) annual harvest cap for all species, 2) bycatch allowance for low-level retention once the directed fishery is closed, and 3) vessel trip limits (ADFG 2005).

The fleet consists of catcher vessels delivering to shore, catcher vessels delivering to motherships that process the catch, and at-sea CP vessels. A federal groundfish license is required for catcher vessels (including CPs) participating in all BSAI and GOA groundfish fisheries, other than fixed gear sablefish. Licenses are endorsed with area, gear and vessel type and length designations. Exemptions for vessels fishing in State of Alaska waters (0-3 miles offshore) and vessels less than or equal to 26 length overall (LOA) in the GOA and 32 LOA in BSAI (NPFMC 2018a; 2018b).

For the state fishery, the GHL is deducted from the area ABC before the federal/parallel fishery TACs are set, and the State is responsible for enforcement. Mackerel, Pacific Ocean perch and rockfish are only managed by the federal authorities at this point since the State has not created a GHL fishery for these species (Jon McCracken, personal communication, September 17, 2019). For the parallel fisheries, the Federal authorities can only enforce federal vessels (vessels with a License Limitation Program [LLP] license), or a Federal Fisheries Permit (FFP) that are participating in the parallel fishery. The State can also provide enforcement for those federal vessels in the parallel fishery, but the State is responsible for enforcement of state vessels only (vessels without an LLP license or an FFP) (Jon McCracken, personal communication, September 17, 2019).

Fishing with trawl vessels is not permitted year-round in the Crab and Halibut Protection Zone and the Pribilof Island Habitat Conservation Area. Use of trawl gear is also prohibited at all times in the GOA's Southeast Outside district.

The Nearshore Bristol Bay Trawl Closure area is also closed year-round except for a subarea that remains open between April 1 and June 15 each year (NPFMC 2019a).

#### **7.4.9 Description of the measures agreed upon for the regulation of fishing in order to meet the objectives within a specified period**

The U.S measures for regulating the BSAI and GOA fisheries are found in [50 CFR 600](#) and [50 CFR 679](#).

Other applicable regulations for the BSAI and GOA groundfish fisheries are listed below with links to the most recent available data:

- [EFH 5-year review approach](#)
- [BSAI Harvest Specifications](#)
- [GOA Harvest Specifications](#)
- [Stellar Sea Lions Protection Measures](#)

##### *GOA Rockfish Program*

In 2003, the U.S. Congress directed the Secretary of Commerce, in consultation with the Council, a pilot program for management of the Northern rockfish, Pacific Ocean perch, and pelagic shelf rockfish fisheries in the Central GOA. In 2005, the Council adopted a share-based management program, under which the TAC is apportioned as exclusive shares to cooperatives (NPFMC 2019d). The Rockfish Program became effective in 2011 and fishing under it began in 2012. The rockfish fisheries are conducted in Federal waters near Kodiak, Alaska, by trawl and longline vessels. The Rockfish Program allocates harvest privileges to holders LLP groundfish licenses with a history of Central GOA rockfish legal landings in either 2000 through 2006, or the entry level trawl fishery in 2007, 2008, or 2009. The Rockfish Program assigns quota share to LLP licenses for rockfish primary and secondary species based on legal landings associated with that LLP. Primary rockfish species are northern rockfish, Pacific Ocean perch, and pelagic shelf rockfish. Secondary rockfish species are Pacific cod, roughey rockfish, shortraker rockfish, sablefish, and thornyhead rockfish. Each year, an LLP license holder assigns the LLP license with rockfish quota share to a rockfish cooperative. Each rockfish cooperative receives an annual cooperative fishing quota, which is an amount of primary and secondary rockfish species the cooperative is able to harvest in that fishing year. Halibut PSC is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving rockfish cooperative fishing quota must be located within the boundaries of the City of Kodiak. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year. An entry level fishery starts January 1 of each year for harvesters who are directed fishing for rockfish primary species using longline gear only. CP LLP license holders may opt-out of the Rockfish Program but are subject to certain sideboard limitations, which prevent rockfish eligible harvesters from increasing their participation in fisheries other than the Central GOA rockfish fisheries. The Council developed a replacement for the RPP that is scheduled to sunset on December 31, 2021 (NPFMC 2019e).

##### *AI FEP*

The Council developed the AI FEP as a pilot project in December of 2007. The AI FEP identified research priorities, ecosystem interactions, indicator status and data gaps for the AI. The ecosystem indicators have since been developed into an AI ecosystem assessment and are monitored on an annual basis as part of the Council's Ecosystem Considerations appendix to the Groundfish SAFE Report (NPFMC 2007).

##### *Amendment 80*

The Council implemented Amendment 80 in 2008, which allocated BSAI yellowfin sole, flathead sole, Atka mackerel, and AI Pacific Ocean perch to the "head and gut" trawl CP sector and allows qualified vessels to form cooperatives. This action meets the broad goals of: (1) improving retention and utilization of fishery resources by the non-AFA trawl CP fleet by extending the groundfish retention standard to non-AFA trawl CP vessels of all lengths; (2) allocating fishery resources among BSAI trawl harvesters in consideration of historic and present harvest patterns and future harvest needs; (3) authorizing the allocation of groundfish species to harvesting cooperatives and establishing a limited access privilege program for the non-AFA trawl CPs to reduce potential groundfish retention standard compliance costs, encourage fishing practices with lower discard rates, and improve the opportunity for increasing the value of harvested species; and (4) limiting the ability of non-AFA trawl CPs to expand their harvesting capacity into other fisheries not managed under a limited access privilege program. In addition, Amendment 80 modified the management of halibut and crab PSC limits (NPFMC 2018c). Northern and dusky rockfish are caught as part of the Amendment 80 fisheries that target Atka mackerel and POP. There is also a small allocation of these four species to the BSAI Trawl Limited Access sector, outside of Amendment 80.

### *Halibut PSC Reduction*

Since the implementation of Amendment 80 in 2008, the Alaska groundfish sector and the Council have, been working toward reducing the catch of halibut by the sector. The sector entered into a “Halibut Agreement” in 2016 to ensure a sector-wide accountability for halibut avoidance. The agreement consists of three components:

- **Best Practices** – The plan defines best operational practices for halibut avoidance for the Amendment 80 sector, including: monitoring halibut bycatch; communication protocols; excluder use and development; and halibut avoidance through changing a variety of fishing parameters, including location, target, depth, tow speed, and other factors.
- **Halibut Avoidance Plan** – The plan defines performance standards to incentivise all vessels in the fleet (through financial penalty) to achieve acceptable levels of halibut use in the fisheries. The program is intended to ensure that all vessels maintain minimum halibut rates annually using both annual and quarterly performance standards with a specific component to assess performance in the fourth quarter, when halibut rates have historically increased to the highest levels for the year.
- **Deck sorting** – The sector has spent several years developing a deck sorting program, which allows vessels to deck sort halibut to return halibut to the water quickly, thereby reducing halibut mortality. The sector is currently engaged in its fifth exempted fishing permit (EFP), allowing for continued development of deck sorting protocols that can be incorporated into a regulatory package in the future. Under these EFPs, the codend is pulled forward of the aft live tank hatches to allow space for sorting and is gradually emptied onto the deck. Crewmembers carefully remove halibut while moving the other fish into the tanks. The halibut are slid or carried to a station/table where the observer on duty is positioned. The observer’s table typically leads to a chute used to channel halibut off the vessel after counting and sampling. All observer tables must be pre-approved by NMFS prior to deck sorting and video monitoring is used in all locations where crew activities involving sorting and handling of halibut occur.

The 2018 EFP had the highest level of participation to date. A total of 21 vessels (including 2 vessels outside the Amendment 80 sector) participated this year, compared to nine in 2015, 12 in 2016, and 17 in 2017. The 2018 EFP also expanded to allow deck sorting of catch in the GOA. A large majority of flatfish catch was taken in the EFP. Vessels also increasingly used deck sorting in the Atka mackerel and Pacific Ocean perch fisheries. In sum, over 260,000 mt of groundfish were harvested in the 2018 EFP. The average halibut discard mortality rate in the 2018 EFP was approximately 49%, compared to the default discard mortality rate of 84% assigned to trawl CP vessels this year.

NMFS is developing a proposed regulatory amendment to implement voluntary halibut deck sorting on trawl CPs when operating in non-pollock groundfish fisheries off Alaska. The deck sorting analysis is being completed by NMFS and is in a draft Regulatory Impact Review stage, awaiting response to public comment (NPFMC 2019g).

In February 2018, The Council took final action to prohibit directed fishing by regulation for species with sideboard limits insufficient to support directed fishing for non-exempt AFA vessels and crab rationalization vessels. The Council also recommended removing the sideboard limit on AFA CPs for Central AI Atka mackerel because the sideboard limit under the AFA (11.5%) exceeds the allocation to the trawl limited access sector (10%), which was established by the Amendment 80 Program (NPFMC 2018d).

In December 2018, the Council adopted the BS FEP, which serves as a framework for a more formal approach for continued incorporation of ecosystem goals and actions in regional management. Five Action Modules were adopted, and the Council prioritized them:

1. Evaluate short-and long-term effects of climate change on fish and fisheries and develop management considerations – INITIATED.
2. Develop protocols for using local knowledge and traditional knowledge in management and understanding impacts of Council decisions on subsistence use – INITIATED
3. Gap analysis of BS management with EBFM best practices
4. Interdisciplinary conceptual models for the BS ecosystem
5. Align and track Council priorities with research funding opportunities.

The Council will periodically reconsider the list of Action Modules, their prioritization and which of them to initiate for action (BS FEP 2018).

Also, in December 2018, the Council reviewed and recommended for approval an EFP to develop an economically viable Aleutian Island (AI) pollock fishery. By allowing vessels under the proposed EFP to fish in a mixed target pollock fishery with its own Pacific Ocean Perch allocation of 500mt, rather than being restricted to the 5% aggregated rockfish maximum retainable amount limit, the EFP proposal will test an alternative management framework for limiting Pacific Ocean perch bycatch in the AI pollock fishery (NPFMC 2018e).

In February 2019, the Council conducted a comprehensive review of the Programmatic Groundfish Management Policy, highlighting activities relevant to priorities and objectives established by the Policy in 2018. It was determined by the Council that the policy continues to appropriately characterize management priorities and objectives and chose not to initiate any FMP amendments to modify the policy. For future reviews, the Council will continue to monitor actions relative to policy objectives through the programmatic workplan that is provided at every meeting. Comprehensive reviews of the policy will be done on a three-year cycle that aligns with the multi-year lifespan of major Council actions.

#### **7.4.10 Arrangements and responsibilities for monitoring, control and surveillance and enforcement**

The mission of the North Pacific Groundfish Observer Program is to collect data on fishing effort, total catch by species, and biological data; characterize marine mammal and sea bird interactions during the fisheries for Pacific cod. The MSFMCA and the MMPA authorize NMFS to place observers on Alaska groundfish vessels. The action is mandatory. The BSAI and GOA Groundfish FMPs (NPFMC 2018a, 2018b) requires that U.S. fishing vessels that catch groundfish in the EEZ, or receive groundfish caught in the EEZ, and shoreside processors that receive groundfish caught in the EEZ, are required to accommodate NMFS-certified observers as specified in regulations, in order to verify catch composition and quantity, including at-sea discards, and collect biological information on marine resources. In 2013, the Council and the NMFS restructured the Observer Program to place all vessels and processors in the groundfish and halibut fisheries off Alaska into one of two categories: (1) the full coverage category, where vessels and processors obtain observers by contracting directly with observer providers, and (2) the partial coverage category, where NMFS has the flexibility to deploy observers when and where they are needed based on an annual deployment plan (ADP). The purpose of restructuring the Observer Program was to: (1) reduce the potential for bias in observer data, (2) authorize the collection of observer data in fishing sectors that were previously not required to carry observers, (3) allow fishery managers to provide observer coverage to respond to the management needs and circumstances of individual fisheries, and (4) assess a broad-based fee to more equitably distribute the costs of observer coverage (NMFS 2013). Data collected from the Observer Program are stored and processed within the NMFS's Catch Accounting System, which produces annual reports available in SAFE reports of species or species complexes and online. The 2018 ADP documents how NMFS intends to assign at-sea and shoreside observers to operations fishing under the authority of the BSAI and GOA FMPs (NPFMC 2018a, 2018b).

Vessels and processors in the full coverage category have at least one observer present during all fishing or processing activity. Vessels and processors in the partial coverage category are assigned observer or EM based on the sampling plan described in the ADP (NPFMC 2019b). The selection rates as described in the 2018 ADP and programmed into the Observer Declare and Deploy System were as follows:

- No selection (zero coverage) – 0%;
- EM – 30%;
- Trawl (No Tender) – 20%;
- Hook-and-line – 17%;
- Pot (No Tender) – 16%;
- Tender trawl – 17%; and
- Tender pot – 17%.

Notable changes since the 2018 ADP include observer deployment on vessels in the partial coverage category for 2019 and the expansion of the EM selection pool. NMFS adopted the following stratification scheme with sample sizes allocated according to the 15% plus optimization based on discarded groundfish, Pacific halibut and Chinook salmon for the 2019 ADP:

- No selection – 0%;
- EM – 30%;
- Trawl – 24%;
- Hook-and-line – 18%;
- Pot – 15%;
- Tender trawl – 27%; and
- Tender pot – 16% (AFSC 2019).

EM deployment in 2019 continues to be funded through a combination of federal funding and other sources such as from the National Fish and Wildlife Foundation. NMFS placed 168 vessels in the EM selection pool (AFSC 2019).

The BSAI Atka mackerel, Pacific Ocean perch, and northern rockfish fishery is required to have full observer coverage when harvesting, receiving or processing groundfish in a federally managed or parallel groundfish fishery (FR Title 50; § 679.2). The federal regulations also have additional observer requirements for vessels classified as CPs and as CPs using trawl gear and groundfish CDQ fishing. Additionally, motherships that receive unsorted codends from catcher

vessels groundfish CDQ fishing must also have two observers aboard the mothership, at least one of whom must be endorsed as a lead level two observer (Federal Register Title 50; § 679.2). These additional observer requirements apply to the BSAI Atka mackerel, Pacific Ocean perch, and northern rockfish fishery.

All vessels participating in a parallel groundfish fishery, except those using jig or hand troll gear, must have a NMFS-approved VMS. According to the regional vessel monitoring information provided by NOAA, a vessel is required to use a VMS in Alaska when:

- *The vessel has a species and gear endorsement on its Federal Fisheries Permit for directed fishing for pollock, Pacific cod, or Atka mackerel and these fisheries are open, except if the vessel is using jig gear or danglebar gear (50 CFR 679.7(a)(18)).*
- *The vessel is operating in the Aleutian Islands or in adjacent State of Alaska waters (50 CFR 679.28(f)(6)).*
- *The vessel has non-pelagic trawl or dredge gear onboard in the Gulf of Alaska or in adjacent State of Alaska waters (50 CFR 679.28(f)(6)).*
- *The vessel is in federal reporting areas 610, 620, or 630, and receives and processes groundfish from other vessels (50 CFR 679.28(f)(6)).*
- *The vessel is participating in the Rockfish Program (50 CFR 679.7(n)(3)).*
- *The vessel is fishing for sablefish in the Bering Sea or Aleutian Islands (50 CFR 679.42(k)(2)).*
- *The vessel is participating in the Crab Rationalization Program (50 CFR 680.23(d)) (NOAA 2019b).*

If trawling in the AI, vessels are required to set their VMS to transmit the vessel location at least 10 times per hour (50 FR 679.28(f)(7)).

NMFS is responsible for funding and overall administration of the program including observer training, debriefing and data management. In the full observer coverage category, the fishing industry is responsible for making arrangements with contracting companies that meet the North Pacific Observer Program NMFS-certification requirements for placement of NMFS-trained observers aboard their vessels and paying contractors for direct observer costs. The observer contractors are responsible for observer recruiting, deployment, logistics, and insurance/benefits (NMFS 2014). Observer coverage responsibilities are shared among the fishing industry and independent observer contractors (who are certified by NMFS). The contractors hire and deploy observers. The NMFS also provides other observer support services (sampling gear and training documents) and is responsible for maintaining information systems for scientific and operational data, and administrative support. In the partial coverage category NMFS contracts directly with the observer providers, and charges fees to the industry for running the observer program based on ex-vessel value.

At-sea and shore-side enforcement is carried out by the Alaska Wildlife Troopers, NMFS Office of Law Enforcement (OLE), and the USCG. State and federal fisheries enforcement officers make use of USCG vessels and aircraft to assist in surveillance and enforcement.

At-sea and shore-side enforcement activities include:

- Monitoring of commercial fishing activities to ensure compliance with fishery laws and regulations;
- Actions to close commercial fisheries once catch limits have been reached;
- Educating participants in the fishery on the laws and regulations; NMFS management, NMFS OLE, and the USCG all conduct extensive outreach and education programs that seek not only to explain the regulations, but also to help the fishing industry understand the rationale for those regulations.
- Penalizing violators. OLE agents and officers can assess civil penalties directly to the violator in the form of a summary settlement or can refer the case to NOAA's OGC for Enforcement and Litigation who can impose a sanction on the vessels permit or further refer the case to the U.S. Attorney's Office for criminal proceedings. Penalties may range from severe monetary fines, boat seizure and/or imprisonment (NMFS 2011).

NOAA's OLE protects marine wildlife and habitat by enforcing domestic laws and international treaty requirements designed to ensure these global resources are available for future generations (NOAA 2019b). OLE special agents and enforcement officers ensure compliance with the nation's marine resource laws and take enforcement action when these laws are violated. All OLE work supports the core mission mandates of NMFS, maximizing productivity of sustainable fisheries and fishing communities and protection, recovery, and conservation of protected species. OLE in Alaska focuses on outreach to help prevent or minimize infractions.

The USCG serves as the primary agency for at- sea fisheries enforcement (USCG 2019). The USCG, in coordination with other federal and state agencies, enforces marine resource management and protection regimes to preserve healthy stocks of fish and other living marine resources. The USCG objectives are to prevent encroachment of the U.S. EEZ, ensure compliance with domestic fisheries regulations, and ensure compliance with international agreements. The USCG makes an annual report to the Council on resources applied to fishery enforcement in the previous year, including numbers of boardings. It also details numbers of violations by year, lives lost at sea, safety issues, and any changes in regulations. The USCG conducts a wide range of activities for

education and prevention; law enforcement; emergency response and containment; and disaster recovery. These activities lead to projecting federal law enforcement presence over the entire U.S. EEZ, covering nearly 3.4 million square miles of ocean; ensure compliance with fisheries and marine protected species regulations on domestic vessels; and preventing over-fishing, reducing mortality of protected species, and protecting marine habitats by enforcing domestic fishing laws and regulations. The Seventeenth Coast Guard District is responsible for the largest amount of coastline and one of the largest areas of responsibility within the Coast Guard. It is also home to one of the most productive fisheries in the world. The D17 Response Division is responsible for search and rescue, maritime law enforcement, and incident/pollution response within the Seventeenth District's area of responsibility (USCG 2019).

The primary responsibility for enforcing fish and wildlife-related statutes and regulations in Alaska lies with the Alaska Department of Public Safety, through its Division of Alaska Wildlife Troopers (ADFG 2019b). The division also enforces other types of regulations passed by the Board of Game and the BOF. This includes those designed to protect Alaska's native species from harmful invasive species, prevent importation of exotic pets, and prevent illegal export of animal parts from Alaska. Biologists and other staff of the ADFG sometimes participate in enforcement activities and assist the Wildlife Troopers as needed; however, law enforcement is not a primary function of ADFG (ADFG 2019b).

#### **7.4.11 Details of any planned education and training for interest groups**

The Council provides a range of opportunities for stakeholder education and input into management required by federal statute and implemented through its standard operating procedures (NPFMC 2012). Descriptions of stakeholder consultation procedures available on the Council website identify several elements of Council procedures that enable the distribution of information to stakeholders and the provision of public comment to management.

The Northern Bering Sea Research Area was implemented in 2008 and prohibited bottom trawling in the northern part of the BS. The objective of the Council was to develop a research plan that would provide better data to allow for increased understanding of the potential impacts of trawling on the benthic and epibenthic fauna of the northern BS before any commercial trawling was authorized (NPFMC 2019f). The Council requested that the AFSC develop a research plan and a discussion paper that compiles existing information on the Northern Bering Sea Research Area and review relevant data on the northern BS ecosystem (NPFMC 2019f).

The Council has signed a Memorandum of Understanding with 4 state agencies and 10 federal agencies to create the Alaska Marine Ecosystem Forum, which seeks to improve coordination and understanding between the agencies on issues of shared responsibilities related to the marine ecosystems off Alaska's coast. The purpose of the forum is to: promote information and dialogue exchange; improve agency coordination by sharing data and priorities; allow agencies to understand the ecosystem impact of other activities; and provide opportunities for joint work and problem solving (NPFMC 2019a). The Council also developed an AI FEP and a BS FEP. These plans are intended to be an educational tool and resource that can provide the Council with an ecosystem context for fishery management and policy decisions (NPFMC 2019a).

NOAA OLE outreach and education efforts facilitate sustainable and responsible use of marine resources. NOAA officers and agents visit communities throughout Alaska to deliver a message of resource protection. Several outreach efforts were conducted in the 2018 and 2019 years (NOAA 2019b).

#### **7.4.12 Dispute Resolution**

Legal disputes are handled under the Administrative Procedures Act, which governs the process by which federal agencies (e.g., NOAA, NMFS) develop and issue regulations. Opportunities are provided for the public to comment on notices of proposed rulemaking (<http://www.nmfs.noaa.gov/pr/pdfs/laws/apa.pdf>). NOAA has an extensive Dispute Resolution Process, defined by the Administrative Dispute Resolution Act of 1996, Pub. L. No. 104-320. The Council resolves disputes by majority vote as required in section 302 of the MSRA (IFC, 2014). All stakeholders have an opportunity for input prior to the decision by the Secretary of Commerce. Any disputes remaining following adoption of regulations/rules may be resolved through the federal court system. The MSRA requires discussions and decisions to take place in public sessions using publicly available information, which ensures transparency in the process (IFC 2014). In addition, the Council has an Alternative Dispute Resolution (ADR) process that consists of several approaches used to resolve conflict other than litigation if possible. The ADR process uses mediation, consultation and facilitated problem solving to resolve disputes in a confidential manner (NOAA 2019a).

#### **7.4.13 Date of next review and audit of the management plan**

The annual management cycle and activities related to groundfish, including BSAI and GOA Atka mackerel and rockfish, management contain extensive points of review detailed in the Council Operating Procedures (NPFMC 2012). These involve specific review of actions taken by the SSC and AP. Management measures are implemented annually with harvest specifications (ABCs and OYs) identified for each year. These actions are specified in detail in the Council Operating Procedures (NPFMC 2012).

#### 7.4.14 Principle 3 Performance Indicator scores and rationales

##### PI 3.1.1 – Legal and/or customary framework

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it:		
		<ul style="list-style-type: none"> <li>- Is capable of delivering sustainability in the UoA(s);</li> <li>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>- Incorporates an appropriate dispute resolution framework</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system <b>and a framework for cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and <b>organised and effective cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and <b>binding procedures governing cooperation with other parties</b> which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

Management of the Pacific Atka mackerel and rockfish fisheries is carried out under the authority of the federal MSFCMA, first passed in 1976 and most recently reauthorized in 2006. The MSRA is the principal law governing the harvest of fishery resources within the federal portion of the U.S. 200-mile zone. Under the MSRA, the Council recommends management actions to NMFS for approval. In addition to the MSA, the Council adheres to a suite of “other applicable laws:” NEPA, ESA, MMPA, MBTA, the Administrative Procedure Act, Paperwork Reduction Act, Regulatory Flexibility Act, and Coastal Zone Management Act and other relevant U.S. laws, EOs, and regulations. In addition, Alaska natives have rights that are taken into account in the management of the fishery, coordinated by NMFS.

Internationally, the Pacific Atka mackerel and rockfish fisheries are conducted in a manner consistent with provisions of the U.N. FAO Code of Conduct. The fishery is also governed by the U.S. High Seas Fishing Compliance Act of 1995. This federal legislation implements the U.N. Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas. The management of the fishery complies with the Migratory Bird Act Treaty, and the NMFS have instituted several regulations to further reduce seabird interactions in the fishery.

The Council relies on a consensus approach among advisory bodies with room for minority reports should these groups fail to reach consensus (NPFMC 2009). The Council resolves disputes (after weighing staff reports, advisory body reports, NMFS legal counsel advice, and public testimony) by majority vote held in public session as required in Section 302 of the MSRA. All stakeholders have an opportunity for input prior to the decision by the Secretary of Commerce. Legal action may also be used by those individuals or groups dissatisfied with the decisions made by the Council and NMFS through the federal court system.

The fishery has met the SG100 level for this scoring issue for all UoAs.

#### **b** Resolution of disputes



	Guide post	The management system incorporates or is subject by law to a <b>mechanism</b> for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution of legal disputes which is <b>considered to be effective</b> in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <b>tested and proven to be effective</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

Legal disputes are handled under the Administrative Procedures Act, which governs the process by which federal agencies (e.g., NOAA, NMFS) develop and issue regulations. Opportunities are provided for the public to comment on notices of proposed rulemaking (<http://www.nmfs.noaa.gov/pr/pdfs/laws/apa.pdf>). NOAA has an extensive Dispute Resolution Process, defined by the Administrative Dispute Resolution Act of 1996, Pub. L. No. 104-320. The Council resolves disputes by majority vote as required in section 302 of the MSRA. All stakeholders have an opportunity for input prior to the decision by the Secretary of Commerce. Any disputes remaining following adoption of regulations/rules may be resolved through the federal court system. The MSRA requires discussions and decisions to take place in public sessions using publicly available information, which ensures transparency in the process and is appropriate to the context of the fishery. In addition, the Council has an ADR process that consists of several approaches used to resolve conflict other than litigation if possible. The ADR process uses mediation, consultation and facilitated problem solving to resolve disputes in a confidential manner (NOAA 2019a).

The management system incorporates, and is subject by law, a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective. The SG100 level is met for this scoring issue for all UoAs.

Respect for rights				
<b>C</b>	Guide post	The management system has a mechanism to <b>generally respect</b> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <b>observe</b> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <b>formally commit</b> to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The MSRA states that “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 to provide for the sustained participation of such communities and to the extent practicable, minimize adverse economic impacts on such communities. The US management system has a mechanism to formally commit to the legal rights created explicitly for First Nations and Treaty Tribes. Federal agencies are required to consult with Alaska Native corporations on the same basis as Federally recognized Indian Tribes under EO 13175 (NOAA 2013). The relationship between Federally recognized Indian Tribes and the federal government is one of sovereign to sovereign and has been described at length by the federal judiciary and referred to in federal law promoting tribal self-determination and self-governance.

The Western Alaska CDQ Program was created by the Council to provide western Alaska communities to participate in the BSAI fisheries that have been foreclosed to them because of the high capital investment needed to enter the fishery. The CDQ Program allocates a percentage of all BSAI quotas for groundfish, halibut, crab and other prohibited species to eligible communities. The purpose of the CDQ Program is to 1) provide eligible western AK villages with the opportunity to participate and invest in fisheries in the BSAI Management Area; 2) alleviate poverty and provide



economic and social benefits for residents of western AK; and to achieve sustainable and diversified local economies in western Alaska (NPFMC 2019d).

The fishery has met the SG100 level for this scoring issue for all UoAs.

## References

NOAA 2019a; NOAA 2013; MSRA, 2007; UNCLOS, 1982, NPFMC 2009, NPFMC 2019d

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>N/A</b>

## PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>generally understood</b> .	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for key areas</b> of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for all areas</b> of responsibility and interaction.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The MSRA and amendments to the MSRA, in addition to other relevant Acts, mandate that the functions, roles and responsibilities are well understood and explicitly defined for key areas of responsibility and interaction. Under the MSRA, the Council recommends management actions to the NMFS for approval. Ultimate decision authority is placed with the Secretary of Commerce. Such measures are implemented by NMFS Alaska Regional office and enforced by the NOAA OLE, the USCG 17th District, and State of Alaska State Troopers. These management authorities are clearly defined in law and are functional.

The BOF as jurisdiction over state waters fisheries (within 3 nm of the Alaska coastline). The BOF consists of seven members serving three-year terms. Members are appointed by the governor and confirmed by the legislature. Members are appointed on the basis of interest in public affairs, good judgment, knowledge, and ability in the field of action of the board, with a view to providing diversity of interest and points of view in the membership. The BOF meets four to six times per year in communities around the state to consider proposed changes to fisheries regulations around the state.

The fishery has met the SG100 level for this scoring issue for all UoAs.

Consultation processes				
b	Guide post	The management system includes consultation processes that <b>obtain relevant information</b> from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information, including local knowledge. The management system demonstrates consideration of the information and <b>explains how it is used or not used</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

NOAA and NMFS have several processes that regularly seek and accept relevant information, including local knowledge. NMFS partners with federal agencies and federally recognized tribes to advise and collaborate on activities that might impact endangered and threatened species, marine mammals, and important marine habitats. NMFS has also developed a Public Consultation Tracking System, which is an information management system covering NMFS consultations under the ESA and under the MSFCMA sections 305(b)(2) & 305(b)(4) EFH.

Information is publicly available that explains how information and management decisions are made, consultations with the various agencies and inter-agency sectors, council representation, etc. The Council meets five times a year according to a pre-announced schedule. Notice of meetings is made through the Federal Register. Meeting agendas are widely distributed before each meeting and accessible on the Council website. Most Council meetings take eight days, with individual advisory body meetings occurring during the course of the week. All meetings are open to the public, except for a short-closed Council session in which the Council deals with in which the Council deals with personnel, administrative, or litigation issues.

The Alaska BOF uses the biological and socioeconomic information provided by the ADFG, public comment received from people inside and outside of the state, and guidance from the Alaska Department of Public Safety and Alaska Department of Law when creating regulations that are sound and enforceable. The BOF is established under Alaska Statute 16.05.221 for the purposes of the conservation and development of the fisheries resources of the state. The BOF has the authority to adopt regulations described in AS 16.05.251 including: establishing open and closed seasons and areas for taking fish; setting quotas, bag limits, harvest levels and limitations for taking fish; and establishing the methods and means for the taking of fish.

The BOF conducts regular reviews of groundfish fisheries within state waters of Alaska, in which external parties (i.e., consultants contracted by various user groups, experts that department staff has asked for input, etc.) have full opportunity for critical comment. The Board's review of FMPs, amendments and other regulatory changes include input from ADFG staff, regional fish and game advisory committees, non-ADFG scientists, industry, environmental non-governmental organizations, stakeholders and the general public.

Legislative committees have conducted oversight and legislative hearings regarding the BOF's actions in a region's fisheries. The BOF and ADFG frequently turn to outside sources for technical advice, particularly regarding scientific matters and monitoring issues. If there are socio-economic or other ecosystem concerns expressed, the BOF can adjust time or area openings commensurate with the adjusted ABC. This process of external review is repeated in the BOF meeting schedule every 3 years (ADFG 2019b).

The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.

The fishery has met the SG100 level for this scoring issue for all UoAs.

Participation				
<b>C</b>	Guide post		The consultation process <b>provides opportunity</b> for all interested and affected parties to be involved.	The consultation process provides <b>opportunity and encouragement</b> for all interested and affected parties to be involved, and <b>facilitates</b> their effective engagement.
	Met?		<b>Yes</b>	<b>Yes</b>
Rationale				

All meetings are open to the public and meeting information is available on the Council website. Dates and locations of Council meetings are publicized in advance. Several upcoming webinars are posted on the Council website, where interested parties can participate and receive information pertaining to Groundfish subcommittees, catch estimation methodology, EM, and various other ad hoc committees and subcommittees. The Council website also provides a manual called "Navigating the Council Process" explaining the fishery management process in nontechnical language.

There are several other procedures that promote the engagement of stakeholders, including consultation among agencies, universities and stakeholders on needed research and scientific information, public review and comment of data and analysis, public attendance and comment periods at advisory body meetings, representation on advisory bodies and the Council, Council newsletter, blogpost, twitter feed, public review periods for regulations and FMP amendments, agency responses to review comments, and opportunity for legal challenges to Council actions.

The BOF has meeting schedules, calendars, recent actions and activities posted on the ADFG website. Stakeholders can also sign up for email notices to receive details on notices for meetings, regulation changes, proposals and other information from the BOF. An annual proposal book is available online, and hard copies are also available annually at

the local Fish & Game offices beginning in late September (ADFG 2019a). There is also a Boards Support Coordinator in the various regions of Alaska that will provide assistance in writing and submitting a proposal for fishing regulations (ADFG 2019b).

The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement; and therefore, meets the SG100 level for this scoring issue for all UoAs.

## References

MSRA 2007, NPFMC 2019a; ADFG 2019a; ADFG 2019b

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	100
Condition number (if relevant)	N/A

## PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are <b>implicit</b> within management policy.	<b>Clear</b> long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are <b>explicit</b> within management policy.	<b>Clear</b> long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are <b>explicit</b> within <b>and required by</b> management policy.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The MSRA, National Standards and other legislation include explicit, well-defined short- and long-term objectives for sustainable fishing and conservation. NMFS incorporated precautionary concepts to ensure compliance with the Sustainable Fisheries Act 1996, which includes 10 National Standards for conservation and management of fisheries in the U.S. The Council have several goals and objectives in the BSAI and GOA FMPs that have been established in order to promote a stable planning environment for the seafood industry, including marine recreation events, while also maintaining the health of the resource and the environment (NPFMC 2018a; 2018b).

ADFG states the mission of the Division of Commercial Fisheries is to manage commercial, subsistence, and personal use fisheries in the interest of the economy and general well-being of the citizens of the state, consistent with the sustained yield principle, and subject to allocations through public regulatory processes. In addition, the Core Services states a mission to “ensure the conservation of natural stocks of fish, shellfish and aquatic plants based on scientifically sound assessments” (ADFG 2019b).

The fishery has met the SG100 level for this scoring issue for all UoAs.

## References

NPFMC 2018a; 2018b; UNCLOS, 1982; MSRA, 2007, ADFG 2019b

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>N/A</b>

## PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	<b>Objectives</b> , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>implicit</b> within the fishery-specific management system.	<b>Short and long-term objectives</b> , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>explicit</b> within the fishery-specific management system.	<b>Well defined and measurable short and long-term objectives</b> , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>explicit</b> within the fishery-specific management system.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

In addition to the National Standard Guidelines that provide objectives for federally managed fisheries, the Council has established nine specific objectives, each with several sub-objectives, for BSAI and GOA groundfish fisheries in Alaska:

- Prevent Overfishing;
- Promote Sustainable Fisheries and Communities;
- Preserve Food Web;
- Manage Incidental Catch and Reduce Bycatch and Waste;
- Avoid Impacts to Seabirds and Marine Mammals;
- Reduce and Avoid Impacts to Habitat;
- Promote Equitable and Efficient Use of Fishery Resources;
- Increase Alaska Native Consultation;
- Improve Data Quality, Monitoring and Enforcement.

The 45 sub-objectives substantially and explicitly support the outcomes of MSC Principles 1 and 2.

The state of Alaska states its regard for natural resources in its constitution. Article 8 lays out the framework for management of renewable resources (ADFG 2019b):

- **§ 2. General Authority** — *The legislature shall provide for the utilization, development, and conservation of all-natural resources belonging to the state, including land and waters, for the maximum benefit of the people.*
- **§ 3. Common Use** — *Wherever occurring in their natural state, fish, wildlife, and waters are reserved to the people for common use.*
- **§ 4. Sustained Yield** — *Fish, forests, wildlife, grasslands, and all other replenishable resources belong to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses.*
- **§ 15. No Exclusive Right of Fishery** [as amended in 1972 to allow limited entry] — *No exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State. This section does not restrict the power of the State to limit entry into any fishery for purposes of resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the state.*

Since these fisheries are primarily managed by NMFS, the short and long-term objectives which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 are explicit within the fishery-specific management system, meeting the SG 80 level for this scoring indicator. However, although the state's parallel fisheries mirror the federal fisheries in terms of seasons, closed areas, bycatch limits and legal gear types of the adjacent federal waters, it is unclear if the objectives for the federal fishery are also mirrored for the state component. Therefore, this fishery does not meet the SG 100 level for this scoring indicator of well-defined and measurable short and long-term objectives.

The fishery has met the SG100 level for this scoring issue for all UoAs.

## References

NPFMC 2018a, 2018b; ADFG 2019b

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>N/A</b>

## PI 3.2.2 – Decision-making processes

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are <b>some</b> decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are <b>established</b> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	<b>Yes</b>	<b>Yes</b>	
Rationale				

Decision-making for North Pacific groundfish occurs primarily within the Council process. However, NMFS; the states of Alaska, Washington, and Oregon; and numerous industry, academic, and NGO stakeholders participate in the process. The process used by the Council for decision-making is described in the guide for navigating the Council process (NPFMC 2009) and the Council Operating Procedures (NPFMC 2012a). The Council is the regional council responsible for managing North Pacific Ocean fisheries in the federal EEZ off the coast of Alaska (NPFMC 2009). The Council's geographic area of authority includes the EEZ of the Arctic Ocean and Pacific Ocean seaward of Alaska, including the BSAI and GOA.

The BOF as jurisdiction over state waters fisheries (within 3 nm of the Alaska coastline). The BOF consists of seven members serving three-year terms. Members are appointed by the governor and confirmed by the legislature. Members are appointed on the basis of interest in public affairs, good judgment, knowledge, and ability in the field of action of the board, with a view to providing diversity of interest and points of view in the membership. The BOF's main role is to conserve and develop the fishery resources of the state. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of the state's fishery resources. The board is charged with making allocative decisions, and the department is responsible for management based on those decisions (ADFG 2019a).

The fishery meets the SG80 level for this scoring issue for all UoAs.

Responsiveness of decision-making processes				
b	Guide post	Decision-making processes respond to <b>serious issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to <b>serious and other important issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to <b>all issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

Within the Council, decision-making processes are designed by law and practice to be responsive to issues raised from a number of sources. Processes are transparent, timely and adaptive to wider circumstances. The Council and its groundfish advisory bodies meet five times a year. Between meetings, committees composed of stakeholders, scientists and managers hold public meeting to consider specific problems and to evaluate management programs,



developing recommendations for Council action. The BSAI and GOA FMPs state: *The Council will maintain a continuing review of the fisheries managed under this FMP through the following methods: 1. Maintain close liaison with the management agencies involved, usually the Alaska Department of Fish and Game and NMFS, to monitor the development of the fisheries and the activity in the fisheries. 2. Promote research to increase their knowledge of the fishery and the resource, either through Council funding or by recommending research projects to other agencies. 3. Conduct public hearings at appropriate times and in appropriate locations to hear testimony on the effectiveness of the management plans and requests for changes. 4. Consider all information gained from the above activities and develop, if necessary, amendments to the FMP. The Council will also hold public hearings on proposed amendments prior to forwarding them to the Secretary for possible adoption.*

Annually, the Council develops harvest specifications based on information from the SSC, AP, Groundfish plan teams, the public, and any other relevant information (NPFMC 2019a). In addition, the Guidelines for FMPs published by NMFS require that a SAFE report be prepared and reviewed annually for each FMP. Final harvest specifications are implemented by mid-February each year to replace those already in effect for the current year and based on new information contained in the latest SAFE reports (NPFMC 2019a).

Decision-making processes are evident, at both the state and federal levels, that respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions, thus, meeting the SG 80 level. It is less clear, however, if these decision-making processes respond to all issues that are identified in relevant research, monitoring, evaluation and consultation, and therefore do not meet the SG 100 level for this scoring indicator.

The scoring level 80 is met for this scoring issue for all UoAs, but the SG100 level is not met.

Use of precautionary approach				
<b>C</b>	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		<b>Yes</b>	
Rationale				

The Council management approach has incorporated forward looking conservation measures that address differing levels of uncertainty. This management approach has been labelled the precautionary approach. "Recognizing that potential changes in productivity may be caused by fluctuations in natural oceanographic conditions, fisheries, and other, non-fishing activities, the Council intends to continue to take appropriate measures to insure the continued sustainability of the managed species" (NPFMC 2018a, 2018b).

ADFG states the mission of the Division of Commercial Fisheries is to "manage subsistence, commercial, and personal use fisheries in the interest of the economy and general well-being of the citizens of the state, consistent with sustained yield principle, and subject to allocations through public regulatory processes. In addition, the Core Services states a mission to ensure the conservation of natural stocks of fish, shellfish and aquatic plants based on scientifically sound assessments" (ADFG 2019b).

The scoring level 80 is met for this scoring issue for all UoAs.

Accountability and transparency of management system and decision-making process				
<b>d</b>	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	<b>Information on the fishery's performance and management action is available on request</b> , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders <b>provides comprehensive information on the fishery's performance and management actions</b> and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and

				review activity.
	Met?	Yes	Yes	Yes

### Rationale

At the federal level, the Council is required to create a record of decisions. Actions taken by the Council are recommendations to the Secretary of Commerce who holds the ultimate decision authority but, in most instances, delegates this authority to the NMFS or NOAA Fisheries level. A formal rulemaking process is conducted under which federal regulations are issued as proposed rules subject to public comment. Responses to stakeholder comments are included in the final rule.

Stakeholders also receive comprehensive reporting on management actions through live blogs of Council meetings, meeting minutes and the Council newsletter. At the state level, the BOF receives written proposals, comments and oral and written testimony from local fish and game advisory committees, ADFG and the public. BOF meetings are open to the public and provide opportunity for public comment. There are also advisory committees that listen and discuss local concerns about fishing regulations, and then submit proposed regulation changes to the BOF. Newsletters, announcements, meeting minutes and future scheduled events are also available on the ADFG website or by subscribing to ADFG commercial fisheries' updates (ADFG 2019a).

SG100 is met for this scoring issue for all UoAs.

Approach to disputes				
e	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Yes	Yes	Yes
Rationale				

Legal disputes are handled under the Administrative Procedures Act, which governs the process by which federal agencies (e.g., NOAA, NMFS) develop and issue regulations. Opportunities are provided for the public to comment on notices of proposed rulemaking (<http://www.nmfs.noaa.gov/pr/pdfs/laws/apa.pdf>). NOAA has an extensive Dispute Resolution Process, defined by the Administrative Dispute Resolution Act of 1996, Pub. L. No. 104-320. The Council resolves disputes by majority vote as required in section 302 of the MSRA. All stakeholders have an opportunity for input prior to the decision by the Secretary of Commerce. Any disputes remaining following adoption of regulations/rules may be resolved through the federal court system. The MSRA requires discussions and decisions to take place in public sessions using publicly available information, which ensures transparency in the process. In addition, the Council has an ADR process that consists of several approaches used to resolve conflict other than litigation if possible. The ADR process uses mediation, consultation and facilitated problem solving to resolve disputes in a confidential manner (NOAA 2019a.).

The Council conducts its ongoing decision processes in a manner designed to avoid legal disputes. It places a heavy emphasis on the use of advisory committees and stakeholder input as new regulations or programs are developed so that differences are resolved in the design stage. In addition, the wide dissemination of information to promote transparency ensures that the probability of stakeholders being caught off-guard is minimal.

A score of 100 is awarded for this scoring issue for all UoAs.

### References

NPFMC 2009, 2012a, 2018a; 2018b, 2019a; NOAA 2019a; ADFG 2019a; b

**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>95</b>
Condition number (if relevant)	<b>N/A</b>

## PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	<b>MCS implementation</b>			
	Guide post	Monitoring, control and surveillance <b>mechanisms</b> exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance <b>system</b> has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A <b>comprehensive</b> monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

Under the Federal North Pacific Groundfish Observer Program a comprehensive monitoring, control and surveillance system has been implemented. All the UoAs' vessels are required to carry observers as requested, and most carry two observers at all times to collect data on fishing effort, total catch by species, and biological data; characterize marine mammal and sea bird interactions. Vessels carry VMS to monitor location. At-sea and shore-side enforcement is carried out by the Alaska State Troopers, NMFS OLE, and the USCG (NOAA 2019b; USCG 2019).

Monitoring, control and surveillance actions include:

- Fishing permit requirements
- Fishing permit and fishing vessel registers
- Vessel and gear marking requirements
- Fishing gear and method restrictions
- Reporting requirements for catch, effort, and catch disposition
- Vessel inspections
- Record keeping requirements
- Auditing of licensed fish buyers
- Control of transshipment
- Monitored unloads of fish
- Information management and intelligence analysis
- Analysis of catch and effort reporting and comparison with landing and trade data to confirm accuracy
- Boarding and inspection by fishery officers at sea
- Aerial and surface surveillance

All vessels participating in a parallel groundfish fishery, except those using jig or hand troll gear, must have a NMFS-approved VMS (NOAA 2019c).

At-sea and shore-side enforcement is carried out by the Alaska Wildlife Troopers, NMFS OLE, and USCG. State and federal fisheries enforcement officers make use of USCG vessels and aircraft to assist in surveillance and enforcement.

At-sea and shore-side enforcement activities include:

- Monitoring of commercial fishing activities to ensure compliance with fishery laws and regulations;
- Actions to close commercial fisheries once catch limits have been reached;

- Educating participants in the fishery on the laws and regulations; NMFS management, NMFS OLE, and the USCG all conduct extensive outreach and education programs that seek not only to explain the regulations, but also to help the fishing industry understand the rationale for those regulations.
- Penalizing violators. OLE agents and officers can assess civil penalties directly to the violator in the form of a summary settlement or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation who can impose a sanction on the vessels permit or further refer the case to the U.S. Attorney's Office for criminal proceedings. Penalties may range from severe monetary fines, boat seizure and/or imprisonment (NMFS 2011).

The SG100 level is met for this scoring issue for all UoAs.

Sanctions				
<b>b</b>	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, <b>are consistently applied</b> and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and <b>demonstrably</b> provide effective deterrence.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

Penalties for fisheries related violations include fines; forfeiture of fish, vessels, other property and quota; and imprisonment. With respect to permit sanctions, where applicable, the statutes that NOAA enforces generally provide broad authority to suspend or revoke permits.

The SG100 level is met for this scoring issue for all UoAs.

Compliance				
<b>c</b>	Guide post	Fishers are <b>generally thought</b> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	<b>Some evidence exists</b> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a <b>high degree of confidence</b> that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

Officers and agents in the NOAA OLE, the USCG, Customs and Border Protection, Immigration and Customs Enforcement, USFWS, monitor compliance and investigate potential violations of the statutes and regulations enforced by NOAA. The Cooperative Enforcement Agreements and Joint Enforcement Agreements also in place authorize state and U.S. territorial marine conservation law enforcement officers to enforce federal laws and regulations. These agreements also include a formal operations plan that transfers funds to perform enforcement services that are in support of Federal Regulations (NOAA 2019b). For the parallel fisheries, the Federal authorities can only enforce federal vessels (vessels with an LLP license), or an FFP that are participating in the parallel fishery. The State can also provide enforcement for those federal vessels in the parallel fishery, but the State is responsible for enforcement of state vessels only (vessels without an LLP license or an FFP) (Jon McCracken, personal communication, September 17, 2019).

According to the 17<sup>th</sup> Coast Guard District Enforcement Report, there were 164 domestic fisheries and fishing vessel safety boardings conducted by the USCG during the 2018-2019 reporting period. Of these boardings, only 2 fisheries violations were reported and 21 safety violations onboard 13 vessels (USCG 2019). The June 2019 NOAA Enforcement Report showed there were 30 settlements issued for bycatch and groundfish overage, however there was no evidence presented that these violations occurred for the UoAs.

Interviews with Alaska Wildlife Troopers reported no violations for this fishery.

The fishery meets the SG 100 level for this scoring issue for all UoAs.

Systematic non-compliance			
<b>d</b>	Guide post		There is no evidence of systematic non-compliance.
	Met?		<b>Yes</b>

#### Rationale

To the team's knowledge, no evidence of systematic non-compliance exists in these fisheries. The SG80 level is met for all UoAs for this scoring issue.

#### References

NOAA 2019a, 2019d USCG 2014; NMFS 2011

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>60-75</b>
Information gap indicator	<b>More information sought to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>N/A</b>

## PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate <b>some</b> parts of the fishery-specific management system.	There are mechanisms in place to evaluate <b>key</b> parts of the fishery-specific management system.	There are mechanisms in place to evaluate <b>all</b> parts of the fishery-specific management system.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The Council meets five times a year and has mechanisms in place to evaluate all parts of the management system. The annual management process is detailed in Council Operating Procedure (NPFMC 2009, 2012a). Under the annual cycle, eligible management measures are put into place and adjusted through routine in-season evaluation and actions. The comprehensive amendments to the fishery management plan, averaging about two per year since the implementation of the council system, demonstrate the wide range of management topics evaluated by the Council. Congress reviews the MSA every five years and amends it as necessary.

The BOF meets four to six times per year in communities around the state to consider proposed changes to fisheries regulations around the state. The board uses the biological and socioeconomic information provided by the ADFG, public comment received from people inside and outside of the state, and guidance from the Alaska Department of Public Safety and Alaska Department of Law when creating regulations that are sound and enforceable. The BOF conducts regular reviews of groundfish fisheries within state waters of Alaska, in which external parties (i.e., consultants contracted by various user groups, experts that department staff has asked for input, etc.) have full opportunity for critical comment. The Board's review of FMPs, amendments and other regulatory changes include input from ADFG staff, regional fish and game advisory committees, non-ADFG scientists, industry, environmental non-governmental organizations, stakeholders and the general public.

The SG100 level is met for all UoAs for this scoring issue.

Internal and/or external review				
<b>b</b>	Guide post	The fishery-specific management system is subject to <b>occasional internal</b> review.	The fishery-specific management system is subject to <b>regular internal</b> and <b>occasional external</b> review.	The fishery-specific management system is subject to <b>regular internal and external</b> review.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The Council management system undergoes extensive internal review as part of the annual harvest specification process (see SI a). All aspects are available for review through the AP, SSC, public comment, and Council member discussions. All Council recommendations are externally reviewed by NMFS, NOAA, and the Department of Commerce.

The AFSC regularly requests independent external reviews of a sub-set of assessments. External reviews are usually conducted through the Center of Independent Experts, which periodically reviews the Alaska management and stock assessments. The reviewer's comments and the Assessment Author's responses (if any) are provided to the Plan Teams and SSC for their information and consideration. Further external review occurs through occasional legal challenges, which refine understanding of requirements under laws and regulations.

Legislative committees have conducted oversight and legislative hearings regarding the BOF's actions in a region's fisheries. The BOF and ADFG frequently turn to outside sources for technical advice, particularly regarding scientific

matters and monitoring issues. If there are socio-economic or other ecosystem concerns expressed, the BOF can adjust time or area openings commensurate with the adjusted ABC. This process of external review is repeated in the BOF meeting schedule every 3 years (ADFG 2019a; 2019b).

The SG100 level is met for all UoAs for this scoring issue.

## References

NPFMC 2009, 2012a; ADFG2019a; 2019b

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	100
Condition number (if relevant)	N/A



## 5.5 References

### Principle 1 References

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## 5.6 Evaluation processes and techniques

### 5.6.1 Site visits

The assessment process as defined in the MSC Fishery Certification Process version 2.1 was followed in this audit.

Information supplied by the clients and management agencies was reviewed by the assessment team ahead of the onsite meeting, and discussions with the clients and management agencies centred on the content within the provided documentation. In cases where relevant documentation was not provided in advance of the meeting, it was requested by the assessment team and subsequently supplied during, or shortly after the meeting.

Thirty days prior to the audit site visit, all stakeholders from the full assessment were informed of the visit and the opportunity to provide information to the auditors in advance of, or during, the site visit. The site visit was held partly at the offices of At-Sea Processors and at AFSC in Seattle, WA, June 17<sup>th</sup> – June 19<sup>th</sup>. Stakeholders attended either in person or via teleconference.

The following participants were in attendance:

Name	Affiliation
Erin Wilson	MRAG Americas
Paul Knapman	MRAG Americas and DNV assessment team member
Don Bowen	MRAG Americas assessment team member
Jake Rice	DFO Emeritus, MRAG Americas assessment team member
Jodi Bostrom	MRAG Americas assessment team member
Amanda Stern-Pirlot	MRAG Americas
Michealene Corlett	MRAG Americas
Giuseppe Scarcella	MRAG Americas and DNV assessment team member
Anna Kiselva	DNV GI
Miki Takada	Marine Stewardship Council (MSC)
Gonzalo Banda	MSC
Eileen Ekstrom	ANSI Technical Assessors
Austin Estabrooks	At-Sea Processors Association
Mark Fina	Alaska Seafood Cooperative
Christopher Oliver	Alaska Seafood Cooperative
Dave Gaudet	Alaska Fisheries Development Foundation (AFDF)
Riley Smith	AFDF
Matt Tinning	At Sea Processors Association
Julie Decker	AFDF (teleconference)
Susan Robinson	Ocean Peace Inc.
Nicole Kimball	Pacific Seafood Processors Association (teleconference)
Mark Stichert	Groundfish/Shellfish Fisheries Management Coordinator, Alaska Department of Fish and Game (ADFG), (teleconference)
Forrest Bowers	ADFG (teleconference)
Miranda Westphal	ADFG (teleconference)
Asia Beder	ADFG (teleconference)
Jim Ianelli	Alaska Fisheries Science Center (AFSC)
Steve Barbeaux	AFSC
Martin Dorn	AFSC
Meaghan Bryan	AFSC
Thomas Wilderbuer	AFSC
Sandra Lowe	AFSC
Chris Wilson	AFSC
Martin Dorn	AFSC
Grant Thompson	AFSC (teleconference)
Pete Hulson	AFSC (teleconference)
Jeremy Sterling	AFSC
Brian Fadely	AFSC
Shannon Fitzgerald	NMFS/AFSC
Kerim Aydin	AFSC
Ed Melvin	AFSC
Kirsten Holsman	AFSC
Elizabeth Siddon	AFSC
Jennifer Ferdinand	AFSC
Lieutenant Jonathan Streifel	Alaska Wildlife Troopers ( teleconference)
Julie Bonney	Alaska Fisheries Databank (teleconference)

The following is a summary of the agenda for the site visit:

Alaska Responsible Fisheries Management & Marine Stewardship Council

# **Site Visit Agenda/Audit June 17 – 19th**

**Monday, June 17<sup>th</sup>, 2019**

## **Location:**

At-Sea Processors Association  
4039 21st Ave West Suite 400  
Seattle, WA 98199

Time	Topic	MSC Team members	RFM Team members	Interviewees
8:30-9:00	General opening meeting with all clients and both programs to go over the agenda and logistics for the visit. MSC Agenda Items: <ul style="list-style-type: none"> <li>Objectives/Introductions</li> <li>Overview of the assessment process, changes with the FCP</li> </ul> RFM assessment team and their opening meeting	EW, GS, JB, PK (JR, WDB, ASP, MC)	AK, GS, JB, PK	Chris Oliver, Austin Estabrooks, Mark Fina, Dave Gaudet, Julie Decker, Riley Smith
9:00-10:30	Flatfish, rockfish, Atka mackerel client meeting: <ul style="list-style-type: none"> <li>Review of general info about the client group</li> <li>Review of fishing operations:</li> <li>Review of impacts on the ecosystem</li> </ul>	EW, GS, JB, PK (JR, WDB, ASP, MC)	AK, GS, JB, PK	Chris Oliver, Mark Fina
10:30–10:45	Break			
10:45-12pm	Flatfish/Mackerel, POP and Rockfish Continued <ul style="list-style-type: none"> <li>Review of management practices</li> </ul>			
12-1pm	Lunch	All	All	Austin, Chris, Mark, Dave
1-2pm	Pollock opening meeting <ul style="list-style-type: none"> <li>Review agenda and ensure content for P1, P2 and P3 has been gathered, meetings arranged, etc.</li> <li>Confirm traceability for fisheries</li> <li>Review current certificates</li> <li>Review any changes, new developments</li> </ul>	EW, JR, WDB, PK (ASP, GS, JB, MC)	N/A	Austin Estabrooks, Ruth Christiansen, Nicole Kimball
2:00	Meeting with cod complainant	EW, JR, WDB, PK (ASP, GS, JB, MC)	N/A	Complainant and only the MSC assessment team
3:00 - 4:00	Cod opening meeting <ul style="list-style-type: none"> <li>Review agenda and ensure content for P1, P2 and P3 has been gathered, meetings arranged, etc.</li> <li>Confirm traceability for fisheries</li> <li>Review current certificates</li> <li>Review any changes, new developments</li> </ul>	EW, JR, WDB, PK (ASP, GS, JB, MC)	N/A	Dave Gaudet, Julie Decker, Chad See, Nicole Kimball
4:00-5:00	<ul style="list-style-type: none"> <li>Management Review, changes in regulations, management plan, enforcement, monitoring, etc.</li> </ul>	EW, PK		ADF&G: Forrest Bowers
	End Day 1			

**Tuesday, June 18<sup>th</sup>, 2019**

## **Location:**

Alaska Fishery Science Center  
7600 Sand Point Way N.E., Building 4  
Seattle, WA 98115  
Traynor Room 2079



Time	Topic	MSC Team members	RFM Team members	Interviewees
9:00 am	Introductions, review agenda			
9:10-10:15	2018 Stock assessments overview of BSAI and GOA pollock	JR, WDB, PK, EW (GS)	N/A	Pollock assessments EBS pollock – <u>Jim Ianelli</u> AI Pollock – <u>Steve Barbeaux</u> GOA Pollock – <u>Martin Dorn</u>
10:15-11:15	EBS, AI, and GOA Pacific cod (same as above)	JR, WDB, PK, EW (GS)	N/A	Pacific cod assessments EBS and AI Pacific cod – <u>Grant Thompson</u> <i>teleconference</i> GOA Pacific cod – <u>Steve Barbeaux</u>
11:15-12	BSAI Atka mackerel (same as above)	JR, WDB, PK, EW (GS)	AK, GS, JB, PK	BSAI Atka mackerel – <u>Sandra Lowe</u>
1:30-2:30	2018 Stock assessments overview of BSAI and GOA flatfish stocks (same as above)	GS, JB, PK, EW	GS, JB, PK, AK	BSAI Kamchatka flounder, Greenland turbot – <u>Meaghan Bryan</u> GOA N & S rock sole – <u>Meaghan Bryan</u> BSAI northern rock sole – <u>Tom Wilderbuer</u> Yellowfin sole – <u>Tom Wilderbuer</u> BSAI Alaska plaice – <u>Tom Wilderbuer</u>
3:00	BREAK			
3:15	2018 Stock assessments overview of BSAI and GOA flatfish stocks continued...			BSAI and GOA Arrowtooth flounder assessments – <u>Tom Wilderbuer</u>
4:00	2018 Stock assessments overview of BSAI and GOA rockfish stocks (same as above)	JR, WDB, PK, EW (GS)	AK, GS, JB, PK	BSAI northern rockfish – <u>Paul Spencer</u> GOA northern rockfish – <u>Pete Hulson</u> <i>teleconference</i>  BSAI POP – <u>Paul Spencer</u> GOA POP – <u>Pete Hulson</u> GOA Dusky rockfish – <u>Pete Hulson</u> for <u>Kari Fenske</u>
	<b>End Day 2</b>			

### Wednesday, June 19<sup>th</sup>, 2019

#### Morning sessions were held at:

Alaska Fishery Science Center  
7600 Sand Point Way N.E., Building 4  
Seattle, WA 98115  
Traynor Room 2079

#### Afternoon sessions were held at:

At-Sea Processors Association  
4039 21st Ave West Suite 400  
Seattle, WA 98199

Time	Topic	MSC Team members	RFM Team members	Interviewees
9-10	Marine Mammal Lab/Seabirds	All	All	Marine Mammals – <u>Brian Fadely</u> and <u>Jeremy Sterling</u>  Seabirds – <u>Shannon Fitzgerald</u> and <u>Ed Melvin</u> <i>teleconference</i>
10-11am	Ecosystems	All	All	Ecosystem status and trend updates – <u>Ebett Siddon</u>  Ecosystem and multispecies modeling – <u>Kirstin Holsman</u> , <u>Kerim Aydin</u>
11-11:15	BREAK			
11:15-12	Fisheries Monitoring and Analysis- Observer program	All	All	Jennifer Ferdinand
12-1:45	Lunch and travel to APA office			
1:45-2:00	Bycatch engineering/reduction including Salmon avoidance	All	All	Austin Estabrooks presenting Noelle Yochum's slides (NMFS Conservation Engineering)
2pm	Habitats/EFH	All	All	John Olson-NMFS habitat division <i>teleconference</i>
TBD	Enforcement			Alaska Wildlife Trooper
3:00-3:30	Pollock closing meeting	EW, JR, WDB, PK (ASP, GS, JB, MC)	N/A	Austin Estabrooks, Ruth Christiansen, Julie Bonney, (Nicole Kimball)
3:30-4:00	Cod closing meeting	EW, JR, WDB, PK (ASP, GS, JB, MC)	N/A	Dave Gaudet, Julie Decker, Chad See
4:00-4:30	Team debrief and planning meeting	All		
	End Day 3			

## 5.6.2 Stakeholder participation

Sixty days prior to the audit site visit, all stakeholders from the full assessment were informed of the visit and the opportunity to provide information to the auditors in advance of, or during, the site visit. We received no requests from outside stakeholders to take part in meetings, nor did we receive any written submissions regarding the BSAI Atka mackerel, POP, northern rockfish and GOA POP, dusky rockfish, and northern rockfish fisheries.

## 5.6.3 Evaluation techniques

MRAG published an announcement of the assessment on our website and sent a direct email to all stakeholders on our stakeholder list. MSC posted the announcement on its BSAI Mackerel, Pacific Ocean perch and northern rockfish and GOA Pacific Ocean perch, northern rockfish and dusky rockfish track-a-fishery page, as well as sent it by email in their Fishery Announcements newsletter to all registered recipients. At this time, MRAG Americas also announced the assessment site visit dates and location, as well as the assessment team. This was done according to the process requirements as laid out in MSC's Fisheries Certification Process v2.1, and in the MSC Fisheries Standard v2.0/2.01. The site visit for this assessment was held at the same time as the site visit for the 4th surveillance audit and reassessment activities of the certified AK BSAI and GOA flatfish, pollock and cod fisheries the announcements for both went to stakeholders together. Together, these media presented the announcement to a wide audience representing industry, agencies, and other stakeholders.

Information supplied by the clients and management agencies was reviewed by the assessment team ahead of the onsite meeting, and discussions with the clients and management agencies centred on the content within the provided documentation. In cases where relevant documentation was not provided in advance of the meeting, it was requested by the assessment team and subsequently supplied during, or shortly after the meeting. The assessment team and the clients set up meetings with BSAI Mackerel, Pacific Ocean perch and northern rockfish and GOA Pacific Ocean perch, northern rockfish and dusky rockfish fisheries' management and science personnel, and industry and harvest-sector representatives relevant to the fishery assessment.

In the FCR v2.0 default assessment tree used for this assessment, the MSC has 28 PIs, six in Principle 1, 15 in Principle 2, and seven in Principle 3. The PIs are grouped in each principle by 'component.' Principle 1 has two components, Principle 2 has five, and Principle 3 has two. Each PI consists of one or more 'scoring issues;' a scoring issue is a specific topic for evaluation. 'Scoring Guideposts' define the requirements for meeting each scoring issue at the 60 (conditional pass), 80 (full pass), and 100 (state of the art) levels.

Note that some scoring issue may not have a scoring guidepost at each of the 60, 80, and 100 levels; in the case of the example above, scoring issue (b) does not have a scoring issue at the SG60 level. The scoring issues and scoring guideposts are cumulative; this means that a PI is scored first at the SG60 levels. If not all of the SG scoring issues meet the 60 requirements, the fishery fails, and no further scoring occurs. If all of the SG60 scoring issues are met, the fishery meets the 60 level, and the scoring moves to SG80 scoring issues. If no scoring issues meet the requirements at the SG80 level, the fishery receives a score of 60. As the fishery meets increasing numbers of SG80 scoring issues, the score increases above 60 in proportion to the number of scoring issues met; PI scoring occurs at 5-point intervals. If the fishery meets half the scoring issues at the 80 level, the PI would score 70; if it meets a quarter, then it would score 65; and it would score 75 by meeting three-quarters of the scoring issues. If the fishery meets all of the SG80 scoring issues, the scoring moves to the SG100 level. Scoring at the SG100 level follows the same pattern as for SG80.

Principle scores result from averaging the scores within each component, and then from averaging the component scores within each Principle. If a Principle averages less than 80, the fishery fails.

Scoring for this fishery followed a consensus process in which the assessment team discussed the information available for evaluating PIs to develop a broad opinion of performance of the fishery against each PI. Review of sections 3.2-3.5 by all team members assured that the assessment team was aware of the issues for each PI. Subsequently, the assessment team member, or members in this case, responsible for each principle filled in the scoring table and provided a provisional score. The assessment team members reviewed the rationales and scores, and recommended modifications as necessary, including possible changes in scores.

PI scores were entered into MSC's Fishery Assessment Scoring Worksheet (Table 5) to arrive at Principle-level scores.

## 5.7 Peer Review reports

To be drafted at Public Comment Draft Report

### Peer Reviewer A: General Comments

Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Yes	Clearly these are a well managed fisheries and the high scoring levels reflect this. The only concerns I have, as noted in the PI comments section, are the stock structure issues flagged by the CAB (PI 1.2.2) and a minor concern about seabird bycatch species groups not identified numerically to the specific species level.	These concerns were addressed in the PI comments.
	Not applicable. There are no conditions raised again attesting to strength of the stock assessments, stock status, full observer coverage, fishery-independent biennial surveys, and habitat and ecosystem considerations; all in support of very well managed fisheries.	No response needed by the team.
	Not applicable. The fishery did not have any conditions.	No response needed by the team.

N/A	<p>Apart from a few minor typos the report is well written. I note there are still some comments to team members for input in some sections. The background information was very useful but note the issues raised on stock structure and seabird bycatch. The latter was also raised by the CAB. I agree with the Recommendation for more clarity on the "parallel" state fishery management processes. I realize that recommendations are non-binding but a recommendation flagging the stock structure issue may be helpful to expedite the research needed to better understand the significance of the concern.</p>	<p>These concerns were addressed in the PI comments, and hopefully all the typos were corrected.</p>

## Peer Reviewer A PI Comments:

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
Performance Indicator (PI)	Has all available relevant information been used to score this PI?	Does the information and/or rationale used to score this PI support the given score?	Will the condition(s) raised improve the fishery's performance to the SG80 level?	<p>PRs should provide support for their answers in the left three columns by referring to specific scoring issues and/or scoring elements, and any relevant documentation as appropriate. Additional rows should be inserted for any PIs where two or more discrete comments are raised e.g. for different scoring issues, allowing CABs to give a different answer in each case. Paragraph breaks may also be made within cells using the Alt-return key combination.</p> <p>Detailed justifications are only required where answers given are one of the 'No' options. In other (Yes) cases, either confirm 'scoring agreed' or identify any places where weak rationales could be strengthened (without any implications for the scores).</p>	<p>CABs should summarise their response to the Peer Reviewer comments in the CAB Response Code column and provide justification for their response in this column.</p> <p>Where multiple comments are raised by Peer Reviewers with more than one row for a single PI, the CAB response should relate to each of the specific issues raised in each row.</p> <p>CAB responses should include details of where different changes have been made in the report (which section #, table etc.).</p>	See codes page for response options
1.1.1	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
1.1.2	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)

1.2.1	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
1.2.2	Yes	Yes	NA	Scoring agreed but the CAB acknowledges that BSAI stocks are potentially caught outside the UoAs by other countries (i.e. Russia). To what extent is this believed to be a small source of uncertainty given the PI 1.2.2b score of SG 80 and implications for scoring 1.2.3a? Is there other information on the potential impact of foreign fisheries to help understand the scope of the issue such as the magnitude of foreign catches outside the US EEZ. The assessment team should consider a recommendation to further support on-going research on this issue given the prevailing uncertainty on the impacts of potential foreign catches on stock status.	The team agreed with the Reviewer and drafted a new recommendation.	Accepted (no score change)
1.2.3	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)

1.2.4	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.1.1	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.1.2	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.1.3	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)



2.2.1	Yes	Yes	NA	Scoring agreed but as reported the identification to the species level (i.e. storm petrels: fork-tailed vs Leach's (ETP)) has not occurred. It would be helpful to know how much this is due to a lack of adequate resourcing or practical concerns affected by low encounters (sampling opportunities/necropsy verification), etc.	The report states "Observers identify each bird in their sample to the most accurate species or species group that they can. Species identification is verified for bird specimens collected through an AFSC-managed necropsy program. This program provides birds collected by observers from bycatch and ship strikes to a vendor to necropsy and verify the species identification." Additional text has been inserted. In short, the necropsy program verification takes some time, and catch numbers are updated once verification is completed.	Accepted (no score change)
2.2.2	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.2.3	Yes	Yes	NA	Scoring agreed. The lack of identification of some seabirds to the species level is concerning (see previous comment) but the low encounter rate and the 100% observer coverage rate in the UoAs alleviates this concern somewhat.	As stated above, additional text has been inserted to note that the necropsy program verification takes some time, and catch numbers are updated once verification is completed.	Accepted (no score change)

2.3.1	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.3.2	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.3.3	Yes	Yes	NA	Scoring agreed. Curiously, how can the reported recent UoA1 increase in Leach's storm petrel bycatch be confirmed if the species grouping includes the non-ETP storm petrel fork-tailed species?	Due to the grouping of bycatch data, it is unknown which storm petrel species were impacted and what the bycatch numbers were for each species. A footnote to Table 18 was inserted for clarification.	Accepted (no score change)
2.4.1	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)

2.4.2	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.4.3	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.5.1	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
2.5.2	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)

2.5.3	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
3.1.1	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
3.1.2	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
3.1.3	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)

3.2.1	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
3.2.2	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
3.2.3	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)
3.2.4	Yes	Yes	NA	Scoring agreed	No response needed by the team.	Accepted (no score change)

**Peer Reviewer B General Comments:**

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	Mostly. There are some minor suggestions to change scoring, but in general yes.	The suggestions have been addressed in the report and in the PI comments.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]		NA	
Is the client action plan clear and sufficient to close the conditions raised? [Reference FCR v2.0, 7.11.2-7.11.3 and sub-clauses]		Note: Include this row for assessments completed against FCR v1.3 and v2.0, but not for FCP v2.1 (in which the client action plan is only prepared at the same time as the peer review). Delete this text from the cell for FCR v1.3/v2.0 reviews or delete the whole row if FCP v2.1.	

Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?		NA	
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	The CAB did a good job organizing the information for a complex document with multiple UoAs.	
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	It might be best if “Draft scoring range” and “Information gap indicator” were removed from the document.	
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	There are a number of spelling mistakes and typos (e.g. Table 2 caption).	We checked for typos and hopefully got them all.

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	Author comments should probably be removed from the document on pages 74, 77, 82, 112, 114, 119 and 122 (though I may have missed some).	The comments have been removed.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	CAB may wish to review and re-think the definition of ETP vs primary species when scoring P2. From MSC “MSC (2014) defines primary species as a species that is caught but is not the target species, that is within scope of the MSC program (i.e., not an amphibian, reptile, bird, or marine mammal), and that has management tools and measures in place.” Some of the stocks/species listed as ETP stocks/species have directed fisheries associated with them, including FMPs (e.g King crabs, Opillio crab, P. halibut and P. herring). Being “prohibited species” in a national FMP does not qualify them as ETP for MSC, and should therefore be scored under primary specie. I understand, however, that this will likely not be a light undertaking.	The CAB agrees that the PSC species are a bit oddly placed in ETP. However, these species are protected from being caught in non-directed fisheries, and many have annual limits, which is in line with the wording of the ETP Pls. Additionally, the precedent has been set (i.e., other fisheries that interact with PSC species have been assessed in this way). Therefore, the CAB believes that the species' designation is appropriate as it stands. No changes have been made.



**Peer Reviewer B PI Comments:**

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
Performance Indicator (PI)	Has all available relevant information been used to score this PI?	Does the information and/or rationale used to score this PI support the given score?	Will the condition(s) raised improve the fishery's performance to the SG80 level?	<p>PRs should provide support for their answers in the left three columns by referring to specific scoring issues and/or scoring elements, and any relevant documentation as appropriate. Additional rows should be inserted for any PIs where two or more discrete comments are raised e.g. for different scoring issues, allowing CABs to give a different answer in each case. Paragraph breaks may also be made within cells using the Alt-return key combination.</p> <p>Detailed justifications are only required where answers given are one of the 'No' options. In other (Yes) cases, either confirm 'scoring agreed' or identify any places where weak rationales could be strengthened (without any implications for the scores).</p>	<p>CABs should summarise their response to the Peer Reviewer comments in the CAB Response Code column and provide justification for their response in this column.</p> <p>Where multiple comments are raised by Peer Reviewers with more than one row for a single PI, the CAB response should relate to each of the specific issues raised in each row.</p> <p>CAB responses should include details of where different changes have been made in the report (which section #, table etc).</p>	See codes page for response options
1.1.1	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)

1.1.2	Yes	Yes	NA	NA	No response needed by the team.	Accepted (no score change)
1.2.1	Yes	Yes	NA	Scoring agreed. Note B40% is only a guideline rather than a rule. Higher or lower values can be more appropriate given the longevity or natural mortality of the stock or species. I will defer to the CAB's judgement as it is a more precautionary approach, but the argument that B35% is an appropriate BMSY proxy can be made.	The team stresses that it would be more precautionary to have a higher level of biomass as reference point. Therefore, the team would not change the rationale.	Accepted (no score change)
1.2.2	Yes	Yes	NA	See 1.2.1 comment above	See response above	Accepted (no score change)
1.2.3	Yes	Yes	NA	Scoring agreed. This in one of the few places in the world that has just a wealth of data outside the normal fishery monitoring for Sl <sub>a</sub> and c. However in the last sentence under Sl <sub>b</sub> it states "the uncertainty in stock configurations of the 6 UoAs is not possible to conclude" do you mean stock structure?	Yes. The word has been changed in the report.	Accepted (no score change)

1.2.4	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
2.1.1	Yes	Yes	NA	Scoring cautiously agreed pending resolution of the general comment. Please see general comments with regards to the definition of Main Primary and ETP species.	As noted in the general comment field, the CAB agrees that the PSC species are a bit oddly placed in ETP. However, these species are protected from being caught in non-directed fisheries, and many have annual limits, which is in line with the wording of the ETP PIs. Additionally, the precedent has been set (i.e., other fisheries that interact with PSC species have been assessed in this way). Therefore, the CAB believes that the species' designation is appropriate as it stands. No changes have been made.	Not accepted (no score change)
2.1.2	Yes	Yes	Yes	Scoring cautiously agreed pending resolution of the general comment. Please see general comments with regards to the definition of Main Primary and ETP species.	As noted in the general comment field, the CAB agrees that the PSC species are a bit oddly placed in ETP. However, these species are protected from being caught in non-directed fisheries, and many have annual limits, which is in line with the wording of the ETP PIs. Additionally, the precedent has been set (i.e., other fisheries that interact with PSC species have been assessed in this way). Therefore, the CAB believes that the species' designation is appropriate as it stands. No changes have been made.	Not accepted (no score change)

2.1.3	Yes	Yes	Yes	Scoring cautiously agreed pending resolution of the general comment. Please see general comments with regards to the definition of Main Primary and ETP species.	As noted in the general comment field, the CAB agrees that the PSC species are a bit oddly placed in ETP. However, these species are protected from being caught in non-directed fisheries, and many have annual limits, which is in line with the wording of the ETP PIs. Additionally, the precedent has been set (i.e., other fisheries that interact with PSC species have been assessed in this way). Therefore, the CAB believes that the species' designation is appropriate as it stands. No changes have been made.	Not accepted (no score change)
2.2.1	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
2.2.1	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)

2.2.2	Yes	No (score increase expected)	NA	Scoring mostly agreed. But for Slc there appears to be clear evidence that a partial strategy has been implemented successfully given the low bycatch. Is not a score of 100 more appropriate? More justification is needed as to why not if that is the case.	The team agrees with the peer reviewer, so the rationale has been adjusted accordingly.	Accepted (score increased)
2.2.2	Yes	No (scoring implications unknown)	NA	For Sle is the review not conducted at least biennially? If so then this should be stated in the justification.	The team recognizes that the Council meets five times per year and reviews alternative measures to minimize unwanted catch and that the SAFE reports that are published annually. However, it is not clear that all secondary species are considered on a biennial basis. The rationale has been edited for clarification sake, but no scoring change has occurred.	Not accepted (no score change)
2.2.3	Yes	Yes	NA	Scoring agreed. But under the rationale would suggest a wording change under Slb to “there is not adequate information to know the UoAs’ impact on the status of all secondary species as the status of some of these are unknown”. For clarity.	Change made as suggested.	Accepted (no score change)
2.3.1	Yes	Yes	NA	Scoring cautiously agreed pending resolution of the general comment. Please see general comments with regards to the definition of Main Primary and ETP species.	As noted in the general comment field, the CAB agrees that the PSC species are a bit oddly placed in ETP. However, these species are protected from being caught in non-directed fisheries, and many have annual limits, which is in line with the wording of the ETP Pls. Additionally, the precedent has been set (i.e., other fisheries that interact with PSC species have been assessed in this way). Therefore, the CAB believes that the	Not accepted (no score change)

					species' designation is appropriate as it stands. No changes have been made.	
2.3.1	Yes	Yes	NA	Scoring cautiously agreed pending resolution of the general comment. Please see general comments with regards to the definition of Main Primary and ETP species.	As noted in the general comment field, the CAB agrees that the PSC species are a bit oddly placed in ETP. However, these species are protected from being caught in non-directed fisheries, and many have annual limits, which is in line with the wording of the ETP Pls. Additionally, the precedent has been set (i.e., other fisheries that interact with PSC species have been assessed in this way). Therefore, the CAB believes that the species' designation is appropriate as it stands. No changes have been made.	Not accepted (no score change)
2.3.2	Yes	Yes	NA	Scoring cautiously agreed pending resolution of the general comment. Please see general comments with regards to the definition of Main Primary and ETP species. For Sle "SG100 is not met since the regularity of the meetings and the review process cannot be confirmed." These are public record and should be easily confirmed. If not, then rewording of the rationale is appropriate to indicate that it is not biennial.	As noted in the general comment field, the CAB agrees that the PSC species are a bit oddly placed in ETP. However, these species are protected from being caught in non-directed fisheries, and many have annual limits, which is in line with the wording of the ETP Pls. Additionally, the precedent has been set (i.e., other fisheries that interact with PSC species have been assessed in this way). Therefore, the CAB believes that the species' designation is appropriate as it stands. As for Sle, see the CAB response in the line below.	Not accepted (no score change)

2.3.2	Yes	Yes	NA	Scoring cautiously agreed pending resolution of the general comment. Please see general comments with regards to the definition of Main Primary and ETP species. For Sle "SG100 is not met since the regularity of the meetings and the review process cannot be confirmed." These are public record and should be easily confirmed. If not, then rewording of the rationale is appropriate to indicate that it is not biennial.	For the first part of this comment, see the CAB response in the line above. As for Sle, the rationale has been changed following additional information from the client.	Accepted (no score change)
2.3.3	Yes	Yes	NA	Scoring cautiously agreed pending resolution of the general comment. Please see general comments with regards to the definition of Main Primary and ETP species.	As noted in the general comment field, the CAB agrees that the PSC species are a bit oddly placed in ETP. However, these species are protected from being caught in non-directed fisheries, and many have annual limits, which is in line with the wording of the ETP PIs. Additionally, the precedent has been set (i.e., other fisheries that interact with PSC species have been assessed in this way). Therefore, the CAB believes that the species' designation is appropriate as it stands. No changes have been made.	Not accepted (no score change)
2.4.1	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)

2.4.2	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
2.4.3	Yes	No (non-material score reduction expected)	NA	Observer logs of bycatch may not be enough to document changes in overall habitat distribution changes. Observer documentation will only be able to examine where fishing is in any given year, not in areas outside that yearly fishing footprint. Fishery independent surveys in the area could however be used to justify a score of 100, but that needs to be added to the justification if true.	The team agrees with the peer reviewer, so the rationale has been adjusted, and the score has been lowered accordingly.	Accepted (non-material score reduction)
2.5.1	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
2.5.2	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)



2.5.3	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
3.1.1	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
3.1.2	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
3.1.3	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)

3.2.1	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
3.2.2	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
3.2.3	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)
3.2.4	Yes	Yes	NA	Scoring agreed.	No response needed by the team.	Accepted (no score change)

## **5.8 Stakeholder input**

To be drafted at Client and Peer Review Draft Report

To be completed at Public Certification Report

Not applicable. No stakeholders' comments have been received during the course of the audit.

## **5.9 Conditions**

To be drafted from Client and Peer Review Draft Report

Not applicable. The fishery did not have any conditions.

## **5.10 Client Action Plan**

To be added from Public Comment Draft Report

Not applicable. The fishery did not have any conditions.

## 5.11 Surveillance

To be drafted from Client and Peer Review Draft Report

**Table 23. Fishery surveillance program.**

Surveillance level	Year 1	Year 2	Year 3	Year 4
<b>Level 1</b>	<b>Review of Information audit</b>	<b>Off-site surveillance audit</b>	<b>Review of Information audit</b>	<b>On-site surveillance audit &amp; re-certification site visit</b>

**Table 24. Timing of surveillance audit.**

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
Year 1	TBD	Within 6 months of anniversary date of certificate	This surveillance will be coordinated with the certified BSAI and GOA cod, pollock and flatfish fisheries

**Table 25. Surveillance level rationale.**

Year	Surveillance activity	Number of auditors	Rationale
e.g.3	e.g. On-site audit	e.g. 1 auditor on-site with remote support from 1 auditor	e.g. From client action plan it can be deduced that information needed to verify progress towards conditions 1.2.1, 2.2.3 and 3.2.3 can be provided remotely in year 3. Considering that milestones indicate that most conditions will be closed out in year 3, the CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely.
Year 2	<b>Off-site surveillance audit</b>		
Year 3	<b>Review of Information audit</b>		
Year 4	<b>On-site surveillance audit &amp; re-certification site visit</b>		

## **5.12 Risk-Based Framework outputs**

Not applicable. RBF was not used in this assessment.

### 5.13 Harmonised fishery assessments –

To be drafted at Announcement Comment Draft Report stage

To be completed at Public Certification Report stage

**Table 26. Overlapping fisheries.**

Fishery name	Certification status and date	Performance Indicators to harmonise
BSAI Pollock	Certified, January 12, 2016	PI 2.1x, 2.2x, 2.3x, 2.4x, 2.5x, 3.1x, 3.2x,
BSAI Cod	Certified, June 18, 2015	PI 2.1x, 2.2x, 2.3x, 2.4x, 2.5x, 3.1x, 3.2x,
BSAI Flatfish	Certified, October 29, 2015	PI 2.1x, 2.2x, 2.3x, 2.4x, 2.5x, 3.1x, 3.2x,
GOA Pollock	Certified, January 12, 2016	PI 2.1x, 2.2x, 2.3x, 2.4x, 2.5x, 3.1x, 3.2x,
GOA Cod	Certified, June 18, 2015	PI 2.1x, 2.2x, 2.3x, 2.4x, 2.5x, 3.1x, 3.2x,
GOA Flatfish	Certified, October 29, 2015	PI 2.1x, 2.2x, 2.3x, 2.4x, 2.5x, 3.1x, 3.2x,

**Table 27. Scoring differences.**

Performance Indicators (PIs)	Fishery name	Fishery name	Fishery name	Fishery name
<b>PI</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>PI</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>PI</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

**Table 28. Rationale for scoring differences.**

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.1 Annex PB1.3.6)

There is a Memorandum of Agreement between the clients for all of the Alaska groundfish fisheries, allowing certified species under each certificate to be landed and sold as certified by the other clients. Principle 3 management is very similar for all Council-managed groundfish fisheries in the BSAI and scores are consequently aligned. All clients participate in joint assessment and audit visits and have more or less the same assessment teams. There is no need for any more formal harmonization process as a result.

If exceptional circumstances apply, outline the situation and whether there is agreement between or among teams on this determination

## 5.14 Objection Procedure – delete if not applicable

To be added at Public Certification Report stage

The report shall include all written decisions arising from a 'Notice of Objection', if received and accepted by the Independent Adjudicator.

Reference(s): FCP v2.1 Annex PD