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Responsible Fishery Management (RFM)

Alaska Flatfish Complex

Final Assessment Report

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Fishery client	Alaska Seafood Cooperative		
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2 List of Abbreviations (some of which may also be acronyms)

ABC	Acceptable Biological Catch
ABM	Abundance Based Management
ACAP	Agreement on the Conservation of Albatrosses and Petrels
ADFG	Alaska Department of Fish and Game
AFDF	Alaska Fisheries Development Foundation
AFSC	Alaska Fishery Science Center
AI	Aleutian Islands
AKSC	Alaska Seafood Cooperative (client group)
AWT	Alaska Wildlife Troopers
BASIS	Bering-Aleutian Salmon International Survey
BMSY	Biomass that would provide maximum sustainable yield
BOF	Board of Fisheries
BS	Bering Sea
BSAI	Bering Sea and Aleutian Islands
CAAL	Condition-Age-At-Length
CDQ	Community Development Quota
CEA	Cumulative Effects Assessment
CH	Critical Habitat
CPUE	Catch per unit effort
CFSR	Climate Forecast System Reanalysis
CP	Catcher Processor
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
DMR	Discard Mortality Rates
EBFM	Ecosystem-based fisheries management
EBS	Eastern Bering Sea
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FEP	Fisheries Ecosystem Plan
FMP	Fishery Management Plan
FOFL	Maximum Allowable Fishing Mortality Rate
GHL	Guideline Harvest Levels
GOA	Gulf of Alaska
HAPC	Habitat Areas of Particular Concern
HCR	Harvest Control Rules
IPCC	Intergovernmental Panel on Climate Change
ISC	Ice Seal Committee
JEA	Joint Enforcement Agreement
MBTA	Migratory Bird Treaty Act
MCS	Monitoring, Control and Surveillance
MMPA	Marine Mammal Protection Act
MRA	Marine Reserve Area
MSA	Magnuson-Stevens Act
MSY	Maximum Sustainable Yield
MSST	Minimum Stock Size Threshold
NBS	Northern Bering Sea
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NMIN	Minimum Population Estimate
NOVA	Notice of Violation and Assessment
NPFMC	North Pacific Fishery Management Council
NPRB	North Pacific Research Board
OFL	Overfishing Limits
OLE	Office of Law Enforcement (NOAA)
PBR	Point of Biological Recruitment
PRI	Point of Recruitment Impairment
PSC	Prohibited species catch
RFM	Responsible Fisheries Management
RPA	Reasonable and Prudent Alternatives
SAFE	Stock Assessment and Fishery Evaluation

SC	Supporting Clause
SSB	Spawning stock biomass
SSC	Scientific and Statistical Committee
SSL RPAs	Steller Sea Lion Reasonable and Prudent Alternatives
SSOP	Statement of Organization, Practices and Procedures (NPFMC)
TAC	Total Allowable Catch
TK	Traditional Knowledge
TRP	Target Reference Point
UoC	Unit of Certification
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service

3 Executive Summary

MRAG Americas was contracted by Alaska Seafood Cooperative (AKSC) to assess the Alaska (AK) flatfish fishery under the Responsible Fishery Management (RFM) certification program. An onsite site visit was held at the offices of the Alaska Seafood Cooperative on March 14th, 2024 in conjunction with the Marine Stewardship Council (MSC) 4th surveillance audit of Bering Sea and Aleutian Island (BSAI) & Gulf of Alaska (GOA) Atka mackerel, Pacific Ocean Perch (POP), and rockfish, the MSC 3rd surveillance audit for BSAI & GOA flatfish, and the Responsible Fisheries Management (RFM) reassessments for Alaska Atka mackerel and rockfish.

At least 30 days prior to the site visit, all identified stakeholders were informed of the visit and the opportunity to provide information to the assessment team in advance of, or during, the site visit. Managers, stock assessment authors and various stakeholders provided information by email, joined remotely or participated in person during the site visit.

The team considered all the above information to assess conformance of the fishery with the RFM Standard. No issues were identified, and no changes in the fishery occurred that would result in a change in certification from the last surveillance. The fisheries had no non-conformances or recommendations. No clauses were rescored. Findings of the assessment team regarding conformance are summarized below at the level of the four Components:

Component	Non-Conformances			Summary of conformance
	Minor	Major	Critical	
A. The Fisheries Management System	None	None	None	Full conformance
B. Science and Stock Assessment Activities and the Precautionary Approach	None	None	None	Full conformance
C. Management Measures, Implementation, Monitoring, and Control	None	None	None	Full conformance
D. Serious Impacts of the Fishery on the Ecosystem	None	None	None	Full conformance
<i>Total</i>	<i>0</i>	<i>0</i>	<i>0</i>	Full conformance

Main Strengths and Weaknesses of the fishery

Strengths	Weaknesses
<ul style="list-style-type: none"> All stocks are above a level consistent with maximum sustainable yield (MSY). Effective harvest strategies and harvest control rules (HCRs) are in place and effective. Excellent data on removals of all non-target and Endangered, Threatened and Protected (ETP) species; 100% observer coverage. This is a very well managed fishery, with clear objectives, roles and responsibilities, a fishery management plan that is reviewed and regularly updated and effective decision-making in terms of the overall sustainability of the fishery. 	<ul style="list-style-type: none"> The use of a proxy for BMSY and the uncertainties in stock structure. Data is not updated on habitats management or ETP species status—but this is not a weakness of the fishery, simply a function of the current assessment stage. The assessment team only had access to North Pacific Fishery Management Council (NPFMC) reports to determine if sanctions in place deter non-compliance as there were some notable infractions listed in recent enforcement reports. The enforcement contacts provided did not respond to meeting requests or provide further information that supports that the management system and penalties in place provide effective deterrence.

Recommendation of the Team with respect to Certification

In accordance with the RFM Guidance and the RFM Standard v2.1, the assessment team recommends that this fishery be recertified.

3.1 Assessment Team Details

Ms. Erin Wilson (team leader) joined MRAG Americas, Inc. in February 2015, where she currently works as a Senior Manager in the Fisheries Certification Division. She serves as the team leader on several MSC assessments, including North and South Pacific albacore tuna fishery, US West Coast Groundfish fishery, and all the Alaska Groundfish fisheries, and has served as a team member for several other fishery assessments, including both MSC and Responsible Fisheries Management (RFM). Prior to joining MRAG Americas, she worked 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 has completed ISO 19011 Lead Auditor for Management Systems, SA8000, the SRA training for Fishery Progress, and all the MSC and RFM required trainings for team leader and assessment team member. She received a M.Sc. in Marine Resource Management from Oregon State University and a B.S. in Zoology from Colorado State University, along with a Spanish minor.

Ms. Amanda Stern-Pirlot is an M.Sc graduate of the University of Bremen, Center for Marine Tropical Ecology (ZMT) in marine ecology and fisheries biology. Ms. Stern-Pirlot joined MRAG Americas in mid-June 2014 as MSC Certification Manager (now Director of the Fishery Certification Division) and is currently serving on several different assessment teams as team leader and team member. She has worked together with other scientists, conservationists, fisheries managers and producer groups on international fisheries sustainability issues for over 15 years. With the Institute for Marine Research (IFM-GEOMAR) in Kiel, Germany, she led a work package on simple indicators for sustainable within the EU-funded international cooperation project INCOFISH, followed by five years within the Standards Department at the Marine Stewardship Council (MSC) in London, developing standards, policies and assessment methods informed by best practices in fisheries management around the globe. Most recently she has worked with the Alaska pollock industry as a resources analyst, within the North Pacific Fisheries Management Council process, focusing on bycatch and ecosystem-based management issues, and managing the day-to-day operations of the offshore pollock cooperative. She has co-authored a dozen publications on fisheries sustainability in the developing world and the functioning of the MSC as an instrument for transforming fisheries to a sustainable basis.

Dr. 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 Marine Stewardship Council 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).

3.2 RFM program and documents

The RFM program is a voluntary certification program developed by the Alaska Seafood Marketing Institute (ASMI). The program was created to provide an independent, third-party verification that certified fisheries are responsibly managed. The documents detailed in the table below together form the basis for the RFM assessment and certification process described in the following section.

RFM document name	Full title	Version	Issued
Standard	Responsible Fisheries Management Certification Program Fisheries Standard	2.1	Sep 2020

RFM document name	Full title	Version	Issued
Guidance	Alaska Responsible Fisheries Management Certification Program Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in Alaska	2.0*	May 2018
Procedure	RFM Procedure 2: Application to Certification Procedures for the RFM Fishery Standard Version 2.1	6	Sep 2020

*The RFM website reads “This guidance is currently being revised for V2.1, for now please use V2.0”.

3.3 Unit of Certification

The Unit of Certification (UoC) is defined by the Standard to specify “the fishery under assessment, the geographical area where the fishery is prosecuted, the gear type(s) employed, and the key management organization(s)”. The UoC considered by this assessment is specified in the table below. Under the RFM certification, there are 12 species, seven species in the Bering Sea and Aleutian Islands (BSAI) and five species in the Gulf of Alaska (GOA).

Seven species in the BSAI area

- Kamchatka flounder (*Atheresthes evermanni*), arrowtooth flounder (*Atheresthes stomias*), flathead sole (*Hippoglossoides elassodon*), Northern rock sole (*Lepidopsetta polyxstra*), yellowfin sole (*Pleuronectes asper*, *Limanda aspera*) and Alaska plaice (*Pleuronectes quadrituberculatus*), Greenland turbot (*Reinhardtius hippoglossoides*)

Five species in the GOA

- Arrowtooth flounder (*Atheresthes stomias*), flathead sole (*Hippoglossoides elassodon*), Northern rock sole (*Lepidopsetta polyxstra*), Rex sole (*Glyptocephalus zachirus*), Southern Rock sole (*Lepidopsetta bilineata*)

Species	Alaska plaice (<i>Pleuronectes quadrituberculatus</i>), BSAI Arrowtooth flounder (<i>Atheresthes stomias</i>), BSAI & GOA Flathead sole (<i>Hippoglossoides elassodon</i>), BSAI & GOA Greenland turbot (<i>Reinhardtius hippoglossoides</i>), BSAI Kamchatka flounder (<i>Atheresthes evermanni</i>), BSAI Northern rock sole (<i>Lepidopsetta polyxstra</i>), BSAI & GOA Yellowfin sole (<i>Limanda aspera</i>), BSAI Southern rock sole (<i>Lepidopsetta bilineatus</i>), GOA Rex sole (<i>Glyptocephalus zachirus</i>), GOA
Geographical areas	Northeast Pacific, FAO 67
Gears/ methods	Bottom trawl
Client Group	Alaska Seafood Cooperative

4 Fishery Background, History, and Status

4.1 Species biology and stock structure

The BSAI and GOA flatfish complex subject to certification comprises a suite of 12 species/stocks: BSAI & GOA Arrowtooth flounder (*Atheresthes stomias*), BSAI Kamchatka flounder (*Atheresthes evermanni*), BSAI Alaska plaice (*Pleuronectes quadrituberculatus*), BSAI & GOA Flathead sole (*Hippoglossoides elassodon*), BSAI & GOA Northern rock sole (*Lepidopsetta polyxstra*), BSAI Yellowfin sole (*Limanda aspera*), GOA Southern rock sole (*Lepidopsetta bilineatus*), GOA Rex sole (*Glyptocephalus zachirus*) and BSAI Greenland turbot (*Reinhardtius hippoglossoides*). Studies of the life histories, influence of environmental and trophodynamic conditions on the various aspects of stock productivity and distribution, and impacts of fisheries on distribution and biology have been conducted for decades and continue to accumulate for all the flatfish species. The NOAA Stock Assessment and Fishery Evaluation (SAFE) reports were used as main sources of background information on the species' biology and fisheries, augmented by past MSC Certification assessment reports and new literature accumulated since the last MSC certification assessment. Also the Bering Sea and Aleutian (hereafter BSAI) Islands Gulf of Alaska (hereafter GOA) Fishery Management Plans (hereafter FMPs) were used for source of information in the present report.

It is important to stress that some flatfish may experience range extension or stock level increases due to climate drivers. Commercially valuable flatfish stocks are under-going changes in distribution, abundance, and behaviors. Any projections for stock abundances in the future are very tentative, and observed trends may be specific to regions or locations. Major abundance shifts, if they do occur, will develop over a period of decades (see: https://alaskaseagrant.org/wp-content/uploads/2018/02/Climate-Change-and-Fisheries_Johnson_WEB.pdf).

Arrowtooth Flounder (*Atheresthes stomias*). Large flatfish widespread in the eastern and northern Pacific, with a range from central California to Bering Sea. They are the most abundant flatfish in much of the Eastern Bering Sea (hereafter EBS) and GOA, but abundance declines along the Aleutian Islands, and at depths deeper than 200 m down to approximately 500 m. Habitat preference is for soft bottoms, but is widespread among gravel, sand and mud bottom types. Stock structure has not been studied in detail, but no distributional discontinuities have been found in either the EBS or between the EBS and other parts of its range. Moreover, studies of the pattern of changing abundance in space and time have shown the changes are the result of complex interacting processes of at least density dependence (expansion into less preferred substrate types at high densities) and water temperatures, but do not support the hypothesis that there are isolated subpopulations within the management unit.

Although in the 1980's a complex of related flatfish species was managed as a unit, in 1986 Greenland turbot were split off as a separate species for monitoring, assessment, and management. In 1992 Kamchatka flounder (*A. evermanni*) were also identified separately in the research surveys and separated for separate catch monitoring in 2007 and management in 2011. Since 2011 in the BSAI, arrowtooth flounder and Kamchatka flounder have been managed separately. Juvenile arrowtooth flounder are predominantly found in shelf waters until age 4, but begin to move over the slope at around age 4. Older ages occupy both shelf and slope waters, with some annual change in preferred depths (deeper in winter). Moreover, survey catches suggest that the proportion of the stock over the slope or on the shelf may vary greatly among years. This could either suggest there are oceanographic drivers to some of the distribution information we have or that age/size changes in population structure over time can interfere with the ability to detect seasonal depth migrations. Beyond age 9 there are no further systematic changes in proportion of the population in the shelf and slope. However, on average approximately 50% of the population of mature, older individuals is still found on the shelf, with no population substructure clearly visible. Based on data from the 1980s, recruitment to the adult population extends over several years.

The age of 50% maturity has been estimated at approximately 7 years of age, and is length dependent. Early studies found the size of 50% maturity was 46.9 and 42.2 cm (males and females respectively), and recent data on only females suggested the size at 50% maturity may have increased by 10-15%. Maximum age is estimated to be around 15 years, somewhat younger than several of the other BSAI flatfish. Analyses have found a correspondingly higher natural mortality of around 0.2 for females and males 35% higher. Neither maximum age nor natural mortality has been thoroughly validated by tagging and other directed studies, but the set of life history parameters appear coherent in assessments.

Spawning occurs from December through February but may extend longer into the spring than for other BSAI flatfish, and tends to be in more offshore or deeper portions of their range. A strong density dependence of recruitment has been documented. However this is combined with a strong effect of interannual differences in lower trophic level productivity and wind-borne advection of larvae and young of the year to shallower nursery areas, with higher productivity and more on-shore advection favoring stronger recruitment. As abundance of arrowtooth flounder has increased over the two recent decades, a reduction in annual recruitment consistent with a density dependent has continued to be seen, and documentation of a contribution of the Arctic Oscillation to bottom-up productivity has strengthened.

Because of their abundance and increasingly piscivorous diet with size, arrowtooth flounder are an important predator in the BSAI. They prey heavily on juvenile pollock, but take a wide range of other fish and macroinvertebrates. Their high abundance can make them a major source of predation mortality on their more common prey, but they have not been shown to have a sufficiently high dependence on any single prey that variation in the abundance of any one prey will directly affect the feeding or growth of arrowtooth flounder. Studies in the GOA have found them at least locally important as a prey of stellar Sea lions. There are two stocks of arrowtooth flounder in the west coast of US: BSAI and GOA arrowtooth flounder, which are assessed and managed separately.

Kamchatka Flounder (*Atheresthes evermanni*). This flounder is a relatively large flatfish found primarily in the northwest Pacific Ocean. Distribution records are available from Northern Japan through the Sea of Okhotsk to the Western Bering Sea. Range continues particularly along the Aleutian Island chain, to the eastern Bering Sea shelf and south of the Alaska Peninsula at probably a decreasing abundance eastward. The northern limit of records is Anadyr Gulf. In the EBS and GOA, the range of Kamchatka flounder overlaps with arrowtooth flounder (*Atheresthes stomias*). The two species are morphologically very similar and were not routinely distinguished in survey catches before 1992 and in the commercial catches until. The two species were managed as a complex until 2010. However, at that time a directed fishery for Kamchatka flounder developed in the BSAI management area. This posed a challenge for managing the two species together, because the ABC was comprised 93% of arrowtooth flounder. In fact, the combined ABC actually exceeded the survey-based estimates of Kamchatka flounder biomass, so the high combined TAC presented a large opportunity for overharvesting the targeted Kamchatka flounder. Thus, since the 2011 fishing season, arrowtooth

flounder and Kamchatka flounder have been assessed and managed separately. Although the arrowtooth and Kamchatka flounder differ greatly in abundance in BSAI, many life history parameters are similar between the species, and typical of the genus *Atheresthes*. Size at age is similar, at least until the two species reach sexual maturity. Thereafter age at length calculations from a small sample collected in 1991 indicate that males and females exhibit divergent growth with females growing larger than males.

Maximum document age of Kamchatka flounder is 33 years, similar to the life expectancy of most other Bering Sea flatfish. Natural mortality is estimated to be between 0.10 and 0.15, depending on the method used.

Spawning and recruitment has not been well studied for Kamchatka flounder in BSAI. Sampling of commercial catches has documented that spawning occurs in deeper slope waters along the Aleutian Islands and deeper shelf and slope waters of the outer Bering Sea. Spawning is primarily in winter, when fisheries are not targeting either species of *Atheresthes* due to challenging fishing conditions and poor market quality of the flesh. Less is known of the location of nursery grounds, but they are thought to be also in deeper waters along the Aleutian Islands and outer edge of the Bering Sea. Recruitment variation has been inferred from assessment results, and neither dominance in the stock of occasional very strong cohorts nor highly different productivity regimes have been documented. The high relative biomass levels estimated in the assessment are consistent with a relatively large stock receiving regular but modest recruitment.

There is no evidence of large scale seasonal migrations, although there may be a movement to greater depths for spawning. However, the surveys are standardized in time, so they would be a weak source of information on movements, and the fishery is affected by seasonal weather conditions, so the modest differences in catch locations at different seasons cannot be taken as evidence that the stock has moved significantly. Few predators have been documented for Kamchatka flounder although individuals have been found in the stomachs of Pacific cod, pollock, Pacific halibut, arrowtooth flounder, and two sculpin species. The challenges of differentiating small individuals from the more common arrowtooth flounder means the predation estimates have high uncertainty, but by the time individuals reach 3 years, the species complex is rare in predator stomachs. The primary diet data come from older studies, and generally opportunistic sampling. Younger ages of walleye pollock comprise from half to over 80% of stock contents with macro-invertebrates such as shrimp (most Crangonidae) and euphausiids also sometimes common. The diet overlap with arrowtooth flounder indicated that these two congeneric species basically consume the same resources.

Alaska Plaice (*Pleuronectes quadrituberculatus*). Alaska plaice is widespread on the continental shelf of the BSAI, preferring depths under 200 m but occasionally taken up to 600 m deep. Juvenile Alaska plaice are found predominately in waters less than 50 m, with depth range increasing with size and age.

The eastern boundary of their range is from the GOA to the Sea of Japan in the west. Their range extends further to the north than many of the other BSAI flatfish, with an opportunistic survey finding nearly 40% of the estimated biomass north of St. Lawrence Island, and the species recorded regularly in the Chukchi Sea. On the other hand Alaska plaice are uncommon along the Aleutian Islands, near the southern limit of their range. Higher abundances are found in the EBS than in other parts of their range, but absolute abundance may be increasing in at least all US waters. There is no evidence of range discontinuities that would suggest the presence of multiple stocks, but a thorough analysis of detailed stock structure as not been undertaken.

Prior to 2002, Alaska plaice were managed as part of the “other flatfish” complex, and some portion of the apparent increase in abundance may result from more careful identification of the species in research surveys. In addition Alaska plaice are grouped with the rock sole, flathead sole, and other flatfish fisheries under a common prohibited species catch (PSC) limit, with seasonal and total annual allowances of prohibited species bycatch by these flatfish fisheries applied to the fisheries within the group. Changes in how bycatches have been managed in 2007 and changes being implemented in observer programs in 2014 and 2015 may affect the information from the commercial fisheries regarding Alaska plaice.

Alaska plaice are found predominantly on mixed sand and mud bottoms, and can tolerate below zero water temperatures because of the presence of an antifreeze protein in their blood. Density dependence and water temperature both have some influence on the local distribution of Alaska plaice, but the relationships have very wide confidence intervals. Fisheries rarely direct for Alaska plaice and retention rate may be low because of weak market conditions, so distributional information comes mostly from research vessel surveys, which rarely sample the northern part of their range, or beyond the US EEZ to the west.

Consistent with being a “cold water” flatfish, growth rates are relatively slow, but life expectancies long. Asymptotic length of around 400 mm for males and 500 mm for females are reached after around 20 years, but individuals ages to 40 years are frequently encountered in the surveys. Age of 50% maturity is reached at approximately 6-7 years and 310 mm for females. Environmental conditions have been found to affect growth rate, with colder temperatures associated with slower growth. Consistent with the relatively long lifespan of Alaska plaice, the annual natural mortality rate was estimated at 0.13 for both sexes, a lower value than was assumed in earlier decades.

Alaska plaice produce pelagic eggs and larvae that are dependent upon oceanic currents for transport to suitable nursery habitat areas which are essential for recruitment success. In the EBS, spawning occurs during the months of April through June over a wide area of the middle continental shelf. From examining the age composition of survey

catches recruitment has been inferred to show regimes and relative lower and higher productivities. Estimated recruitment was declining from 1981-1997, but improving since 1997 with above average strength recruitment in 1998 and exceptionally strong recruitment in 2001 and 2002. With low fishing and natural mortality these regimes are inferred to reflect more favorable and unfavorable environmental conditions, consistent with the documented influence of transport processes on eggs and larvae. Alaska plaice feed mostly on polychaetes, but also eat amphipods, echinurans and many other macro-invertebrates. Most feeding is on benthic infauna and epifauna, with little pelagic feeding. A wide variety of predators have been found to have Alaska plaice in their stomachs, but none have been found to have a strong dependence on the species as a major forage species.

Flathead Sole (*Hippoglossoides elassodon*). "Flathead sole" are managed as a two-species complex consisting of true flathead sole (*Hippoglossoides elassodon*) and its morphologically-similar congener Bering flounder (*H. robustus*). More than 90% of the combined biomass is true flathead sole. There is no evidence that the fishery intentionally targets either species in the complex, although because true flathead sole are so dominant by biomass and numbers in the complex, the tendency for commercial fisheries to seek higher catch rates may make the true flathead sole somewhat over-represented in the catches. "Flathead sole" was included in the "other flatfish" until 1994, when changes in the management of BSAI flatfish fisheries that were intended to increase retention led to a request for a separate ABC and OFL for the "flathead sole" complex. The implementation of Amendment 80 in 2008 further constrained the operation of flatfish fisheries, particularly with regard to bycatch and mixed-species practices. Until that amendment to the BSAI Groundfish FMP, the flathead sole directed fishery was often constrained by the halibut bycatch caps, and consequently suspended or closed prior to attainment of the TAC. Since the implementation of Amendment 80, the fishery has never reached its in-season halibut bycatch limits. In addition, whereas before the Amendment 30% or more of flathead sole were discarded in various EBS fisheries, recent discard rates have been 15% or less.

Northern Rock Sole (*Lepidopsetta polyxystra*). Northern rock sole is part of a two-species rock sole complex, along with southern rock sole (*L. bilineata*). Although the two species can be separated morphologically, care in species identification is needed and historical records often do not differentiate them at all, or are of questionable reliability. Prior to 1987, both species of rock sole were managed in a larger species complex with several other flatfish species, and commercial records prior to that date are even less reliable than more recent ones. The total range for the two species are the North Pacific, from Baja California around to Japan, with centers of abundance off the Kamchatka Peninsula, British Columbia, the central GOA, and in the south-eastern Bering Sea. The northern rock sole overwhelmingly predominates over southern rock sole in the EBS continental shelf and is present in much lesser amounts in the Aleutian Islands region.

Adults exhibit a benthic lifestyle and seem to occupy separate winter (spawning) and summertime feeding distributions on the south-eastern Bering Sea continental shelf. They have been taken at depths down to over 500 m, but they are predominately found at depth of 0-200 m. Finer scale distribution reflects influences of both density, with wider distribution at higher abundances, and environmental conditions. Adults are closely associated with the seabed, preferring softer substrates consisting of sand, gravel, and cobble. Larvae and early juveniles are found in the pelagic water column, but generally in waters of 200 m or shallower.

Male and female rock sole grow similarly until about age 6 after which females grow faster and larger than males. Asymptotic weight is not reached until the mid to late teens in both sexes, at around 400 gm for males and 800 gm for females. Length-at-age over time shows periods of slow and fast growth since the early 1980s. Length at age declined during the 1980s, during a period of increasing abundance and density of rock sole in EBS. Length at age of younger ages increased slightly in the 1990s and 2000s, but has either declined or remained stable for ages past maturity. Both environmental conditions and density dependence have been shown to have influenced these trends, with years of particularly cold bottom temperatures associated with slower growth rates for both sexes.

Maturity is at least partially size dependent, with age of 50% maturity for both females and males at 8-12 years, and males possibly maturing slightly earlier than females. Spawning takes place from December through March, and the main targeted fishery for northern rock sole occurs during this period, to harvest the roe. After spawning the eggs are pelagic, and advection processes transport them to more inshore areas. Prior to regulatory changes in 2000, rock sole were largely discarded outside the spawning season, but since 2000 retention has been at least 90%.

Recruitment has varied over the past 30 years, with periods of higher and lower productivity. There was a period characterized by sustained above-average year-classes from 1980 to 1988, which recruited to the fishable and spawning biomasses in the second half of the 1980s and first half of the 1990s. Both a lesser density dependence and favourable advection and water temperatures for young rock sole may have contributed to the period of higher productivity. The years after 1995 were a period of below average recruitment to the adult portion of the population followed by increased recruitment in 2001-2005. Several year classes in the 2000s appear average to above average. Although the weaker year classes in the later 1990s may reflect effects of increasing density dependence on recruitment. Large recruitments of northern rock sole that occurred at a low spawning stock size in the 1980s suggest that under proper environmental conditions the stock can be highly productive at a smaller stock size. These observations are influential on estimation of reference points ($BMSY = 260,000$ t), with the result that $FMSY$ is highest when fitting the full data set. Year classes and particularly the more recent average to good year classes are also likely to reflect a generally favourable climatic regime, as spawning biomass has been average to above average, with research results documenting effects of

transport processes and temperature on year-class strength. The maximum age for EBS northern rock sole has been in the mid-twenties, consistent with a natural mortality rate slightly less than 0.2, which is typical of flatfish with similar growth rates and maximum ages.

Rock sole diet by life stage varies as follows: Larvae consume plankton and algae, early juveniles consume zooplankton, late juvenile stage and adults prey includes bivalves, polychaetes, amphipods, mollusks and miscellaneous crustaceans. Major fisheries do not target any of these prey. A number of predatory fish consume juvenile and smaller adult adults, including pollock, Pacific cod, halibut, yellowfin sole, and skates, but rock sole are not considered a major prey of any of those predators.

Yellowfin Sole (*Pleuronectes asper*, also known as *Limanda aspera*). The yellowfin sole is one of the most abundant flatfish species in the EBS and is the target of the largest flatfish fishery in the world. They inhabit the EBS shelf and are considered one stock. Abundance in the Aleutian Islands region is negligible. Yellowfin sole are distributed in North American waters from off British Columbia, Canada, (approx. lat. 49° N) to the Chukchi Sea (about lat. 70° N) and south along the Asian coast to about lat. 35° N off the South Korean coast in the Sea of Japan. Densities in preferred habitats of the EBS are as high as or higher than densities in other parts of their range. Adults exhibit a benthic lifestyle and occupy separate winter, spawning and summertime feeding distributions on the EBS shelf.

From over-winter grounds near the shelf margins, adults begin a migration onto the inner shelf in April or early May each year for spawning and feeding. In recent years, the directed fishery has typically occurred from late winter through autumn, once spawning has been completed. Yellowfin sole are managed as a single stock in the BSAI management area as there is presently no evidence of stock structure. Yellowfin sole Essential Fish Habitat (EFH; waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity) have been described for the late juvenile and adult stage of its life cycle: EFH for late juvenile and adult yellowfin sole is the general distribution, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand. The association of yellowfin sole with soft substrates has been well documented with fishery, survey, and research data. The areas of preferred substrate and depths are widely distributed from coastal areas to approximately the end of the Alaska Peninsula in the south, and running north-westerly nearly to St. Lawrence Island. Yellowfin sole are reported to be found in high densities in some nearshore coastal waters as well as further offshore, and these concentrations are outside the areas surveyed in research surveys, although there is some commercial take of these concentrations, at least in some years.

The previous MSC certification assessment reported growth curve parameters of the von Bertalanffy growth curve for yellowfin sole from 12 years of combined data have been estimated for the age range 3-16 years as follows: L_{inf} (cm)= 35.8; $K=0.147$; $t_0=0.47$ (Moody International 2010). Stock assessments since that publication report some variation in growth parameter, but no systematic trends are apparent, and the variation is well within historical ranges. Thus, the growth curve remains the primary basis for estimating age information, but their treatment in the assessment computations is becoming more sophisticated (see below). Like other flatfish, maturation seems to be size-dependent in yellowfin sole. Estimated age of 50% maturity is 10.5 years at average growth rates based on 1992-1993 survey data. Re-analysis from gonad collection of 2012 show similar results). In the case of most north Pacific flatfish species, including yellowfin sole, sexual maturity occurs well after the age of entry into the fishery. Yellowfin sole females are 82% selected to the fishery by age 10 whereas they have been found to be only 40% mature at this age. Annual natural mortality of adults has been estimated to be about 10% ($M = 0.12$).

As studies accumulate about the impact of oceanographic conditions of BSAI fish, a component of the variation in growth rate of several flatfish species, including yellowfin sole is attributed to variation in water temperature and oceanographic regime. As studies of these regime and regime-like variability in growth parameters continue, there may be opportunity in future to increase the ability to address variation in annual growth within the stock assessments.

Oceanographic conditions have been found to have large effects on recruitment rate for almost all the EBS flatfish where studies have been conducted. However, directed studies of oceanographic conditions on yellowfin sole where not found, and recruitment to yellowfin sole has been relatively stable for some years. Nevertheless both density dependent and independent effects were found to affect their distribution. However, given the ubiquity of such effects in EBS species and the documented effects of oceanographic conditions on growth and distribution, recruitment impacts should not be discounted, although at stock sizes and exploitation rates of recent decades, recruitment variation would not be a major short term factor in assessment or management.

With regard to diets, yellowfin sole appear to be typical of the generalist flatfish feeding on largely soft-bodied benthic infauna and epifauna. They are preyed on by a range of large piscivorous fishes, including Pacific cod and large Alaska Pollock, but no predators have been reported as dependent on juvenile or adult yellowfin sole as a specialized prey.

Southern rock sole (*Lepidopsetta bilineata*). The Southern rock sole is a flatfish of the family Pleuronectidae. It is a demersal fish that lives on sand and gravel bottoms at depths of up to 575 m, though it is most commonly found between 0 and 183 m. Its native habitat is the temperate waters of the northern Pacific, from Baja California to Alaska, the Aleutian Islands and southeastern parts of the Bering Sea. It grows up to 60 cm in length and can weigh up to 1.8 kilograms, and has a maximum recorded lifespan of 22 years. Southern rock sole ranges from the southeast Bering Sea to Baja

California. This species have an overlapping distribution in the GOA with northern rock sole. Southern rock sole spawns in areas where bottom temperatures averaged 6°C in June.

Rex sole (*Glyptocephalus zachirus*). The species is a right-eyed flatfish occurring from southern California to the Bering Sea and ranging from shallow water (<100 m) to about 800 m depth. They are most abundant at depths between 100 and 200 m and are found throughout the GOA, with the highest biomass found in the Central GOA.

Rex sole appear to exhibit latitudinal changes in growth rates and female size at maturity between stocks in the GOA and off the coast of Oregon. Size at sexual maturity was greater for fish in the GOA than in Oregon, as was size-at-age. However, these trends offset each other such that age-at-maturity was similar between the two regions.

Rex sole are batch spawners with a protracted spawning season in the GOA. The spawning season for rex sole spans at least 8 months, from October to May. Eggs are fertilized near the sea bed, become pelagic, and probably require a few weeks to hatch. Hatched eggs produce pelagic larvae that are about 6 mm in length and are thought to spend up to 9 months in a pelagic stage in the northern GOA before settling out to the bottom as 5 cm juveniles. Rex sole are found offshore in the GOA during the spawning season and larvae are broadly distributed over the slope and shelf. Rex sole are one of several GOA flatfish species with larvae that exhibit cross-shelf transport, moving to several nearshore nursery areas where they remain as juveniles. Several flatfish species in the GOA, including rex sole, Dover sole, Pacific halibut, and arrowtooth flounder have shown synchrony in recruitment patterns over time that have been linked to an environmental indicator related to sea surface height.

Rex sole are benthic feeders, preying primarily on amphipods, polychaetes, and some shrimp. In 1993 rex sole was split out of the deep-water management category because of concerns regarding the Pacific ocean perch bycatch in the rex sole target fishery. The stock within the GOA is managed as a unit stock but with area-specific ABC and TAC apportionments to avoid the potential for localized depletion. Little is known on the stock structure of this species. However, otoliths exhibit two distinct growth patterns and data shown in this assessment show that length older ages in the Eastern GOA is smaller than those for the Western and Central areas.

Greenland turbot (*Reinhardtius hippoglossoides*). This flatfish has a circumpolar distribution inhabiting the North Atlantic, Arctic and North Pacific Oceans. The American Fisheries Society uses “Greenland halibut” as the common name for *Reinhardtius hippoglossoides* instead of Greenland turbot. To avoid confusion with the Pacific halibut, *Hippoglossus stenolepis*, the common name Greenland turbot, which is also the “official” market name in the US and Canada, is retained.

In the Pacific Ocean, Greenland turbot have been found from the Sea of Japan to the waters off Baja California. Specimens have been found across the Arctic in both the Beaufort and Chukchi seas. This species primarily inhabits the deeper slope and shelf waters (between 100 m to 2,000 m) in bottom temperatures ranging from -2°C to 5°C. The area of highest density of Greenland turbot in the Pacific Ocean is in the northern Bering Sea. Juveniles are believed to spend the first 3 or 4 years of their lives on the continental shelf and then move to the continental slope. Adult Greenland turbot distribution in the Bering Sea appears to be dependent on size and maturity as larger more mature fish migrate to deeper warmer waters. In the annual summer shelf trawl surveys conducted by the Alaska Fisheries Science Center (AFSC) the distribution by size shows a clear preference by the smaller fish for shallower (< 100 m) and colder shelf waters (< 0°C). The larger specimens were in higher concentrations in deeper (> 100 m), warmer waters (> 0°C). It appears that for years with above average bottom trawl bottom temperatures the larger turbot (> 20 cm) are found at shallower depths. Juveniles are generally absent in the Aleutian Islands regions, suggesting that the population in the Aleutians originates from the EBS or elsewhere. In this assessment, Greenland turbot found in the two regions are assumed to represent a single management stock. NMFS initiated a tagging study in 1997 to supplement earlier international programs. Results from conventional and archival tag return data suggest that individuals can range distances of several thousands of kilometers and spend summer periods in deep water in some years and in other years spend time on the shallower EBS shelf region. Greenland turbot are sexually dimorphic with females achieving a larger maximum size and having a faster growth rate. Data from the AFSC slope and shelf surveys were pooled to obtain weight at length and growth parameters for both male and female Greenland turbot. This sexually dimorphic growth is consistent with trends observed in the North Atlantic. Collections in the North Atlantic suggest that males may have higher mortality than females. Evidence from the Bering Sea shelf and slope surveys suggest males reach a maximum size much smaller than females, but that mortality may not be higher than in females. Prior to 1985 Greenland turbot and arrowtooth flounder were managed together. Since then, the Council has recognized the need for separate management quotas given large differences in the market value between these species. Furthermore, the abundance trends for these two species are clearly distinct.

4.2 Fishery operations

The Alaska flatfish fisheries are conducted in the U.S. exclusive economic zone (EEZ) waters of the BSAI and GOA. The BSAI is bordered by Alaska, the Bering Strait, and northeastern Siberia to the north and by the Alaska Peninsula, Aleutian Islands, and Commander Islands to the south. It covers over 2 million km² 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.

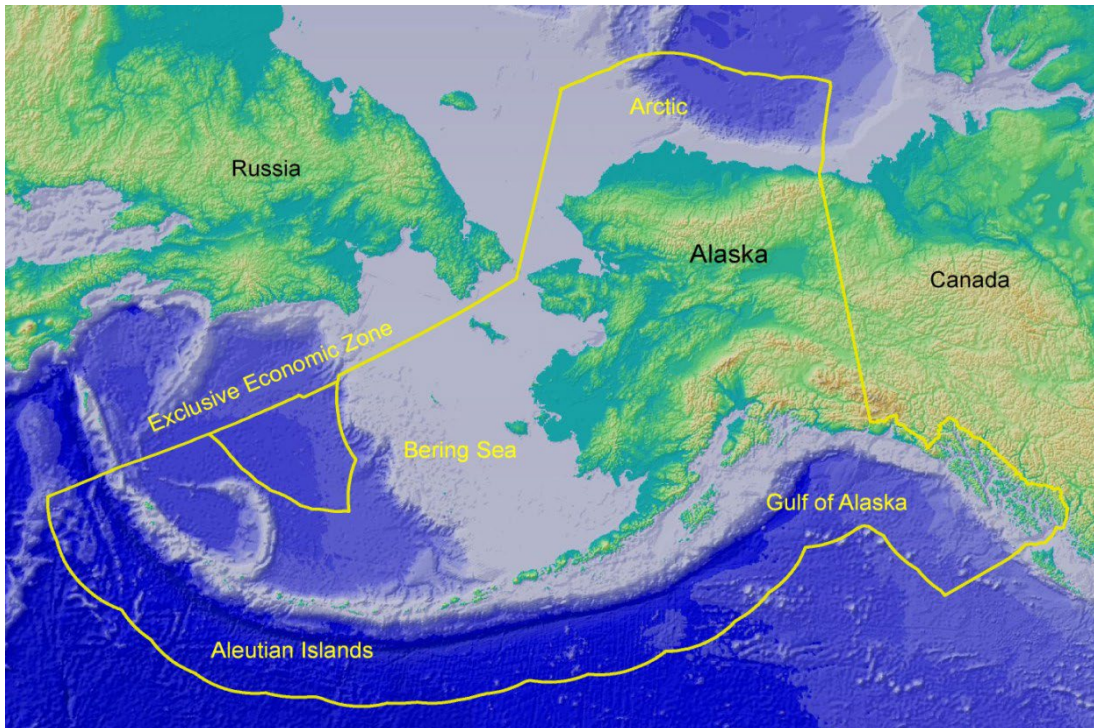


Figure 1 The U.S. EEZ of the BSAI and GOA. Source: NPFMC 2012

The Alaska Seafood Cooperative (AKSC), located in Seattle, WA, is the client group for these fisheries. AKSC is a group of 'catcher processor' fishing companies that are interested in working to improve the management of Bering sea flatfish and other non-pollock groundfish fisheries. The AKSC comprises of five seafood member companies, with approximately 17 vessels that participate in these fisheries. Alaska flatfish are harvested by commercial demersal and pelagic trawl gear. All vessels participating in the BSAI and GOA groundfish fisheries, with exception of fixed gear sablefish, are required to have a Federal groundfish license, endorsed with area, gear and vessel type and length designations (NPFMC, 2020). An annual TAC is established for these stocks, based on an annual Stock Assessment and Fishery Evaluation (SAFE) report. The fleet consists of catcher vessels delivering to shore, catcher vessels (CV) delivering to motherships that process the catch, and at-sea catcher-processor (CP) vessels.

The commercial FMP groundfish fisheries off Alaska had a total catch of 2.01 million metric tons (mt) in 2021 (including catch in federal and state waters) and accounted for about 81.84% of the total 2021 catch in Alaska (Abelman et al., 2023). Alaska's groundfish fishery is an important component of the total U.S. catches and accounted for 38% by weight of the total U.S. domestic landings (Abelman et al., 2023). 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.

4.3 Management system

The Alaska flatfish complex fishery is conducted in the U.S. EEZ waters of the BSAI and GOA. The principle legislative instrument for fisheries management in the U.S. is the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSFCMA, herewith MSA) and is implemented by the NMFS. The North Pacific Fishery Management Council, (NPFMC or Council) is one of eight regional councils established by the MSA 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. The Council works 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). In coastal waters off the U.S., the Alaska flatfish is under the jurisdiction of the BSAI FMP, GOA Groundfish FMP, and the MSA. In addition to the MSA, the Council adheres to a suite of "other applicable laws": National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), Migratory Bird Treaty Act (MBTA), the Administrative Procedure Act (APA), Paperwork Reduction Act, Regulatory Flexibility Act, and Coastal Zone Management Act (CZMA) and other relevant U.S. laws, Executive Orders (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 Alaska flatfish 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 MSA, 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. In addition to the National Standard Guidelines, the Council has established nine specific objectives, each with several sub-objectives, for BSAI and GOA groundfish fisheries in Alaska. These objectives include: 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 groundfish fisheries, including flatfish, 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 BSAI 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. Both the BSAI and GOA FMPs have been amended over 100 times (NPFMC 2020a; 2020b).

BSAI FMP

The BSAI Groundfish FMP was adopted by the Council in 1980 and implemented in 1982. The FMP has been amended 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 W. longitude and the U.S.-Russian Convention Line of 1867 (NPFMC, 2020). 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, 2020). 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 summary of these actions can be found at the following link: [BSAI Groundfish FMP Summaries \(2016\)](#).

GOA FMP

The GOA FMP was implemented on December 1, 1978 and 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 2020b). The focus of the FMP has changed from the regulation of foreign fisheries to the management of fully domestic groundfish fisheries (NPFMC 2020b). 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 list of these amendments, similar to that prepared for the BSAI, can be found at the following link: [GOA Groundfish Summaries \(2019\)](#).

4.3.1 Roles, responsibilities and decision-making processes

The NPFMC consists of 11 voting members, including: 7 appointed members, 4 agency representatives (6 from Alaska, 3 from Washington, 1 from Oregon, and 1 from NMFS). There are also 4 non-voting members that include representatives from the U.S. Fish and Wildlife Service (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 ~7 days. All meetings are open to the public, except for an occasional short, closed session in which the Council deals with personnel, administrative, or litigation issues. Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. There is also a Science and Statistical Committee (SSC), Advisory Panel (AP), Plan Teams, and other committees that provide input to the Council at each meeting (NPFMC, 2023).

SSC

As required by the MSA at Sec. 302(g)(1), the Council shall establish, maintain, and appoint the members of an 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, 2023, MRAG, 2020).

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 U.S. will utilize resources managed by the Council's FMPs (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, 2023).

Groundfish Plan Teams (adapted from MRAG, 2020)

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 proposals and routine management decisions, if 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, 2023). 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. The following figure illustrates the Council process from proposal to implementation.

The Council process from proposal to implementation

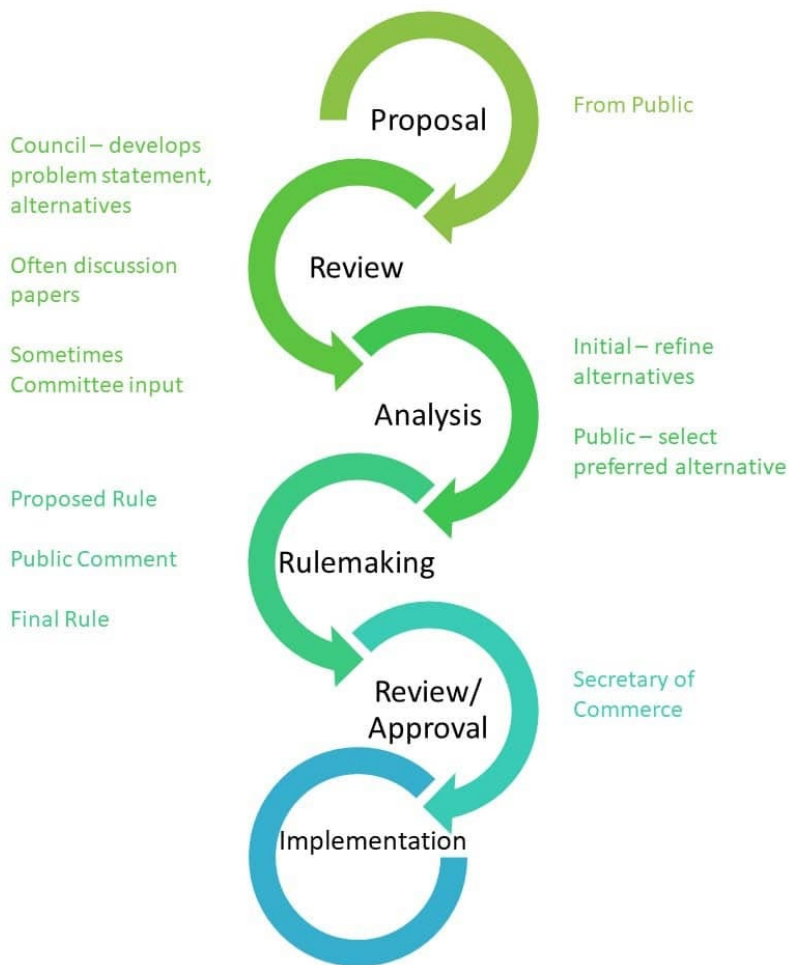


Figure 2 NPFMC process from proposal to implementation. Source: NPFMC, 2023

4.3.2 Consultation

Accountability and transparency of the management system is required by multiple laws and Executive Orders. The National Standard (NS) Guidelines for National Standard 2 specifically require transparency in the provision of scientific information for fishery management. Under the heading “Transparency and openness,” the NS Guidelines state that: “The Magnuson-Stevens Act provides broad public and stakeholder access to the fishery conservation and management process, including access to the scientific information upon which the process and management measures are based. Public comment should be solicited at appropriate times during the review of scientific information. Communication with the public should be structured to foster understanding of the scientific process.”. They further require that: “Scientific information products should describe data collection methods, report sources of uncertainty or statistical error, and acknowledge other data limitations. Such products should explain any decisions to exclude data from analysis. Scientific products should identify major assumptions and uncertainties of analytical models. Finally, such products should openly acknowledge gaps in scientific information” (NOAA, 2018).

The Council’s mandate is to manage and conserve fisheries for the greatest overall benefit of the nation by relying on scientific information and data, as well as the participation of fishing communities and the public. In accordance with the MSA, the Council has functions and responsibilities that are outlined in the Statement of Organization, Practices and Procedures (SOPP). The SOPP specifies how the Council and its advisory entities will run their meetings including how public comments will be entertained. These functions and roles pertaining to the consultation process are summarized below (NPFMC, 2023b):

- The agenda for each Council meeting is drafted by the Executive Director in consultation with the Council Chair. All Council members will have an opportunity to review and comment on a draft agenda before it is released to the public.
- Timely notice of each regular meeting, hearing, and each emergency meeting, including the time, place, and agenda of the meeting, shall be provided by any means that will result in wide publicity in the major fishing ports of the region (and in other major fishing ports having a direct interest in the affected fishery) except that

e-mail notification and website postings alone are not sufficient. Timely notice of each regular meeting shall also be published in the Federal Register.

- Each regular meeting and each emergency meeting shall be open to the public. Interested persons shall be permitted to present oral or written statements regarding the matters on the agenda at meetings, within reasonable limits established by the Chair. Written comments can be provided electronically in advance of the Council meeting; directions on submitting comments, and deadlines for posting comments, are posted on the Council website www.npfmc.org.
- A report of each meeting of the Council, except for any closed session, shall be kept and contain a record of the persons present, a complete and accurate description of matters discussed, and conclusions reached, and copies of all statements filed. The summary report, combined with the detailed newsletter, time log, and audio/visual recordings of the meeting, are intended to meet the requirements for minutes as described in Section 302(i)(2)(E) of the MSA.
- 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 Act. 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.

4.3.3 Regulatory framework

The U.S. measures for regulating the BSAI and GOA fisheries are found in [50 CFR 600](#) and [50 CFR 679](#). Gear types authorized by the FMP are trawls, hook-and-line, pots, jigs, and other gear as defined in regulations. The fishery is primarily managed by required licenses and/or permits, fishing seasons, annual TACs, closed areas, catch restrictions. Annually, the Council develops harvest specifications based on information from the Groundfish Plan Teams, SSC, AP, the public, and any other relevant information. Harvest specifications include overfishing limit, acceptable biological catch (ABC), total allowable catch (TAC), ABC surplus and ABC reserve. Final harvest specifications are implemented by mid-February each year to replace those in effect for that year and based on new information contained in the latest groundfish SAFE reports. Current harvest specifications can be found at the following link: <https://www.npfmc.org/fisheries-issues/issues/harvest-specs/>.

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-American Fisheries Act (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).

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. Crew members 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.

Essential Fish Habitat Components

To incorporate the regulatory guidelines for review and revision of essential fish habitat (EFH) FMP components, the Council will conduct a complete review of all the EFH components of each FMP once every 5 years and will amend those EFH components as appropriate to include new information. During the NPFMC February 2023 meeting, The Council reviewed the summary report of a 5-year review of essential fish habitat (EFH) components of the Council's FMPs, and initiated an analysis at this meeting to update the Council's BSAI Groundfish, GOA Groundfish, BSAI King and Tanner Crab, Salmon, and Arctic FMPs' descriptions and maps of EFH. The Council elected not to initiate additional habitat-specific processes at this time (NPFMC, 2023).

Updates to Regulations and the Fishery Management Plans

NOAA Fisheries issued the final rule to implement Amendment 123 to the BSAI FMP. This final rule amends the regulations governing limits on Pacific halibut (*Hippoglossus stenolepis*) prohibited species catch (PSC) to link the halibut PSC limit for the Amendment 80 commercial groundfish trawl fleet in the BSAI groundfish fisheries to halibut abundance. This is necessary to comply with the MSA that FMPs minimize bycatch to the extent practicable. Effective date of the final rule was January 1, 2024.

The NPFMC submitted to the Secretary of Commerce for review, Amendment 113 to the GOA FMP, which would modify specific provisions for the central GOA Rockfish Program (RP) to change the season start date, remove the catcher vessel (CV) cooperative holding cap, and revise the processing and harvesting caps implemented in the RP. These actions are necessary to provide increased flexibility and efficiency to better ensure the rockfish species TAC is fully harvested and landed in Kodiak. This is currently a Proposed Rule (50 CFR 679).¹

The NPFMC reviewed the FMP omnibus amendment analysis and proposed FMP amendment text based on the 2023 EFH 5 year Review. The Council took final action and selected Alternative 2, which is summarized as follows:

Alternative 2, the preferred alternative, will update the EFH information in the BSAI & GOA groundfish, BSAI crab and Arctic FMPs. These updates include updated EFH maps, text descriptions, results of the fishing effects (FE) on habitat, prey species tables, non-fishing effects report and research and information needs (NPFMC, 2023).

4.3.4 Monitoring, control and surveillance

The North Pacific fisheries has a comprehensive, industry-funded, at-sea and on-shore Observer Program. This is coupled with requirements for total weight measurement of most fish harvested. All sectors of the groundfish fishery may be required to carry one or more observers or an electronic monitoring system for at least a portion of their fishing time. All groundfish vessels and processors are included in one of two coverage categories: partial and full.

Monitoring is done by the North Pacific Observer Program and requires full observer coverage on Alaska groundfish vessels. The BSAI and GOA Groundfish FMPs (NPFMC 2020, 2020b) 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.

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.

¹ <https://www.federalregister.gov/documents/2024/04/04/2024-07115/fisheries-of-the-exclusive-economic-zone-off-alaska-amendment-113-to-the-fishery-management-plan-for#:~:text=If%20approved%2C%20Amendment%20113%20would,caps%20implemented%20in%20the%20RP.>

There are three entities that provide enforcement for Alaska fisheries: NOAA Office of Law Enforcement (OLE), US Coast Guard (USCG) and Alaska Wildlife Troopers (AWT). Monitoring, control, and surveillance (MCS) is carried out at-sea and shore-side for the federal fisheries by the OLE and the USCG. The AWT fulfils the MCS function for the state water fisheries.

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, 2019). 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 NOAA Fisheries—maximizing productivity of sustainable fisheries and fishing communities and protection, recovery, and conservation of protected species.

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 (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).

The USCG is the primary agency for at-sea fisheries enforcement. The USCG objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The USCG use a software package (FishTactic) to assess risk of infringements and use this enforcement tool to assist the deployment of vessels and aircraft and target fisheries enforcement effort. If the USCG detect a fisheries infringement they gather evidence and hand over the investigation to the OLE.

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 2023). 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 2023).

The Cooperative Enforcement Program is a partnership with the federal and state agencies that increases the enforcement activities and promotes compliance with federal laws and regulations. The program uses two main tools:

1. Cooperative Enforcement Agreements – authorize state and US territorial marine conservation law enforcement officers to enforce federal laws and regulations.
2. Joint Enforcement Agreement (JEA) – include formal operation plans that transfers funds to state and US territorial law enforcement agencies to perform law enforcement services in support of federal regulations (NOAA, 2021). The purpose of the JEA between NOAA-OLE and the AWT is to support enforcement of Federal laws and regulations under the MSA, ESA, MMPA, Lacey Act, and Northern Pacific Halibut Act.

In the OLE Alaska Enforcement Division Report to NPFMC (December 2023), AWT recorded the following actions in direct support of OLE and marine resource protection:

- 339 vessels boarded (commercial, charter, sportfish, and subsistence)
- 946 contacts (industry and public) during the execution of field operations
- 1,671 additional contacts through 11 outreach activities
- Completed cases involving 6 Federal violations, 21 State warnings, and 30 State citations (most often jointly, state/federal managed fisheries)
- Referred 5 cases to OLE for potential/confirmed Federal violations (Primary OLE authority enforcement actions) (NOAA, 2023c).

OLE agents/officers have the option to provide a written warning for minor offences however, these are taken into account for repeat offenders. More serious offences can be dealt with by a summary settlement, i.e. a violation which is not contested and results in a ticket which may include a discounted fine, thus allowing the violator to quickly resolve the case without incurring legal expenses. Thereafter, an offence is referred to NOAA's OGC for Enforcement and Litigation which can impose a sanction on the vessels permit or further refer the case to the US Attorney's Office for criminal proceedings. Penalties may range from severe monetary fines, forfeiture of catch, boat seizure and/or

imprisonment. The MSA has an enforcement policy section (50 CFR 600.740) that details these “remedies for violations” (MSA, 2007).

The Council follows the same enforcement procedures outlined by NOAA Fisheries OLE. There is a strong enforcement program to deter fisheries violations through successful prosecution and deterrent penalties. NOAA has authority and responsibility under more than 30 federal statutes to manage sustainable fisheries, and to protect living marine resources, including marine areas and species (NOAA Policy for Assessment of Penalties and Permit Sanctions – March 16, 2011, 56pp). Officers and agents in the NOAA OLE, the USCG, Customs and Border Protection, Immigration and Customs Enforcement, USFWS, and State officers authorized under Cooperative Enforcement Agreements, monitor compliance and investigate potential violations of the statutes and regulations enforced by NOAA. Monitoring, control and surveillance are carried out across the fishing sectors to ensure observance of regulatory and statute requirements. 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

The Code of Federal Regulations list the sanctions to deal with non-compliance. Penalties for fisheries related violations include fines; permit cancellations or suspensions, permanent prohibitions on participation in the fishery, 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.

4.4 Stock assessment and reference points

Information for assessing the status of flatfish come from the SAFE reports (see: <https://www.fisheries.noaa.gov/tags/north-pacific-groundfish-stock-assessments>).

Catches of BSAI and GOA flatfish continue to be constrained by halibut bycatch limits as fishermen make fishing decisions at all times throughout the year to avoid halibut. The 12 stocks considered in the present reassessment report are above MSY level both in BSAI and in GOA (Figure 3 and Figure 4 and the following paragraph by stock).

Bering Sea and Aleutian Islands

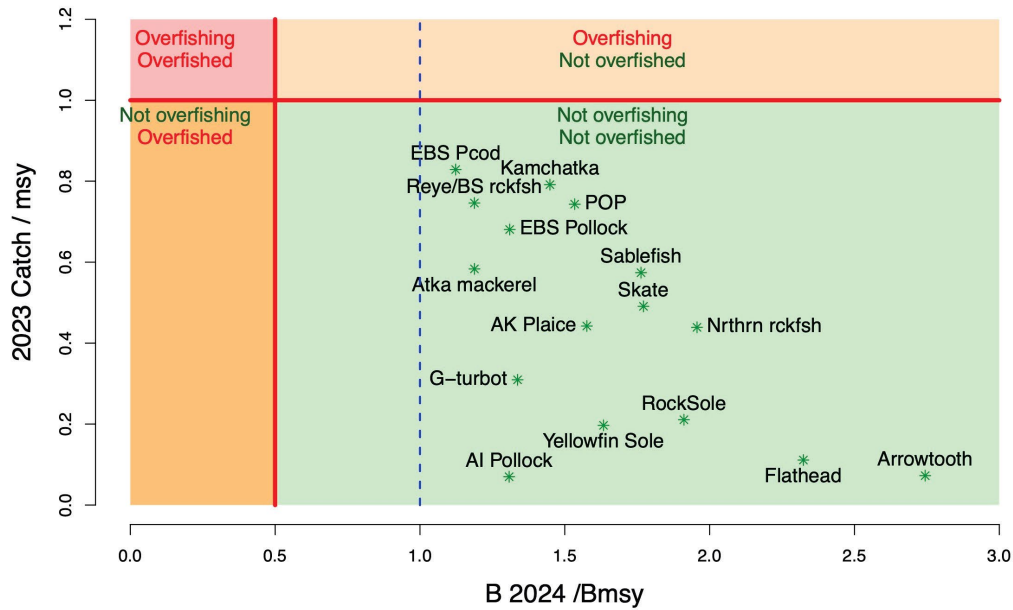


Figure 3. Summary of Bering Sea stock status next year (spawning biomass relative to B_{MSY} ; horizontal axis) and current year catch relative to fishing at F_{MSY} (vertical axis) where FOFL is taken to equal F_{MSY} . Source: Aydin et al., 2023.

Gulf of Alaska

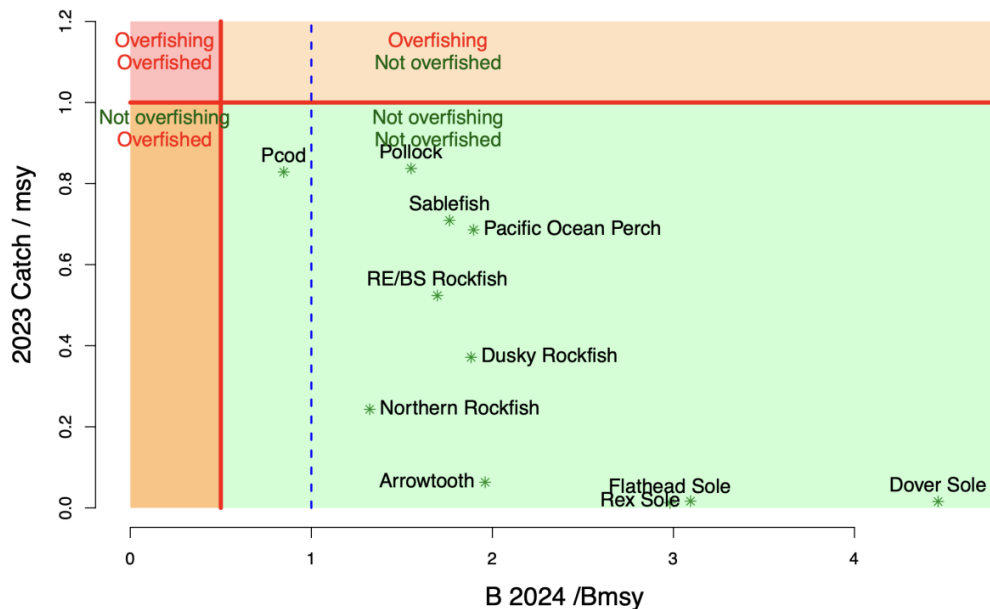


Figure 4. Summary of Gulf of Alaska stock status next year (spawning biomass relative to B_{MSY} ; horizontal axis) and current year catch relative to fishing at F_{MSY} (vertical axis). Note that sablefish is for Alaska-wide values including the BSAI catches. Source: Adams et al., 2023.

The scheduled frequency for some flatfish stock assessments was recently changed in response to a review of the National Stock Assessment Prioritization effort (Methot, 2015; Hollowed et al., 2016). In previous years, BSAI and GOA flatfish stocks were assessed on a biennial stock assessment schedule to coincide with the availability of new survey data. Following the prioritization review, it was recommended that BSAI and GOA flatfish change to a

quadrennial stock assessment schedule with a full stock assessment produced every four years and a harvest projection produced in alternate years.

BSAI arrowtooth flounder

For 2023 off-cycle year, the harvest projection assessment is presented in Shotwell et al. (2023a). Shotwell et al. (2022) present the last full SAFE.

Statistical age-structured model as the primary assessment tool for the BSAI arrowtooth flounder stock is routinely used, 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. The data sets used in this assessment include total catch biomass, fishery size compositions, bottom trawl survey biomass estimates, bottom trawl survey age compositions, and bottom trawl survey size compositions when age compositions are not available. For an off-cycle year, the projection model with new catch information is updated. This incorporates the most current catch information without re-estimating model parameters and biological reference points. There were no changes from the 2022 assessment model (Shotwell et al., 2022) as 2023 is an off-cycle year. New data added to the projection model included updated catch data from 2021-2022 and new estimated catches for 2023-2025.

The projected total biomass for 2024 is 921,062 t. The recommend ABC for 2024 is 87,690 t, the maximum allowable ABC under Tier 3a. This ABC is a 4.6% increase compared to the 2023 ABC of 83,852 and a 0.2% increase from the projected 2024 ABC from the last year’s assessment. The 2024 BSAI OFL for arrowtooth flounder is 103,280 t.

Reference values for arrowtooth flounder are summarized in Table 1. The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished. The tests for evaluating these three statements on status determination require examining the official total catch from the most recent complete year and the current model projections of spawning biomass relative to B35% for 2023 and 2025. The official total catch for 2022 is 7,857 t, which is less than the 2022 OFL of 94,445 t; therefore, the stock is not being subjected to overfishing. The estimates of spawning biomass for 2023 and 2025 from the current year (2023) projection model are 514,817 t and 559,145 t, respectively. Both estimates are well above the estimate of B35% at 196,427 t.

Table 1. BSAI arrowtooth flounder assessment outputs. Source: Shotwell et al., 2023a

Quantity/Status	As estimated or specified last year for:		As estimated or recommended this year for:	
	2023	2024	2024*	2025*
M (natural mortality)**	0.2, 0.35	0.2, 0.35	0.2, 0.35	0.2, 0.35
Tier	3a	3a	3a	3a
Projected total (age 1+) biomass (t)	929,274	919,797	921,062	907,809
Projected female spawning biomass (t)	514,577	537,999	539,030	559,145
B _{100%}	561,219	561,219	561,219	561,219
B _{40%}	224,487	224,487	224,487	224,487
B _{35%}	196,427	196,427	196,427	196,427
F _{OFL}	0.174	0.174	0.174	0.174
maxF _{ABC}	0.146	0.146	0.146	0.146
F _{ABC}	0.146	0.146	0.146	0.146
OFL (t)	98,787	103,070	103,280	104,270
maxABC (t)	83,852	87,511	87,690	88,548
ABC (t)	83,852	87,511	87,690	88,548
Status	As determined last year for:		As determined this year for:	
	2022	2023	2023	2024
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 7,175 t for 2023 and estimates of 10,701 t and 9,689 t used in place of maximum permissible ABC for 2024 and 2025.

**Natural mortality rate is 0.2 for females, 0.35 for males.

Catch of arrowtooth flounder decreased in the Bering Sea but increased in the Aleutian Islands in 2023 compared to 2022. The Bering Sea catch is the lowest in the time series while the Aleutian Islands is slightly below the long-term mean. About 48% of the catch was in the Arrowtooth and Kamchatka flounder fishery, 26% in the yellowfin sole, flathead sole, and other flatfish fisheries, 9% in the rockfish fisheries, 8% in the Pacific cod fishery, 3% in the sablefish fishery, and 3% in the pollock fishery.

The AFSC EBS bottom trawl shelf survey was conducted in 2023. The EBS arrowtooth flounder biomass estimate was 462,575 t for 2023, which was 11% lower than the 2022 survey, but slightly above the long-term average for the time series.

GOA arrowtooth flounder

For 2023 off-cycle year, the harvest projection assessment is presented in Shotwell et al. (2023b). Shotwell et al. (2021) present the last full SAFE.

A statistical age-structured model as the primary assessment tool for the GOA arrowtooth flounder stock is used, 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. The data sets used in this assessment include total catch biomass, fishery size compositions, bottom trawl survey biomass estimates, bottom trawl survey age compositions, and bottom trawl survey size compositions when age compositions are not available. For an off-cycle year, the projection model with new catch information is updated. This incorporates the most current catch information without re-estimating model parameters and biological reference points.

There were no changes from the 2021 assessment model (Shotwell et al., 2021) as this is an off-cycle year. New data added to the projection model included updated catch data from 2021-2022 and new estimated catches for 2023-2025.

The projected total biomass for 2024 is 1,295,410 t. The recommend ABC for 2024 is 119,249 t, the maximum allowable ABC under Tier 3a. This ABC is a 0.2% decrease compared to the 2023 ABC of 119,485 and a 1% increase from the projected 2024 ABC from the last year's assessment. The 2024 GOA-wide OFL for arrowtooth flounder is 142,485 t.

Reference values for arrowtooth flounder are summarized in Table 2. The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished. The tests for evaluating these three statements on status determination require examining the official total catch from the most recent complete year and the current model projections of spawning biomass relative to B35% for 2023 and 2025. The official total catch for 2022 is 11,631 t, which is less than the 2022 OFL of 143,100 t; therefore, the stock is not being subjected to overfishing. The estimates of spawning biomass for 2023 and 2025 from the current year (2023) projection model are 696,871 t and 695,299 t, respectively. Both estimates are well above the estimate of B35% at 356,544 t.

Table 2. GOA Arrowtooth flounder assessment outputs. Source: Shotwell et al., 2023b

Quantity/Status	As estimated or <i>specified</i>		As estimated or	
	2023	2024	2024*	2025*
M (natural mortality)	0.2	0.2	0.2	0.2
Tier	3a	3a	3a	3a
Projected total (age 1+) biomass (t)	1,265,950	1,269,510	1,295,410	1,311,810
Projected female spawning biomass (t)	702,074	690,799	698,842	695,299
B _{100%}	1,018,700	1,018,700	1,018,700	1,018,700
B _{40%}	407,478	407,478	407,478	407,478
B _{35%}	356,544	356,544	356,544	356,544
F _{OFL}	0.225	0.225	0.225	0.225
maxF _{ABC}	0.185	0.185	0.185	0.185
F _{ABC}	0.185	0.185	0.185	0.185
OFL (t)	142,749	141,008	142,485	142,074
maxABC (t)	119,485	118,014	119,249	118,912
ABC (t)	119,485	118,014	119,249	118,912
Status	As determined <i>last</i> year for:		As determined <i>this</i> year for:	
	2022	2023	2023	2024
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 9,029 t for 2023 and estimates of 17,576 t and 15,516 t used in place of maximum permissible ABC for 2024 and 2025.

Catch of arrowtooth flounder decreased in all areas except west Yakutat where it stayed the same in 2023 compared to 2022. The central GOA catch is the lowest in the time series while catch in the other areas were all well below the long-term mean. About 76% of the catch was in the arrowtooth flounder fishery, 9% in the rockfish fisheries, 8% in the pollock fishery, 2% in the sablefish fishery, 1% in the Pacific cod fishery, and the remainder in other flatfish fisheries. Currently, “off-year” assessments are required to present a catch to biomass ratio, which is calculated as the catch divided by the total age 1+ biomass from the assessment model and for 2022 and 2023 total biomass is used from the projection model (Shotwell et al. 2021).

The AFSC GOA bottom trawl survey was conducted in 2023. The GOA arrowtooth flounder biomass estimate was 1,192,608 t for 2023, which was 5% higher than the 2021 survey, but still below the long-term average for the time series. Geostatistical model (vector autoregressive spatio-temporal or VAST with lognormal observation error) estimates were also provided for arrowtooth flounder from the GOA bottom trawl survey. These estimates were very similar in trend to the design-based estimates but had reduced error over most years.

BSAI Kamchatka Flounder

BSAI Kamchatka flounder are assessed biennially according to the stock assessment prioritization schedule. A forward projecting age structured model is the primary assessment tool for BSAI Kamchatka flounder, which qualifies as a Tier 3 stock. The assessment model is not run during an off-cycle year as 2023 (Bryan, 2023a). During odd years, a harvest projection is presented with recommendations of harvest levels for the next two years for this species, using updated catch information in the projection model. The most recent full assessment was conducted in 2022, information regarding the stock assessment model and results is available online (Bryan et. al, 2022). A full stock assessment document with updated assessment and projection model results is scheduled for November, 2024

New data added to the projection model included an updated 2022 catch of 8,369 t and new catch estimates for 2023-2025. Based on the projection model results, recommended ABCs for 2024 and 2025 are 7,498 t and 7,360 t. The recommended OFLs are 8,850 t and 8,687 t for 2024 and 2025, respectively. The new ABC and OFL recommendations for 2024 are similar to the 2023 ABCs and OFL developed using the 2022 full assessment model. The stock is not overfished, and is not approaching a condition of being overfished. The results are presented in Table 3.

Table 3. BSAI Kamchatka flounder assessment outputs. Source: Bryan, 2023a

Quantity	Tier 3 assessment model			
	As estimated last year for		As estimated this year for	
	2023	2024	2024	2025
<i>M</i> (natural mortality rate)	0.11	0.11	0.11	0.11
Tier	3a	3a	3a	3a
Projected total (age 2+) biomass (t)	121,977	118,713	119,565	116,651
Projected female spawning biomass	47,877	47,387	47,849	47,330
Projected				
<i>B</i> _{100%}	94,370	94,370	94,370	94,370
<i>B</i> _{40%}	37,748	37,748	37,748	37,748
<i>B</i> _{35%}	33,029	33,029	33,029	33,029
<i>F</i> _{OFL}	0.103	0.103	0.103	0.103
<i>maxF</i> _{ABC}	0.086	0.086	0.086	0.086
<i>F</i> _{ABC}	0.086	0.086	0.086	0.086
OFL (t)	8,946	8,776	8,850	8,687
maxABC (t)	7,579	7,435	7,498	7,360
ABC (t)	7,579	7,435	7,498	7,360
Status	As determined last year for:		As determined this year for:	
	2021	2022	2022	2023
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 model 16.0b. Catch in 2022 was updated to 8,369 t and preliminary catches for 2023 - 2025 were set to 7,080 t. The preliminary catch was estimated as the product of an expansion factor and the reported catch as of September 27, 2023.

Survey biomass on the EBS shelf continues to decline and in 2023 decreased of 16% in relation to 2022. Exploitation slightly declined in 2023, but has been generally increasing since 2018.

BSAI Yellowfin sole

Spies et al. (2023) have carried out the last assessment of BSAI yellowfin sole. Several models were tested, that incorporate the following new data and changes since the last full assessment in 2022:

- The 2022 fishery age compositions were added.
- The 2022 VAST survey age compositions were added.
- The estimate of the total catch made through the end of 2022 was updated as reported by the NMFS Alaska Regional office. The catch through the end of 2023 was estimated based on available data to be 79,688 t. Catch for the 2024 and 2025 projections were assumed to be the mean of the past 5 years, 2019 - 2023, 121,103 t.
- The 2023 NMFS survey biomass estimate and standard error were included. Model-based (VAST) estimate of the EBS and Northern BS (NBS) biomass and standard error were used in all models presented.

Two models were presented by Spies et al. (2023). Model 22.1 was the accepted model in 2022 and is presented with updated data. Model 23.0 is based on Model 22.1, except that a single sex time-varying fishery selectivity was used rather than separate time-varying fishery selectivities for males and females

The models presented in this assessment include interpolated survey bottom temperature within the summer bottom trawl area < 100 m as a covariate on survey catchability, as well as NMFS EBS survey start date and the interaction of start date and temperature (Nichol et al. 2019). These models also specify female natural mortality to be fixed at 0.12 while allowing the model to estimate male natural mortality. All models use model-based (VAST) survey indices and age compositions from the combined EBS and NBS survey areas.

In the EBS bottom trawl survey performed in 2023, the yellowfin sole model-based biomass estimate was 32% lower than estimated by the 2022 EBS bottom trawl survey, at 2,007,140 t. Spawning biomass estimated by Model 23.0 was 1.63 * BMSY. Therefore, yellowfin sole continues to qualify for management under Tier 1a. The 1978-2017 age-1 recruitments and the corresponding spawning biomass estimates were used to fit the stock recruitment curve and determine the Tier 1 harvest recommendations. Tier 3 estimates were also calculated, which is typical for this assessment. This assessment updates last year’s model with total and spawning biomass estimates for 2023 that are lower than the 2022 estimates for 2023. 2023 year’s recommended ABC and OFL are lower than the 2022 assessment, coincident with a decrease in the 2023 survey biomass estimate.

Yellowfin sole female spawning biomass continues to be above BMSY and the annual harvest remains below the ABC level. Management quantities are given in Table 4 for the 2022 accepted model and the 2023 preferred model. The projected estimate of total biomass for 2024 was lower by 38% from the 2022 assessment of 4,062,230 t, to 2,512,810 t. The model projection of spawning biomass for 2024, assuming catch for 2023 as described above, was 881,640 t, 2% lower than the projected 2024 spawning biomass from the 2022 assessment of 897,062 t. The 2024 and 2025 ABCs using F_{ABC} from this assessment model were lower than last year’s 2024 ABC of 462,890 t; 265,913 t and 276,917 t. The 2024 and 2025 OFLs estimated were 305,298 t and 317,932 t.

Table 4. BSAI Yellowfin sole assessment outputs. Source: Spies et al., 2023

Quantity	As estimated or <i>specified</i> last year for:		As estimated or <i>recommended</i> this year for:	
	2023	2024	2024	2025
M (natural mortality rate)	0.12, 0.125	0.12, 0.125	0.12, 0.137	0.12, 0.137
Tier	1a	1a	1a	1a
Projected total (age 6+) biomass (t)	3,321,640 t	4,062,230 t	2,512,810 t	2,616,800 t
Projected female spawning biomass (t)	885,444 t	897,062 t	881,640 t	857,354 t
B_0	1,407,000 t	1,407,000 t	1,516,980 t	1,516,980 t
B_{MSY}	475,199 t	475,199 t	539,657 t	539,657 t
F_{OFL}	0.122	0.122	0.121	0.121
$maxF_{ABC}$	0.114	0.114	0.106	0.106
F_{ABC}	0.114	0.114	0.106	0.106
OFL (t)	404,882 t	495,155 t	305,298 t	317,932 t
$maxABC$	378,499 t	462,890 t	265,913 t	276,917 t
ABC (t)	378,499 t	462,890 t	265,913 t	276,917 t
Status	2021	2022	2022	2023
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Two elements of the Risk Table, Population dynamics and Environmental/ecosystem components were rated as level 2, "Major concern". The other Risk Table elements were rated as level 1, "No concern". There were no recommended reductions in ABC.

BSAI Northern rock sole

Northern rock sole (*Lepidopsetta polyxystra*) are assessed on a biennial stock assessment schedule as part of the NMFS assessment prioritization plan implemented in 2017. For BSAI partial assessments was carried out in 2023 (McGilliard, 2023a). The last year's full stock assessment report is presented in McGilliard et al. (2022).

A statistical age-structured model is used as the primary assessment tool for the BSAI northern rock sole assessment, a Tier 1 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. The data sets used in this assessment include total catch biomass, fishery age compositions, trawl survey abundance estimates and trawl survey age compositions. In a partial assessment year as the 2023, the full assessment model is not rerun but instead a Tier 1 projection model with an assumed future catch is used to estimate the stock level in the next two years. This incorporates the most current catch information for ABC and OFL recommendations without re-estimating model parameters and biological reference points.

The Tier 1 projection operates within the full assessment model by projecting estimates of the female spawning biomass, age 6+ total biomass, ABC and OFL ahead two years. Since the full assessment model is not rerun in this assessment, the projected values from the 2022 assessment are used to provide ABC and OFL.

The 2022 catch was updated to realized year-end catch (18,399 t), which was larger than the projected 2022 catch used in the 2022 assessment (16,014 t). The 2023 realized catch as of September 27, 2023 was used in projections. The projected catch in 2024-2025 was estimated as the average over the past decade of final catches and was updated to 34,985 t from 40,739 t (used in the 2022 projections).

For the 2024 fishery, the maximum ABC (maxABC) is 189,360 t from the updated projection model based on Model 18.3 (McGilliard et al. 2022). This maxABC is higher than last year's maxABC of 158,935 t and slightly more than last year's projected 2024 maxABC of 187,631 t. The 2022 BSAI Northern rock sole assessment (McGilliard et al. 2022) reduced the ABC from maxABC due to concerns about diagnostics and retrospective patterns in the assessment. The reduced ABC was set equal to the OFL from an alternative model (Model 22.1; McGilliard et al. 2022) that shows improved diagnostics and retrospective patterns. This year, the 2024 and 2025 projected ABC is reduced in the same manner, by setting it equal to the OFL from the updated alternative projections based on the best model.

The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished (Table 5).

Updated catch data (NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network (AKFIN) database, <http://www.akfin.org>) indicated higher catches in 2023 than in 2021 and 2022, but lower catches in general than in the early to mid-2000s.

Survey biomass for 2023 is higher than in 2022. The ratio of total catch to age 6+ modelled total biomass has decreased in recent years.

Table 5. BSAI Northern rock sole assessment outputs. Source: McGilliard et al., 2023a

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2023	2024	2024	2025
<i>M</i> (natural mortality rate)	0.15 (f),0.17 (m)	0.15 (f),0.17 (m)	0.15 (f),0.17 (m)	0.15 (f),0.17 (m)
Tier	1a	1a	1a	1a
Projected total (age 6+) biomass (t)	941,359	1,111,320	1,121,670	1,501,330
Projected Female spawning biomass (t)	260,887	291,774	296,808	347,811
<i>B₀</i>	447,795	447,795	447,795	447,795
<i>B_{MSY}</i>	155,293	155,293	155,293	155,293
<i>F_{OFL}</i>	0.176	0.176	0.176	0.176
<i>maxF_{ABC}</i>	0.169	0.169	0.169	0.169
<i>F_{ABC}</i>	0.129	0.108	0.129	0.108
OFL (t)	166,034	196,011	197,828	264,789
maxABC (t)	158,935	187,631	189,360	253,455
ABC (t)**	121,719	119,969	122,091	122,535
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2020	2021	2022	2023
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 realized catches of 18,399 t for 2022, realized catches of 23,093 t as of September 27, 2023, and 34,985 t used in place of maximum permissible ABC for 2024-2025. The 2024-2025 catch was estimated as the average over the past decade of final catches.

** The reduced ABC values were set equal to the OFL from the projected alternative model run (Model 22.1), following the methodology used to establish the ABC in the 2022 assessment (McGilliard et al. 2022).

GOA Northern and Southern rock sole

GOA northern and southern rock sole (*Lepidopsetta ployxystra* and *Lepidopsetta bilineata*) are assessed every 4-years following the stock prioritization schedule. GOA northern rock and southern rock sole are classified as Tier 3 stocks and are assessed using a statistical catch-at-age models that account for regional differences in growth configured in Stock Synthesis 3 (Methot and Wetzel 2013). The western GOA and central-eastern GOA are modeled separately with estimated area-specific growth patterns. The assessment model is not run during an off-cycle year as in 2023. During off-cycle years, harvest projections are presented with recommendations of harvest levels for the next two years, using updated catch information in the projection model (Bryan, 2023b). The last full assessment was carried out by Bryan and Palsson (2021) in 2021.

An assumption of the northern and southern rock sole assessment models is that total rock sole catch is split evenly between the species. New catch data were added to the projection model and the values reported here are representative of the 50% split between species.

New data added to the projection model included an updated 2022 catch of 509 t and 12 t for the central and western GOA, respectively. The 2023 preliminary catch estimates were also used for the 2024 and 2025 catch values in the projection model.

The recommended ABCs for northern rock sole in the central-eastern GOA for 2024 and 2025 are 4,466 t and 4,631 t. The recommended OFLs are 5,227 t and 5,419 t for 2024 and 2025 in the central-eastern GOA. The recommended ABCs for northern rock sole in the western GOA for 2024 and 2025 are 8,916 t and 9,168 t. The recommended OFLs are 10,749 t and 11,047 t. The 2024 advice from the updated projection models is similar to what was recommended in the 2022 assessment for 2024.

The recommended ABCs for southern rock sole in the central-eastern GOA for 2024 and 2025 are 15,024 t and 15,482 t. The recommended OFLs are 17,786 t and 18,321 t. The recommended ABCs for southern rock sole in the western GOA for 2024 and 2025 are 12,430 t and 12,162 t. The recommended OFLs are 14,718 t and 14,926 t. The 2024 advice from the updated projection models is similar to what was recommended in the 2022 assessment for

2024. The stocks are not being subject to overfishing, are not currently overfished, nor are approaching a condition of being overfished (Table 6).

Northern rock sole biomass declined in both the central-eastern and western GOA in 2023 as compared to Southern rock sole biomass was stable in the central-eastern GOA and declined in the western GOA in 2023 as compared to 2021. Exploitation has been generally declining in the central-eastern GOA and consistent levels in the western GOA for both species.

Table 6. GOA Northern and Southern rock sole assessment outputs. Source: Bryan, 2023b

Northern rock sole, Central-Eastern GOA Quantity	As estimated or recommended last year for:		As estimated or recommended this year for:		Northern rock sole, Western GOA Quantity	As estimated or recommended last year for:		As estimated or recommended this year for:	
	2023	2024	2024	2025		2023	2024	2024	2025
<i>M</i> (natural mortality rate; female, male)	0.2, 0.232*	0.2, 0.232*	0.2, 0.232*	0.2, 0.232*	<i>M</i> (natural mortality rate; female, male)	0.2, 0.254*	0.2, 0.254*	0.2, 0.254*	0.2, 0.254*
Tier	3a	3a	3a	3a	Tier	3a	3a	3a	3a
Projected total (age 0+) biomass (t)	37,080	38,502	38,855	40,172	Projected total (age 0+) biomass (t)	66,512	67,083	67,086	67,327
Projected Female spawning biomass (t)	13,431	15,845	16,054	17,427	Projected Female spawning biomass (t)	26,525	29,301	29,303	30,348
<i>B</i> _{100%}	20,913	20,913	20,913	20,913	<i>B</i> _{100%}	28,702	28,702	28,702	28,702
<i>B</i> _{60%}	8,365	8,365	8,365	8,365	<i>B</i> _{60%}	11,481	11,481	11,481	11,481
<i>B</i> _{35%}	7,320	7,320	7,320	7,320	<i>B</i> _{35%}	10,045	10,045	10,045	10,045
<i>F</i> _{OFL}	0.181	0.181	0.181	0.181	<i>F</i> _{OFL}	0.385	0.385	0.385	0.385
<i>maxF</i> _{ABC}	0.153	0.153	0.153	0.153	<i>maxF</i> _{ABC}	0.313	0.313	0.313	0.313
<i>F</i> _{ABC}	0.153	0.153	0.153	0.153	<i>F</i> _{ABC}	0.313	0.313	0.313	0.313
OFL (t)	4,934	5,175	5,227	5,419	OFL (t)	10,259	10,749	10,749	11,047
maxABC (t)	4,214	4,421	4,466	4,631	maxABC (t)	8,508	8,916	8,916	9,168
ABC (t)	4,214	4,421	4,466	4,631	ABC (t)	8,508	8,916	8,916	9,168
Status	As determined last year for:		As determined this year for:		Status	As determined last year for:		As determined this year for:	
Overfishing	No	n/a	No	n/a	Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No	Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No	Approaching overfished	n/a	No	n/a	No

*Female natural mortality is fixed and male natural mortality is estimated in the assessment model.
Northern rock sole, central-eastern GOA: Projections are based on the final catch of 509 t for 2022 and preliminary catch of 223 t used in place of maximum permissible ABC for 2023, 2024, and 2025.

*Female natural mortality is fixed and male natural mortality is estimated in the assessment model.
Northern rock sole, western GOA: Projections are based on a final catch of 12 t for 2022 and preliminary catch of 10 t used in place of maximum permissible ABC for 2023, 2024, and 2025.

Southern rock sole, Central-Eastern GOA Quantity	As estimated or recommended last year for:		As estimated or recommended this year for:		Southern rock sole, Western GOA Quantity	As estimated or recommended last year for:		As estimated or recommended this year for:	
	2023	2024	2024	2025		2022	2023	2023	2024
<i>M</i> (natural mortality rate; female, male)	0.2, 0.253*	0.2, 0.253*	0.2, 0.253*	0.2, 0.253*	<i>M</i> (natural mortality rate; female, male)	0.2, 0.271*	0.2, 0.271*	0.2, 0.271*	0.2, 0.271*
Tier	3a	3a	3a	3a	Tier	3a	3a	3a	3a
Projected total (age 0+) biomass (t)	133,391	134,647	134,978	135,672	Projected total (age 0+) biomass (t)	114,420	114,480	114,483	113,960
Projected Female spawning biomass (t)	43,539	49,696	49,889	54,623	Projected Female spawning biomass (t)	40,457	45,479	45,481	49,057
<i>B</i> _{100%}	53,439	53,439	53,439	53,439	<i>B</i> _{100%}	43,788	43,788	43,788	43,788
<i>B</i> _{60%}	21,376	21,376	21,376	21,376	<i>B</i> _{60%}	17,515	17,515	17,515	17,515
<i>B</i> _{35%}	18,703	18,703	18,703	18,703	<i>B</i> _{35%}	15,326	15,326	15,326	15,326
<i>F</i> _{OFL}	0.268	0.268	0.268	0.268	<i>F</i> _{OFL}	0.222	0.222	0.222	0.222
<i>maxF</i> _{ABC}	0.224	0.224	0.224	0.224	<i>maxF</i> _{ABC}	0.185	0.185	0.185	0.185
<i>F</i> _{ABC}	0.224	0.224	0.224	0.224	<i>F</i> _{ABC}	0.185	0.185	0.185	0.185
OFL (t)	16,874	17,733	17,787	18,322	OFL (t)	14,029	14,718	14,718	14,926
maxABC (t)	14,246	14,978	15,024	15,483	maxABC (t)	11,840	12,430	12,430	12,612
ABC (t)	14,246	14,978	15,024	15,482	ABC (t)	11,840	12,430	12,430	12,612
Status	As determined last year for:		As determined this year for:		Status	As determined last year for:		As determined this year for:	
Overfishing	No	n/a	No	n/a	Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No	Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No	Approaching overfished	n/a	No	n/a	No

*Female natural mortality is fixed and male natural mortality is estimated in the assessment model.
Southern rock sole, central-eastern GOA: Projections are based on the final catch of 509 t for 2022 and preliminary catch of 223 t used in place of maximum permissible ABC for 2023, 2024, and 2025.

*Female natural mortality is fixed and male natural mortality is estimated in the assessment model.
Southern rock sole, western GOA: Projections are based on a final catch of 12 t for 2022 and preliminary catch of 10 t used in place of maximum permissible ABC for 2023, 2024, and 2025.

BSAI Alaska plaice

Alaska plaice (*Pleuronectes quadrituberculatus*) are assessed on a four year cycle in which a full assessment is conducted every four years and a harvest projection is done on the off years. A harvest projection involves projecting the model, established in the last full assessment, forward to predict future population estimates and recommended harvest levels for the next two years. The primary assessment tool for the BSAI Alaska plaice assessment, a Tier 3 stock, is a statistical age-structured model that uses survey and fishery data to generate a historical time series of population estimates. The data sets used in 2023 assessment include total catch biomass, fishery age compositions, EBS shelf bottom trawl survey abundance estimates, and EBS shelf bottom trawl survey age compositions. For the 2023 Alaska plaice stock assessment, a harvest projection was conducted by Cronin-Fine (2023).

In a harvest projection year, the full assessment model is not rerun but instead a Tier 3 projection model with updated catch estimates is run to estimate the stock level in future years. This incorporates the most current harvest information without re-estimating model parameters and biological reference points. The Tier 3 projection operates outside the full assessment model by projecting estimates of future female spawning biomass, age 3+ total biomass, ABC and OFL from the full model estimates of 2021 numbers-at-age, weight-at-age, maturity, and selectivity. Please refer to the last full stock assessment report for further information regarding the stock assessment model (Ormseth, 2021).

New data added to the Tier 3 projection model included an updated 2022 catch estimate (11,253 t) and a new catch estimate for 2023 through September 16, 2023 (sourced October 16, 2023 from the NMFS Alaska Regional Office using the Alaska Fisheries Information Network [AKFIN] database). Following the method used in the 2021 full assessment, the full-year 2023 catch (18,054 t) was estimated by averaging the three weeks of catch prior to September 16 and using this value as the assumed weekly catch for the remaining 15 weeks in 2023.

There were no changes in assessment methodology since this was a harvest projection.

For 2024, the recommended maximum allowable ABC from the Tier 3 projection model is 35,494 t. Reference values for BSAI Alaska plaice are summarized in Table 7, with the recommended ABC and OFL values for 2024 in bold. The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished. The tests for evaluating these three statements on status determination require examining the official total catch from the most recent complete year (2022) and the current model projections of spawning biomass relative to BMSY for 2024 and 2025. The estimated total catch for 2022 is 11,253 t, far below the 2022 OFL of 39,305 t; therefore, the stock is not being subjected to overfishing. The estimates of female spawning biomass for 2024 and 2025 from the 2023 stock assessment projections are 158,087 t and 166,827 t, respectively. Both estimates are well above the estimate of B35% of 100,306 t and therefore the stock is not currently overfished nor approaching an overfished condition.

Table 7. BSAI Alaska plaice assessment outputs. Source: Cronin-Fine, 2023

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2023	2024	2024	2025
<i>M</i> (natural mortality rate)	0.13	0.13	0.13	0.13
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	461,992	477,701	473,125	481,959
Female spawning biomass (t)	149,987	158,149	158,087	166,827
<i>B</i> _{100%}	286,587	286,587	286,587	286,587
<i>B</i> _{40%}	114,635	114,635	114,635	114,635
<i>B</i> _{35%}	100,306	100,306	100,306	100,306
<i>F</i> _{OFL}	0.17	0.17	0.17	0.17
<i>maxF</i> _{ABC}	0.14	0.14	0.17	0.17
<i>F</i> _{ABC}	0.14	0.14	0.14	0.14
OFL (t)	40,823	43,328	42,695	45,182
maxABC (t)	33,946	36,021	35,494	37,560
ABC (t)	33,946	36,021	35,494	37,560
Status	As determined last year for:		As determined this year for:	
	2021	2022	2022	2023
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Alaska plaice are caught throughout the year primarily as bycatch in the yellowfin sole (*Limanda aspera*) fishery. Across all fisheries, retention rates of Alaska plaice are high. It is estimated to be greater than 90% since 2018. The 2023 projected catch for Alaska plaice is 18,054 t, well below the 2023 ABC of 35,494 t. The 2023 exploitation ratio (catch/total biomass) is also projected to decrease and is estimated to be slightly below the 1975-2023 long-term average of ~ 0.03. If the 2023 projected catch is realized, it will be the lowest catch to biomass ratio for Alaska plaice since 2009.

The 2023 EBS shelf trawl survey biomass estimate for Alaska plaice decreased by 5% from the 2022 estimate however the 95% confidence intervals for the two biomass estimates closely overlap. This year's survey biomass

estimate is also 30% lower than the long-term mean. Because this is a harvest projection, the 2023 survey biomass estimate was not included when determining the recommended harvest levels for 2023 but will be added in the next full assessment model. Interested readers may note the increasing trend in the projected population biomass, despite decreasing survey biomass estimates between 2017 and 2023. This result is attributed to strong recruitment events since 2017, which began to emerge in the 2019 assessment (Ormseth 2021).

GOA Flathead sole

The GOA flathead sole stock is typically assessed every four years and was last assessed in 2022 (Kapur and Monnohan, 2022). In years without a full assessment harvest projections to recommend harvest levels for the next two years are presented (Kapur, 2023a).

Flathead sole is assessed using an age-structured model and Tier 3 determination. Thus, the single species projection model was run using parameter values from the accepted 2022 flathead sole assessment model, together with updated catch information for 2022, and estimated catches for 2022-2025 to predict stock status for flathead sole and to make ABC recommendations for those years. Projections are conducted using numbers-at-age for flathead sole from age 3-21+ and historical recruitment of age 3 individuals is used to calculate OFLs and ABCs.

The updated information for this harvest projection includes replacing the estimated 2022 catch with the final catch value from the Alaska Regional Office (https://www.fisheries.noaa.gov/sites/default/files/akro/car110_goa2020.html) (564 t), and estimating the 2023-2025 catches. The 2023 projected catch was calculated as the current catch as of 2023-09-28 added to the average 28 September – December 31 catches over the previous 5 years. The 2024 and 2025 projected catches were calculated as the average catch over the previous 5 years (1,611 t). These estimated catches for the present and two future years are input in place of maxABC for projections, which is appropriate given that recent catches are much less than the maximum ABC for this stock.

The ABC for flathead sole is 40,503 t in 2024 and 41,258 t in 2025 and the OFL is 49,414 t in 2024 and 50,322 t in 2025. The new ABC recommendation and OFL values are similar to those developed in 2022 for 2024 (40,222 t and 49,073 t, respectively). The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished (Table 8).

Table 8. GOA flathead sole assessment outputs. Source: Kapur, 2023a

Quantity/Status	As estimated or specified last year for:		As estimated or recommended this year for:	
	2023	2024	2024*	2025*
M	0.2	0.2	0.2	0.2
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	294,188	293,277	294,616	292,639
Projected Female spawning biomass (t)	94,059	95,932	96,604	98,468
B _{100%}	92,582	92,582	92,582	92,582
B _{40%}	37,033	37,033	37,033	37,033
B _{35%}	32,404	32,404	32,404	32,404
F _{OFL}	0.36	0.36	0.36	0.36
maxF _{ABC}	0.29	0.29	0.29	0.29
F _{ABC}	0.29	0.29	0.29	0.29
OFL (t)	48,161	49,073	49,414	50,322
maxABC (t)	39,480	40,222	40,503	41,258
ABC (t)	39,480	40,222	40,503	41,258
Status	As determined last year for:		As determined this year for:	
	2022	2023	2023	2024
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 598 t for 2023 and estimates of 1,611 t and 1,611 t used in place of maximum permissible ABC for 2024 and 2025.

BSAI Flathead sole

Flathead sole (a two-species complex consisting of true Flathead sole (*Hippoglossoides elassodon*) and its morphologically-similar congener Bering flounder (*Hippoglossoides* spp.) is currently assessed on a four-year cycle; the most recent full assessment was conducted in 2020 (Monnahan and Haehn, 2020) and will be updated in 2024. In years without a full assessment, harvest levels for the next two years is presented (Kapur, 2023b)

Flathead sole is assessed using an age-structured model and Tier 3 determination. The projection model is run using parameter values from the accepted 2020 assessment model, together with updated catch information for 2020-2022, estimated catches for 2023 and projected catches 2024-2025, to predict stock status for flathead sole in 2024-2025, and to make ABC recommendations and set OFL for those years.

To run the projection model to predict ABCs for 2024 and 2025, observed catches for 2020-2022 and estimates for the total catches in 2023-2025 were used. The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished (Table 9).

The most recent fishery data of flathead sole and Bering flounder combined and Flathead sole only, and Bering flounder only are available in Kapur (2023b). Observer data of species-specific extrapolated weight in each haul was summed over hauls within each year and used to calculate the proportion of the total *Hippoglossoides* spp. catch that was flathead sole or Bering flounder. Proportions were multiplied by the total *Hippoglossoides* spp. (flathead sole and Bering flounder combined) catches reported by AKFIN to obtain total catch of flathead sole separately from that of Bering flounder. The catch to total (3+) biomass ratio has declined since 2007.

An Aleutian Islands survey was conducted in 2022, and the 2022 total BSAI estimate was 710,804 t, a roughly 6% increase over the 2021 regression estimate of 670,091 t. None of the interpolated or observed values from 2020 onwards are included in the base assessment model, nor the projection.

Table 9. BSAI flathead sole assessment outputs. Source: Kapur, 2023b

Quantity/Status	As estimated or specified <i>last</i> year for:		As estimated or recommended <i>this</i> year for:	
	2023	2024	2024*	2025*
M	0.2	0.2	0.2	0.2
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	606,522	606,080	609,488	608,230
Projected Female spawning biomass (t)	158,962	164,594	165,629	169,452
<i>max</i> F _{ABC}	0.37	0.37	0.37	0.37
F _{ABC}	0.37	0.37	0.37	0.37
OFL (t)	79,256	81,167	81,605	82,699
<i>max</i> ABC (t)	65,344	66,927	67,289	68,203
ABC (t)	65,344	66,927	67,289	68,203
Status	As determined <i>last</i> year for:		As determined <i>this</i> year for:	
	2022	2023	2023	2024
Overfishing	No	n/a	No	n/a

*Projections are based on an estimated catch of 8,811 t for 2023 and estimates of 12,246 t and 12,246 t used in place of maximum permissible ABC for 2024 and 2025.

GOA Rex sole

The GOA rex sole stock is assessed every four years and was last assessed in 2021. In between the full assessment years, harvest levels for the next two years are presented in McGilliard (2023b). The 2021 full stock assessment report was carried by McGilliard and Palsson (2021).

Rex sole is assessed using an age-structured model and Tier 3 determination within the context of a two-area model. The Western-Central GOA and Eastern GOA are modeled as separate areas with distinct growth patterns estimated by area. Thus, the single species projection model was run separately for the two areas using parameter values from the accepted 2021 rex sole assessment model (McGilliard and Palsson 2021), together with updated catch information for 2021-2023, to predict stock status for rex sole in 2024 and 2025 and to make ABC recommendations for those years. Projections are conducted using numbers-at-age for rex sole from age 3-20+ by area and historical recruitment of age 3 individuals by area to calculate OFL's and ABC's.

New data added to the projection model included updated final catch data from 2021-2022 from the Western and Central GOA of 299 t and 695 t, and realized catch as of September 27, 2023 of 375 t. Catches from the Eastern GOA area often confidential with a long-term average of less than 2 t. New estimated catches for 2024-2025 was calculated as the average catch over the previous five years. The average catch was 1,118 t for Western and Central GOA and 2 t for Eastern GOA.

Based on the updated projection model results, the recommended ABC's for 2024 and 2025 in the Western-Central GOA are 17,006 t and 16,987 t, and the OFL's are 20,660 t and 20,635 t. The new ABC recommendation and OFL for the Western-Central GOA in 2024 are similar to those projected for 2024 developed in 2022 (16,739 t and 20,335 t). The recommended ABC's for 2024 and 2025 in the Eastern GOA are 4,358 t and 4,316 t, and the OFL's are 5,318 t and 5,265 t. The new ABC recommendation and OFL for the Eastern GOA in 2023 are almost exactly the same as those developed in 2022 because realized and projected catches as estimated last year and this year were approximately within 1 t of each other. The principal reference values are shown in Table 10. The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished.

Updated catch data (NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network (AKFIN) database, <http://www.akfin.org>) indicate lower catches in 2023 than in 2022, with lower than average catches for 2021-2023.

The survey biomass is lower than in 2021. The ratio of total catch to age 3+ modelled total biomass has been stable over the past three years, around a value of 0.01. The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished.

Table 10. GOA rex sole assessment outputs. Source: McGilliard, 2023b

Quantity	As estimated or specified this year for:		As estimated or recommended this year for:	
	2023	2024	2024	2025
<i>M</i> (natural mortality rate)	0.17	0.17	0.17	0.17
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	127,297	128,207	129,611	129,296
Female spawning biomass (t)	56,965	59,734	60,486	61,413
<i>B</i> _{100%}	See area-specific tables below		See area-specific tables below	
<i>B</i> _{40%}				
<i>B</i> _{33%}				
<i>F</i> _{OFL}				
<i>maxF</i> _{ABC}				
<i>F</i> _{ABC}				
OFL (t)	25,135	25,652	25,978	25,900
maxABC (t)	20,664	21,097	21,364	21,303
ABC (t)	20,664	21,097	21,364	21,303
Status	As determined last year for:		As determined this year for:	
	2021	2022	2022	2023
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

BSAI Greenland turbot

BSAI Greenland turbot are assessed biennially according to the stock assessment prioritization schedule. A statistical catch-at-age model configured in Stock Synthesis 3 (Methot and Wetzel, 2013) is used as the primary assessment tool for BSAI Greenland turbot, which qualifies as a Tier 3 stock. The assessment model is not run during an off-cycle year. During odd years, a harvest projection is presented with recommendations of harvest levels for the next two years for this species, using updated catch information in the projection model (Bryan, 2023c). The last full assessment stock assessment conducted in 2022 (Bryan et al., 2022; is available online https://apps-afsc.fisheries.noaa.gov/Plan_Team/2022/BSAIrturbot.pdf). A full stock assessment document with updated assessment and projection model results will be presented in November, 2024.

The specified ratios of fishing mortality for the trawl and fixed gear fleets were updated to 0.86 and 0.14, respectively, in the projection model. This was based on a five year average (2018-2022). In previous assessment years the ratio had been closer to 0.5, but since fishing mortality of the trawl fleet has increased and this fleet encounters smaller Greenland turbot, the updated average ratio better reflects the current relative split between the two fleets. New data added to the projection model included an updated 2022 catch estimate of 1,478 t, and new catch estimates for 2023-2025. The estimated 2023 catch is the average proportion of the TAC harvested over the previous 5 years (2018-2022) applied to the 2023 TAC. This resulted in an estimated catch for 2023 of 1,437 t. The 2023 estimated catch was used for the 2024 and 2025 catch values in the projection model.

Based on the projection model results, recommended ABCs for 2024 and 2025 are 3,188 t and 2,740 t. The recommended OFLs are 3,705 t and 3,185 t for 2024 and 2025, respectively. The new ABC and OFL recommendations for 2024 are 20% lower than the 2023 ABCs and OFL developed using the 2022 full assessment model, and 6% lower than the 2024 ABC and OFL specified last year.

Greenland turbot biomass in the EBS shelf bottom trawl survey has been steadily declining since 2015. The EBS shelf bottom trawl survey biomass declined by 25% in 2023 and is at the lowest levels since 1977. Exploitation rates have been generally increasing since 2015 as total biomass declines. The stock is not overfished, and is not approaching a condition of being overfished. The results are presented in Table 11.

Table 11. BSAI Greenland turbot assessment outputs. Source: Bryan, 2023.

Quantity	As estimated or specified last year for:		As estimated or recommended this year* for:	
	2023	2024	2024	2025
<i>M</i> (natural mortality rate)	0.112	0.112	0.112	0.112
Tier	3a	3a	3a	3a
Projected total (age 1+)	53,907	48,850	50,278	47,854
Female spawning biomass	33,554	30,484	31,653	29,439
Projected				
<i>B</i> _{100%}	67,647	67,647	67,647	67,647
<i>B</i> _{40%}	27,058	27,058	27,058	27,058
<i>B</i> _{35%}	23,676	23,676	23,676	23,676
<i>F</i> _{OFL}	0.2	0.2	0.18	0.18
<i>maxF</i> _{ABC}	0.17	0.17	0.15	0.15
<i>F</i> _{ABC}	0.17	0.17	0.15	0.15
OFL (t)	4,645	3,947	3,705	3,185
maxABC (t)	3,960	3,364	3,188	2,740
ABC (t)	3,960	3,364	3,188	2,740
	As determined last year for:		As determined this year for:	
Status	2021	2022	2022	2023
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 model 16.4c. The assumed fishing mortality ratios for the trawl and fixed gear fleets were updated to 86% and 14%, respectively. Catch in 2022 was updated to 1,478 t and preliminary estimated catches for 2023 – 2025 were set to 1,437 t in place of the maximum ABC. The preliminary catch estimates represent the average proportion of the TAC captured over the previous 5 years (2018-2022) and the 2023 TAC.

4.5 Management strategy

The Council recommends harvest specifications, overfishing limits (OFLs), Acceptable Biological Catch (ABC) levels and total allowable catch (TAC) annually based on the Stock Assessment and Fishery Evaluation (SAFE) reports, consistent with the Science and Statistical Committee (SSC) recommendations. Additionally, the tier approach assigns groundfish stock to a tier according to available data and uncertainty associated with the fishery. The tier system harvest control rules (HCRs) specify the maximum permissible ABC, and the OFL for each stock. As specified in the MSA, if stocks decline below the Minimum Stock Size Threshold (MSST), a rebuilding plan must be implemented to bring the biomass back to the BMSY level (biomass relative to maximum sustainable yield [MSY]) within a specified timeframe.

4.6 Ecological impacts

The catch composition for landed and discarded associated species for the past five years was reviewed for both the BSAI and GOA (tables below), with target species in this fishery given in green, and minor associated species are given in white (there are no main associated species), and species in the bottom 5% which need no further consideration in grey. There have been no notable trends in any of this data over the past five years that would indicate fishery changes in need of further investigation.

Table 12. Catch composition of main and minor species (and some habitat-forming species) in the BSAI flatfish fishery. Weights are given in tons.

Species	2018	2019	2020	2021	2022	5-year total	% of total
Yellowfin sole	127,119	126,729	131,666	106,284	152,543	644,341	49.79%
Pollock	36,612	34,119	40,904	31,840	36,127	179,602	13.88%

Species	2018	2019	2020	2021	2022	5-year total	% of total
Rock sole	24,503	23,537	24,412	12,923	16,889	102,264	7.90%
P. cod	19,464	19,186	17,726	11,518	14,217	82,111	6.34%
AK plaice	20,233	15,693	19,471	13,864	11,106	80,366	6.21%
Flathead sole	9,330	13,901	6,710	8,262	12,984	51,186	3.96%
Arrow fldr	5,474	8,445	8,896	7,367	6,109	36,291	2.80%
Kamchatka fldr	2,168	3,444	6,301	5,735	7,520	25,167	1.94%
Alaska skate	3,288	4,632	3,169	4,313	4,080	19,482	1.51%
Starry fldr	5,261	2,365	2,438	1,220	921	12,205	0.94%
Turbot	1,595	2,574	1,920	1,367	1,219	8,674	0.67%
Bivalves	1,792	2,261	2,147	2,030	1	8,232	0.64%
Sablefish	196	1,148	1,297	1,340	1,902	5,884	0.45%
Pacific ocean perch (POP)	325	613	1,575	1,550	1,347	5,410	0.42%
Brittle star unidentified		1,189	1,672	1,922	6	4,788	0.37%
Plain sculpin	963	1,033	808			2,804	0.22%
Benthic urochordata				2,378	253	2,631	0.20%
Great sculpin	731	1,068	679			2,478	0.19%
Rex sole	123	538	543	600	489	2,293	0.18%
Capelin	274	871	398	696		2,238	0.17%
Sculpin	0	1	1	1	1,987	1,989	0.15%
Sea star			0		1,635	1,635	0.13%
Giant Grenadier	6	10	18	9	1,375	1,417	0.11%
Thornyhead rf	65	438	158	203	312	1,176	0.09%
Yellow Irish lord	262	275	319			857	0.07%
Corals Bryozoans - Corals Bryozoans Unidentified	231	232	129	191	4	787	0.06%
Aleutian skate	38	211	149	166	108	672	0.05%
Atka mackerel	196	89	84	107	172	647	0.05%
Butter sole	27	44	213	48	238	570	0.04%
Eelpouts		137	171	210	40	558	0.04%
Wht bltchd skate	47	59	148	126	167	548	0.04%
Shorotraker rf	60	95	66	194	77	492	0.04%
Grenadier - Rattail Grenadier Unidentified	31	48	53	85	275	491	0.04%
Skate	77	165	86	70	73	471	0.04%
Bigmouth Sculpin	122	180	120			421	0.03%

Table 13. Primary and secondary species catches in the Gulf of Alaska flatfish trawl fishery from 2018-2022. Weights are given in tons.

Species	2018	2019	2020	2021	2022	Total last 5	Percent of total
Arrow fldr	15,209	20,632	16,615	5,953	7,416	65,824	60.9%
Flathead sole	1,834	2,058	1,318	440	408	6,058	5.6%
POP	907	1,696	956	697	843	5,099	4.7%
Pollock	2,146	1,519	579	385	251	4,879	4.5%
Unidentified rockfish	1,303	1,457	1,237	376		4,373	4.0%
Rock sole	1,816	447	268	1,062	725	4,318	4.0%
Rex sole	1,459	935	710	147	536	3,787	3.5%
Sablefish	1,365	959	494	327	478	3,623	3.4%

Species	2018	2019	2020	2021	2022	Total last 5	Percent of total
Big skate	534	593	498	31	39	1,695	1.6%
Butter sole	365	80	96	288	127	956	0.9%
Longnose skate	297	292	176	38	15	817	0.8%
Dusky rf	153	291	105	215	45	809	0.7%
English sole	107	197	304	124	70	802	0.7%
Northern rf	136	420	66	67	82	771	0.7%
Atka mackerel	182	266		258	12	718	0.7%
Spiny dogfish	83	308	35	16	7	449	0.4%
Misc fish	120.60		151.78	40.71	41.34	354	0.3%
Rougeye rf	132	106	87	22	3	350	0.3%
Sculpin				146.94	142.80	290	0.3%
Sleeper shark	193	16	18	30	18	274	0.3%
Dover sole	61	23	48	31	65	228	0.2%
Aleutian skate	88	77	29	14	15	223	0.2%
Thornyhead rf	55	77	37	24		194	0.2%
Yellow Irish lord	87	92	3		3	185	0.2%
Starry fldr	86	26	10		40	163	0.2%
Skate	44	52	16	7	9	128	0.1%
Sea star	45.05	26.93	10.05	12.25	12.23	107	0.1%
Octopus	21	32	32			85	0.1%
Giant Grenadier			80.07	1.34	1.34	83	0.1%
Squid		4.66	44.97	4.96	4.97	60	0.1%
Shorthead rf	13	21	13		10	57	0.1%

Catches of Prohibited Species (PSC; species that must be discarded if caught) were also reviewed for both the BSAI and GOA fisheries. Decreased bycatch of PSC crabs and salmon in the BSAI reflects the decreasing stock abundances of these species groups. These declines prompted a complete closure of the Red King Crab and snow crab fisheries in the Bering Sea, as well as disaster relief responses in coastal western Alaska, where chinook and other salmon runs have been experiencing unprecedented declines (NOAA Fisheries 2022).

Table 14. Catches of crab and salmon species in the BSAI flatfish trawl fishery from 2018-2022. Units are numbers of individuals.

Crab or Salmon spp (Numbers)	2018	2019	2020	2021	2022
Opilio Tanner Crab	1,557,384	886,539	733,328	226,687	201,881
Bairdi Tanner Crab	176,368	334,336	581,269	563,319	429,762
Red King Crab	28,579	68,263	63,476	40,000	8,290
Golden King Crab	2,271	12,210	7,395	9,167	7,049
non-Chinook	10,756	4,762	845	1,851	581
Chinook	1,205	3,401	1,546	1,851	258
Blue King Crab	389	629	115	361	453

Table 15. Catches of crab and salmon species in the GOA flatfish trawl fishery from 2018-2022. Units are numbers of individuals.

Crab or Salmon spp (Numbers)	2017	2018	2019	2020	2021	2022
Bairdi Tanner Crab	119,874	233,699	203,204	601,043	9,439	5,226
Chinook	736	1,528	2,313	231	1,005	206
non-Chinook	466	627	968	438	779	205
Golden King Crab	1	4	132	0	1	

Opilio Tanner Crab					131	
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ETP species

The ESA (United States 1983), signed on 1973, provides for the conservation of species that are endangered or threatened and the conservation of the ecosystems on which they depend. NOAA has jurisdiction over endangered and threatened marine species and works with the U.S. Fish and Wildlife Service (USFWS) to manage ESA-listed species. Generally, NOAA manages marine species, while USFWS manages land and freshwater species.

Section 4(f) ESA directs NOAA's NMFS to develop and implement recovery plans for threatened and endangered species. NMFS OLE works with the USCG and other partners to enforce and prosecute ESA violations.

Recovery plans for ESA-listed species must include: (1) a description of site-specific management actions necessary to conserve the species or populations; (2) objective, measurable criteria which, when met, will allow the species or populations to be removed from the endangered and threatened species list; and (3) estimates of the time and funding required to achieve the plan's goals. Each ESA-listed species has a recovery plan, and regular updates on progress toward recovery.

When a species is listed as endangered it is illegal to "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. However, Section 10 of the ESA allows NOAA Fisheries Service to issue permits for incidental take (Incidental Take Statements; ITS), with the requirement of a conservation plan to minimize and mitigate impacts to the affected species.

Section 7(a)(2) of the ESA requires that each federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. When the action of a federal agency may affect species listed as threatened or endangered, that agency is required to consult with either NOAA's NMFS or the USFWS, depending upon the species that may be affected. In instances where NMFS or USFWS are themselves proposing an action that may affect listed species, the agency must conduct intra-service consultation.

The product of a formal consultation is a biological opinion (BiOp) that determines if the action is likely to jeopardize the continued existence of any ESA-listed species or result in the destruction or adverse modification of critical habitat. If an opinion determines that the proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat, it must include a "reasonable and prudent alternative (RPA)" that avoids the likelihood of jeopardy or adverse modification or otherwise indicate that to the best of the agency's knowledge, there are no RPAs. If the analysis concludes with a determination that the proposed action is not likely to jeopardize a listed species or destroy or adversely affect critical habitat and incidental take of listed species is reasonably certain to occur, then the biological opinion includes an incidental take statement (ITS) with the anticipated level of take of the listed species and "reasonable and prudent measures (RPM)" to avoid and minimize the take.

Marine Mammals

Annually, NMFS classifies commercial fisheries on the List of Fisheries based on the level of marine mammal mortality (deaths) and serious injury that they cause incidentally (i.e., accidentally or unintentionally). In classifying fisheries, NMFS compares the numbers of marine mammals that are incidentally killed or seriously injured by commercial fishing operations to a stock's potential biological removal (PBR) level. To prepare the MMPA List of Fisheries, NMFS primarily uses marine mammal stock assessment reports, which generally summarize data from a rolling five-year period, and supplements these data with other sources, as needed. Commercial fisheries with frequent incidental deaths and serious injuries (that are by themselves responsible for the NMFS Marine Mammal Authorization Program, annual removal of 50 percent or more of any marine mammal stock's PBR) are classified as Category I. Fisheries with occasional deaths and serious injuries (greater than 1 percent and less than 50 percent annual removal of a stock's PBR) are classified as Category II. Fisheries with a remote likelihood or no known deaths or serious injuries (less than or equal to one percent of a stock's PBR) are classified as Category III. Category I and II fisheries may be required by NMFS to implement actions to reduce incidental mortality and serious injury. The Alaska BSAI flatfish trawl fishery is a category II fishery on the MMPA list of fisheries (see below table). The basis for this classification is the total annual mortality and serious injury of Steller sea lions (Western US stock) and killer whales (AK resident stock) is more than 1% and less than 50% of each stock's PBR level. According to Freed et. Al. (2023), Table 13 shows the total number of serious injuries and mortalities to marine mammals between 2017 and 2021 in both the GOA and BSAI fisheries.

Table 16. Total Serious Injury/Mortality of marine mammals in the BSAI and GOA flatfish trawl fisheries from 2017-2021

	Year					
Species	2017	2018	2019	2020	2021	Grand Total
Bearded Seal	1	1				2
Harbor Seal	7	1	2	2	1	13
Killer Whale		1		2	3	6
Northern Fur Seal	1	2	12			15
Ringed Seal	8	14	2	1	4	29
Spotted Seal	2		1	2	2	7
Steller Sea Lion	13	9	15	14	18	69
Unidentified Otariid			1			1
Unidentified Pinniped				1		1
Unidentified Whale	1					1
Grand Total	33	28	33	22	28	144

Current Classification on the List of Fisheries

Category	II
Estimated Number of Participants	29
Target Species	flatfish
Applicable Take Reduction Plans	N/A
Observer Coverage	From 1998-2005, pooled observer coverage for all areas was: 59.4%, 66.3%, 64.5%, 57.6%, 58.4%, 63.9%, 68.2%, and 68.3%, respectively.
Marine Mammal Species/ Stocks Killed or Injured	Bearded seal, Beringia; Gray whale, Eastern North Pacific; Harbor porpoise, Bering Sea; Harbor seal, Bristol Bay; Humpback whale, Western North Pacific; Killer whale, Eastern North Pacific Alaska resident ¹ ; Killer whale, Eastern North Pacific GOA, AI, BS transient ¹ ; Northern fur seals, Eastern Pacific; Ribbon seal; Ringed seal, Arctic; Spotted seal, Bering; Steller sea lion, Western U.S. ¹ ; Walrus, AK.

In addition, there have been up to 10 killer whale takes in the BSAI flatfish trawl fishery in recent years, including incidents from 2023. More information can be found at the following link: <https://www.fisheries.noaa.gov/feature-story/cause-death-determined-11-killer-whales-incidentally-caught-fishing-gear-alaska-2023>. Though this is not a conservation concern for the whale stock, the fishery is actively working on gear modifications to avoid killer whale takes, which are thought to be due to new behaviors by the killer whales in and around the trawl nets.

Bearded seal²

The most recent NOAA stock assessment report for bearded seal is from 2021 (Muto et al 2021). Bearded seals are listed as threatened under the ESA and thus designated depleted under the MMPA and listed as “strategic.” The best

² <https://media.fisheries.noaa.gov/2021-08/BEARDED-SEAL-Erignathus-barbatus-nautilus-Beringia-Stock.pdf>

estimate of total human caused mortality and serious injury in the portion of the stock in US waters is 6,709 which is less than the negatively biased PBR of 8,210. The minimum estimated mean annual rate of US commercial fishery-related mortality and serious injury is 1.8 seals and therefore can be considered insignificant and approaching zero mortality and serious injury rate. The primary threat to this population is a lack of sea ice cover due to climate change. In addition, the majority of mortalities is due to hunting in native Alaska communities, with a statewide total from last count (in 2015) of 6,707 individuals. There are no recorded interactions with any of the fisheries in the present assessment.

Harbor Seal (Alaska stocks)³

The current statewide abundance estimate for Alaska harbor seals is 243,938 (Boveng et al. 2019), based on aerial survey data collected from 1996 to 2018 (Boveng et al. 2019). See Table 1 on page 46 of Muto et. al. 2020 for abundance estimates of the 12 stocks of harbor seals in Alaska.

PBRs for these stocks range from 7 for the small Pribilof Islands stock, to 1,607 for the Bristol Bay stock. The minimum estimated mean annual level of human-caused mortality and serious injury for all harbor seal stocks between 2013 and 2017 is 1,135 harbor seals: 32 in U.S. commercial fisheries, 0.4 in unknown (commercial, recreational, or subsistence) fisheries, 3.7 due to other causes (illegal shooting, entanglement in ADF&G research trawl gear), and 1,099 in the Alaska Native subsistence harvest. Given that takes in Alaska Native subsistence harvest dwarf those from all fishing, and the total annual takes from this fishery are less than even the smallest PBR of 7, we can conclude that this fishery is not adversely affecting any of these stocks.

Killer whale (eastern North Pacific Alaska resident)⁴

The minimum estimated mean annual level of human-caused mortality and serious injury for Alaska Resident killer whales between 2016 and 2020 is 1.3 killer whales: 1.1 in commercial fisheries and 0.2 in unknown (commercial, recreational, or subsistence) fisheries. Potential threats most likely to result in direct human-caused mortality or serious injury of this stock include oil spills, vessel strikes, and interactions with fisheries. Between 2016 and 2020, mortality and serious injury of killer whales occurred in two of the federally-regulated U.S. commercial fisheries that are monitored for incidental mortality and serious injury of marine mammals by fishery observers: the Bering Sea/Aleutian Islands flatfish trawl (two individuals) and Bering Sea/Aleutian Islands Pacific cod longline fisheries (one individual; Table 2; Breiwick 2013; MML, unpubl. data). Resident killer whales are known to depredate longline fisheries for cod and sablefish and increasingly to follow catcher-processor boats such as for flatfish, actively feeding on waste from at-sea processing. This activity accounts for one of the two mortalities in the flatfish trawl fishery due to propeller strike rather than direct capture.

The Eastern North Pacific Alaska Resident stock of killer whales is not designated as depleted under the MMPA or listed as threatened or endangered under the ESA. The minimum abundance estimate for the Alaska Resident stock is likely underestimated because researchers continue to encounter new whales in the GOA and in western Alaska waters. Because the population estimate is likely to be conservative, the PBR is also conservative.

Based on currently available data, a minimum estimate of the mean annual mortality and serious injury rate due to U.S. commercial fisheries (1.1 killer whales) is less than 10% of the PBR (10% of PBR = 1.9) and, therefore, is considered to be insignificant and approaching a zero mortality and serious injury rate. A minimum estimate of the total annual level of human-caused mortality and serious injury (1.3 killer whales) is not known to exceed the PBR (19). Therefore, the Eastern North Pacific Alaska Resident stock of killer whales is not classified as a strategic stock.

Killer Whale (GOA, Aleutian Islands and Bering Sea transient)⁵

The minimum estimated mean annual level of human-caused mortality and serious injury for GOA, Aleutian Islands, and Bering Sea Transient killer whales between 2014 and 2018 is 0.8 killer whales in U.S. commercial fisheries. Potential threats most likely to result in direct human-caused mortality or serious injury of this stock include oil spills, vessel strikes, and interactions with fisheries. Two of the federally-regulated U.S. commercial fisheries, monitored for incidental mortality and serious injury of marine mammals by fishery observers, incurred serious injury and mortality of killer whales of unknown stock between 2014 and 2018: the BSAI flatfish trawl and BSAI Greenland turbot longline fisheries (Table 1; Breiwick 2013; MML, unpubl. data). A minimum estimate of the mean annual mortality and serious injury rate incidental to U.S. commercial fisheries between 2014 and 2018 is 0.8 GOA, Aleutian Islands, and Bering Sea Transient killer whales, based on observer data (0.6) and stranding data (0.2). It is less likely that transient killer whales are involved in fishery interactions due to depredation because transient killer whales are known to be mammal eaters rather than fish eaters.

³ https://media.fisheries.noaa.gov/dam-migration/2019_sars_alaska_harbor_seal.pdf

⁴ <https://www.fisheries.noaa.gov/s3/2023-08/Killer-Whale-AK-Resident-2022.pdf>

⁵ <https://media.fisheries.noaa.gov/2021-08/KILLER-WHALE-Orcinus-orca-Eastern-North-Pacific-Gulf-of-Alaska-Aleutian-Islands-and-Bering-Sea-Transient-Stock.pdf>

The GOA, Aleutian Islands, and Bering Sea Transient stock of killer whales is not designated as depleted under the MMPA or listed as threatened or endangered under the ESA. Based on currently available data, a minimum estimate of the mean annual mortality and serious injury rate due to U.S. commercial fisheries (0.8 whales) is greater than 10% of the PBR (10% of PBR = 0.6) and, therefore, cannot be considered to be insignificant and approaching a zero mortality and serious injury rate. A minimum estimate of the total annual level of human-caused mortality and serious injury (0.8 whales) is less than the PBR (5.9). Therefore, the GOA, Aleutian Islands, and Bering Sea Transient stock of killer whales is not classified as a strategic stock.

Northern Fur Seal, Eastern Pacific⁶

The minimum estimated mean annual level of human-caused mortality and serious injury for the Eastern Pacific stock between 2015 and 2019 is 373 northern fur seals: 3.5 in U.S. commercial fisheries (2.7 from observer data and 0.8 from stranding data), 2.4 in unknown (commercial, recreational, or subsistence) fisheries, 7 in marine debris, 0.4 due to other causes (car strike, dog attack), and 360 in the Alaska Native subsistence harvest. These mortality and serious injury data do not reflect the total potential threat of entanglement, since additional northern fur seals initially considered seriously injured due to entanglement in fishing gear or marine debris were disentangled and released with non-serious injuries between 2015 and 2019 (see details in the text and in Freed et al. 2021). Assignment of mortality and serious injury to both the Eastern Pacific and California stocks of northern fur seals, when events occur in the area and time of year where the two stocks overlap (off the U.S. west coast in December through May), may result in overestimating stock specific mortality and serious injury. Additional potential threats most likely to result in direct human-caused mortality or serious injury of this stock include the increased potential for oil spills due to an increase in vessel traffic in Alaska waters (with changes in sea-ice coverage). Between 2015 and 2019, incidental mortality and serious injury of northern fur seals was observed in one of the federally-managed U.S. commercial fisheries in Alaska monitored for incidental mortality and serious injury by fisheries observers: the BSAI flatfish trawl fishery—the fishery under assessment (Table 2; Breiwick 2013; MML, unpubl. data).

The minimum estimated mean annual mortality and serious injury rate in this fishery between 2015 and 2019 is 2.7 northern fur seals. Based on currently available data, the minimum estimate of the mean annual U.S. commercial fishery-related mortality and serious injury rate for this stock (3.5 northern fur seals) is less than 10% of the calculated PBR (10% of PBR = 1,140 northern fur seals) and, therefore, can be considered insignificant and approaching a zero mortality and serious injury rate. The minimum estimated mean annual level of human-caused mortality and serious injury (373 northern fur seals) does not exceed the PBR (11,403) for this stock. The PBR calculation assumes mortality is evenly distributed across males, females, and each age class; but that is not the case with the subsistence harvest, which accounts for most of the known direct human-caused mortality. The subsistence harvest is almost entirely sub-adult males and male pups and, therefore, has a relatively low impact on the population due to the disproportionate importance of females to the population.

Ringed Seal (Arctic stock)⁷

Between 2014 and 2018, incidental mortality and serious injury of ringed seals in U.S. waters was reported in two of the federally-managed U.S. commercial fisheries in Alaska monitored for incidental mortality and serious injury by fisheries observers: the Bering Sea/Aleutian Islands flatfish trawl (this fishery) and BSAI pollock trawl fisheries (Table 1; Breiwick 2013; MML, unpubl. data). Based on observer data from 2014 to 2018, the minimum average annual rate of mortality and serious injury incidental to U.S. commercial fishing operations is 4.8 ringed seals.

On 28 December 2012, NMFS listed the Arctic ringed seal subspecies (*P. h. hispida*), which corresponds to the Arctic stock of ringed seals, as threatened under the ESA (77 FR 76706). The primary concern for this population is the ongoing and anticipated loss of sea ice and snow cover resulting from climate change, which is expected to pose a significant threat to the persistence of these seals in the foreseeable future (based on projections through the end of the 21st century; Kelly et al. 2010a). Because of its threatened status under the ESA, this stock is designated as depleted under the MMPA and is classified as a strategic stock. The best estimate of the mean annual level of human-caused mortality and serious injury in the U.S. waters portion of the stock is 6,459 ringed seals, which is greater than the negatively biased PBR of 4,755 seals. However, because this exceedance of PBR stems from an unrealistically low minimum population estimate (NMIN), it should not be taken as indicative of a risk to this stock. The PBR was obtained from an NMIN that is known to be an extreme underestimate of the abundance in the U.S. waters of the Bering Sea, which in turn is just a portion of the Arctic ringed seal stock in U.S. waters, and the best estimate of human-caused mortality and serious injury is for the entire U.S. portion of the stock, including, for example, Alaska Native subsistence takes in the Chukchi and Beaufort seas. Previous estimates from the U.S. waters of the Chukchi Sea (Bengtson et al. 2005) and results from a recent (2016) NOAA survey of those waters indicate that there are several hundreds of thousands of ringed seals in that region that are not included in NMIN because the former results are outdated and the latter have not yet been published. Furthermore, ringed seals are known to remain abundant in the U.S. waters of the Beaufort Sea (which are also not included in NMIN) based, for example, on hunter reports to the Ice Seal Committee ISC and NOAA test surveys conducted in 2019. NMFS believes with high confidence that the

⁶ <https://www.fisheries.noaa.gov/s3/2022-08/2021-NORTHERN-FUR-SEAL-Callorhinus-ursinus-Eastern-Pacific-Stock.pdf>

⁷ <https://www.fisheries.noaa.gov/s3/2021-08/RINGED-SEAL-Pusa-hispida-hispida-Arctic-Stock.pdf>

number of ringed seals in Alaska waters greatly exceeds the number of individuals that would be required for the current take to balance the PBR (i.e., $NMIN \times Mortality \text{ and Serious Injury} / PBR = 215,310$ individuals). Therefore, the apparent exceedance of PBR in this case reflects inadequacy in the abundance estimates, rather than an indication of excessive take. The minimum estimated mean annual rate of U.S. commercial fishery-related mortality and serious injury (5 seals) is less than 10% of the negatively biased PBR (10% of PBR = 476) and, therefore, can be considered insignificant and approaching a zero mortality and serious injury rate.

Spotted Seal (Bering stock)⁸

The minimum estimated mean annual level of human-caused mortality and serious injury for the portion of the Bering spotted seal stock in U.S. waters between 2014 and 2018 is 5,254 seals: 1 in U.S. commercial fisheries, 0.4 incidental to MMP-authorized research, and 5,253 in the Alaska Native subsistence harvest (average statewide harvest, including struck and lost animals, in 2015, based on a recently published analysis (Nelson et al. 2019) that is higher and likely more accurate than previous estimates but also revealed stable or decreasing trends in harvest numbers; see below). However, the total mortality and serious injury due to commercial fisheries is unknown because some of the reported harbor seal takes in U.S. commercial fisheries may actually have been spotted seals (since it is virtually impossible to distinguish between these two species without genetic analysis), and there have been no observer programs in nearshore Bristol Bay fisheries that are known to interact with spotted seals. Additional potential threats most likely to result in direct human-caused mortality or serious injury of this stock include the increased potential for oil spills due to an increase in vessel traffic in Alaska waters (with changes in sea-ice coverage)

Between 2014 and 2018, incidental mortality and serious injury of spotted seals in U.S. waters occurred in one of the federally-managed U.S. commercial fisheries in Alaska monitored for incidental mortality and serious injury by fisheries observers: the BSAI flatfish trawl fishery - this UoC (Table 1; Breiwick 2013; MML, unpubl. data). This resulted in a minimum estimated mean annual mortality and serious injury rate of one spotted seal incidental to U.S. commercial fisheries between 2014 and 2018, based exclusively on observer data. Mortality and serious injury of harbor seals incidental to U.S. commercial fisheries occurred between 2014 and 2018 and, because it is virtually impossible to distinguish between harbor seals and spotted seals without genetic analysis, some of the reported harbor seal takes may actually have been spotted seals. Further, there have been no observer programs on nearshore Bristol Bay fisheries that are known to interact with spotted seals, making the total mortality and serious injury due to fisheries unknown.

The Bering spotted seal stock is not designated as depleted under the MMPA or listed as threatened or endangered under the ESA. NMFS completed a comprehensive status review of the spotted seal under the ESA in 2009 (Boveng et al. 2009) and concluded that listing the Bering distinct population segment (DPS) of spotted seals, which corresponds to the Bering stock of spotted seals, was not warranted at that time (73 FR 51615, 20 October 2009). The Bering stock of spotted seals is not considered a strategic stock. The best estimate of the mean annual level of human-caused mortality and serious injury in the portion of the stock in U.S. waters is 5,254 spotted seals, which is less than the PBR (25,394 seals). The minimum estimated mean annual rate of U.S. commercial fishery-related mortality and serious injury (one seal) is less than 10% of the PBR (10% of PBR = 2,539) and, therefore, can be considered insignificant and approaching a zero mortality and serious injury rate.

Steller sea lion (western US stock; Muto et. al. 2020)⁹

The minimum estimated mean annual level of human-caused mortality and serious injury for Western U.S. Steller sea lions between 2014 and 2018 is 254 sea lions: 37 in U.S. commercial fisheries, 0.8 in unknown (commercial, recreational, or subsistence) fisheries, 3.6 in marine debris, 3.6 due to other causes (illegal shooting, mortality incidental to MMPA-authorized research), and 209 in the Alaska Native subsistence harvest. No observers have been assigned to several fisheries that are known to interact with this stock and estimates of entanglement in fishing gear and marine debris based solely on stranding reports in areas west of 144°W longitude may underestimate the entanglement of Western stock animals that travel to parts of Southeast Alaska.

Based on historical reports and their geographic range, Steller sea lion mortality and serious injury could occur in several fishing gear types, including trawl, gillnet, longline, and troll fisheries. However, observer data are limited. Of these fisheries, only trawl fisheries are regularly observed and gillnet fisheries have had limited observations in select areas over short time frames and with modest observer coverage. Consequently, there are little to no data on Steller sea lion mortality and serious injury in non-trawl fisheries. Therefore, the potential for fisheries-caused mortality and serious injury may be greater than is reflected in existing observer data.

Between 2014 and 2018, mortality and serious injury of Western Steller sea lions was observed in 10 of the federally-managed commercial fisheries in Alaska that are monitored for incidental mortality and serious injury by fisheries observers: BSAI Atka mackerel trawl (six individuals in 2017 and 2018), BSAI flatfish trawl, BSAI Pacific cod trawl,

⁸ <https://media.fisheries.noaa.gov/2021-08/SPOTTED-SEAL-Phoca-largha-Bering-Stock.pdf>

⁹ <https://www.fisheries.noaa.gov/s3/2023-06/STELLERSEALIONEumetopiasjubatusWesternU.S.Stock-.pdf>

BSAI pollock trawl, BSAI Pacific cod longline, GOA Pacific cod trawl, GOA Pacific cod longline, GOA flatfish trawl, GOA rockfish trawl (one in 2015), and GOA pollock trawl fisheries, resulting in a mean annual mortality and serious injury rate of 22 sea lions (Table 3; Breiwick 2013; MML, unpubl. data). The minimum estimated mean annual mortality and serious injury rate in U.S. commercial fisheries between 2014 and 2018 is 37 Steller sea lions from this stock (37 from observer data + 0.4 from stranding data) (Tables 3 and 4). No observers have been assigned to several fisheries that are known to interact with this stock, thus, the estimated mortality and serious injury is likely an underestimate of the actual level.

The minimum estimated mean annual U.S. commercial fishery-related mortality and serious injury rate (37 sea lions) is more than 10% of the PBR (10% of PBR = 32) and, therefore, cannot be considered insignificant and approaching a zero mortality and serious injury rate. Based on available data, the minimum estimated mean annual level of human-caused mortality and serious injury (254 sea lions) is below the PBR level (318) for this stock. The Western U.S. stock of Steller sea lions is currently listed as endangered under the ESA and, therefore, designated as depleted under the MMPA. As a result, the stock is classified as a strategic stock.

Seabirds

There are several ESA listed seabirds, and ACAP (Agreement on the Conservation of Albatrosses and Petrels) listed Laysan albatross, which can potentially interact with the UoC fisheries. These are: the endangered short-tailed albatross (*Phoebastria albatrus*), the threatened spectacled eider (*Somateria fischeri*), and the threatened Alaska-breeding population of Steller’s eider (*Polysticta stelleri*). Two other populations of Steller’s eider occur in waters off Alaska but only the Alaska-breeding population is listed under the ESA.

The March 8, 2021 USFWS Biological Opinion (2021 USFWS) for Alaskan groundfish fisheries provides incidental take statements for ESA-listed seabirds:

- The reported take should not exceed six short-tailed albatrosses in a 2-year period.
- The reported take should not exceed 25 spectacled eiders in a floating 4-year period.
- The reported take should not exceed three Steller’s eiders in a floating 4-year period.

These three incidental take statements for ESA-listed seabirds have not been exceeded by all groundfish fisheries at the time of publication of the NMFS seabird report (April 2024) and there were no reported takes of ESA-listed threatened spectacled eider (*Somateria fischeri*) or threatened Alaska-breeding population of Steller’s eider (*Polysticta stelleri*) in 2023 (NMFS 2024).

Table 17 shows the observed mortalities with seabirds in all trawl (pelagic and demersal) fisheries in all waters off Alaska from 2011 to 2020. In this sector, the largest number of interactions are with shearwaters and fulmars, neither of which are threatened, endangered or otherwise of conservation concern. No black footed or short-tailed albatrosses have been encountered in the past 10 years, whereas there have been 91 Laysan albatross interactions since 2018 (80 of them in 2018). Table 13 in Krieger and Eich (2021) breaks this down by groundfish fishery, and shows, of the UoC fisheries, none of them have reported mortalities of blackfooted albatross.

Table 17. Estimated seabird bycatch for Alaska groundfish fisheries using pelagic and non-pelagic trawl gear combined, all fishery management plan areas combined, 2011 to 2020 (this includes all UoC areas of the Bering Sea, Aleutian Islands, and Gulf of Alaska). Source: Krieger and Eich (2021).

Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Ann Avg.
Laysan Albatross	0	0	0	0	0	0	0	80	3	8	9
Black-footed Albatross	0	60	0	0	0	0	0	0	0	0	6
Northern Fulmars	329	297	463	85	463	307	372	418	306	391	343
Shearwaters	3	56	1	72	62	238	928	132	1,781	1	327
Storm Petrels	0	0	0	0	0	0	0	177	0	0	18
Gulls	1	0	3	0	0	3	0	1	0	0	1
Kittiwakes	0	0	0	0	0	0	0	0	13	3	2
Murres	14	0	3	47	0	45	1	0	0	0	11
Auklets	0	0	4	66	0	0	0	102	0	0	17
Cormorants	0	0	0	0	3	0	0	0	0	0	0
Other Alcids	0	0	0	0	0	0	0	0	6	0	1
Other Birds	0	0	0	0	0	0	63	0	0	0	6
Unidentified Birds	0	0	0	0	6	6	0	0	3	0	2
Grand Total	347	413	474	270	534	599	1,364	910	2,112	403	743

Short-tailed albatross

Short-tailed albatross is listed as vulnerable on the IUCN red list, owing to its very small breeding range and relatively small breeding population size at 1,734 individuals (Birdlife International 2023b; ACAP 2017). The population trend is increasing, determined with high confidence (ACAP 2017).

Historical declines were driven by exploitation, the species being targeted primarily for its feathers, but also eggs and oil (ACAP 2009). Today, the main threat is posed by commercial fisheries. The species' distribution overlaps with fisheries that occur in the shallower waters along continental shelf break and slope regions off the coasts of Alaska and British Columbia (Guy *et al.* 2013). The species is also known to be killed in U.S. and Russian longline fisheries for Pacific cod (*Gadus microcephalus*) and halibut. Since 1983, a total of 15 birds have been reported killed by fishing gear (USFWS 2012), but it is widely considered that the actual mortality from bycatch is considerably higher (USFWS 2008, COSEWIC 2013). However, there have been no reports of this species being taken in any of the UoC fisheries in this assessment in recent history.

Laysan albatross (*Phoebastria immutabilis*)

Laysan albatross is an ETP species because it is listed on ACAP, however it is not ESA listed, and its IUCN status is near-threatened, owing to the difficulty in predicting long-term population trends for long-lived bird species, although the population has rebounded from declines in the late 1990s and early 2000s. The population is currently estimated at 1,600,000 mature individuals globally (Birdlife International 2024). None of the UoC fisheries have reported interactions with Laysan albatrosses.

Seabird Mitigation Measure Research

AFSC staff are coordinating with the National Seabird Program to implement a proof-of-concept trial to determine if UV-phased lighting could be a deterrent to procellariid (albatross, fulmar, and shearwater) interactions with vessels. This technology has been tested on airport runways with success. If the technology works on seabirds it could have wide application to reducing seabird mortalities and a follow-up collaborative study would be implemented.

Habitat and ecosystems

Habitat in the EBS, Aleutian Islands and GOA has been mapped at a level of 5 km² grids, and while this level is likely under sampling habitat, the data provide an idea of what is occurring on the seafloor (Figure 5). Figure 6, Figure 7, and Figure 8 show the percentage of area within each grid cell that has been disturbed (2003-2017) for BS, Aleutian Islands, and GOA, respectively. Figure 5 shows a high occurrence of mud and sand and lesser amounts of gravel, cobble, and boulders.

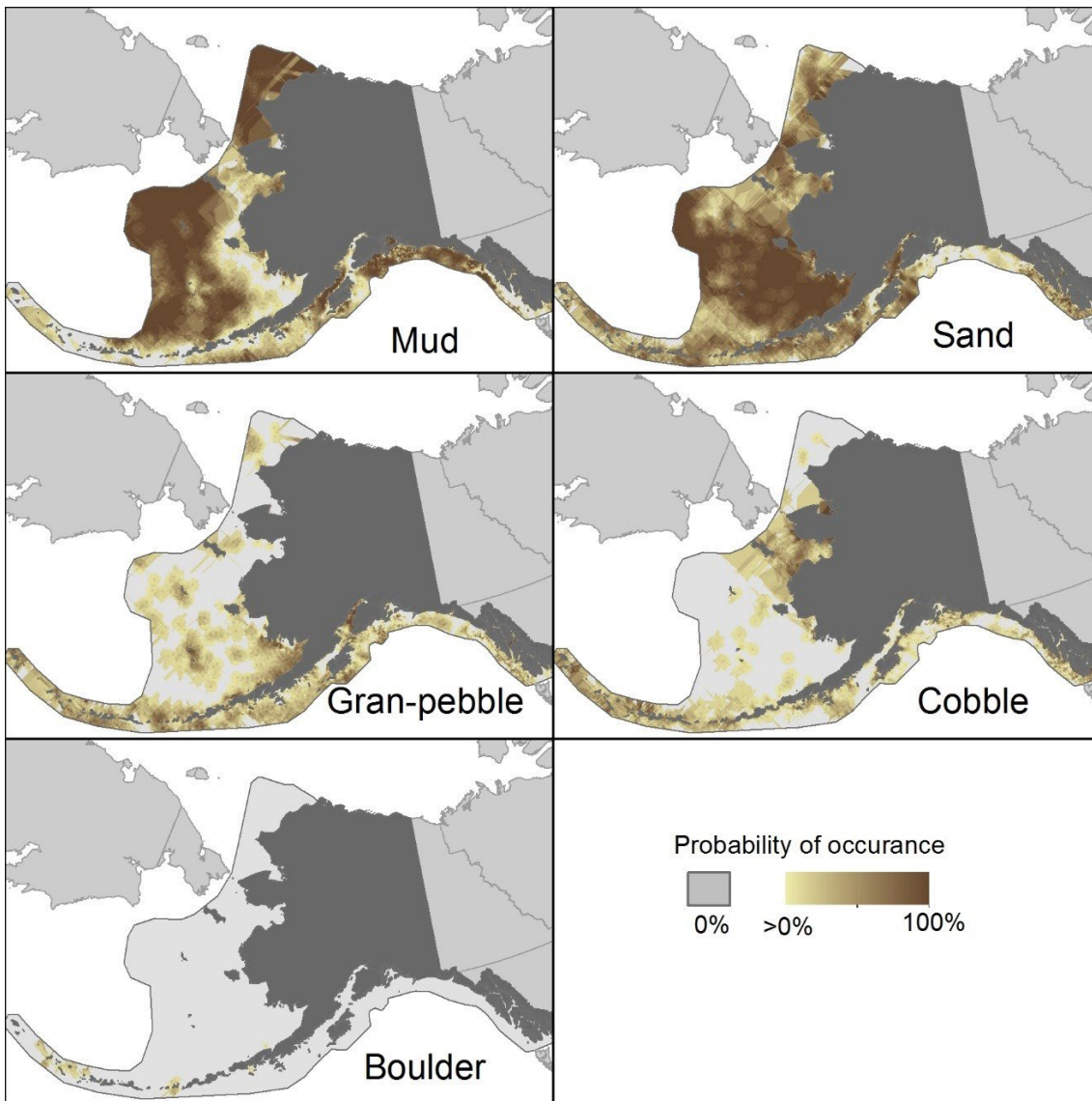


Figure 5. Habitat maps showing the probability of occurrence of the predominant habitat types in the BSAI and GOA. Source: NOAA

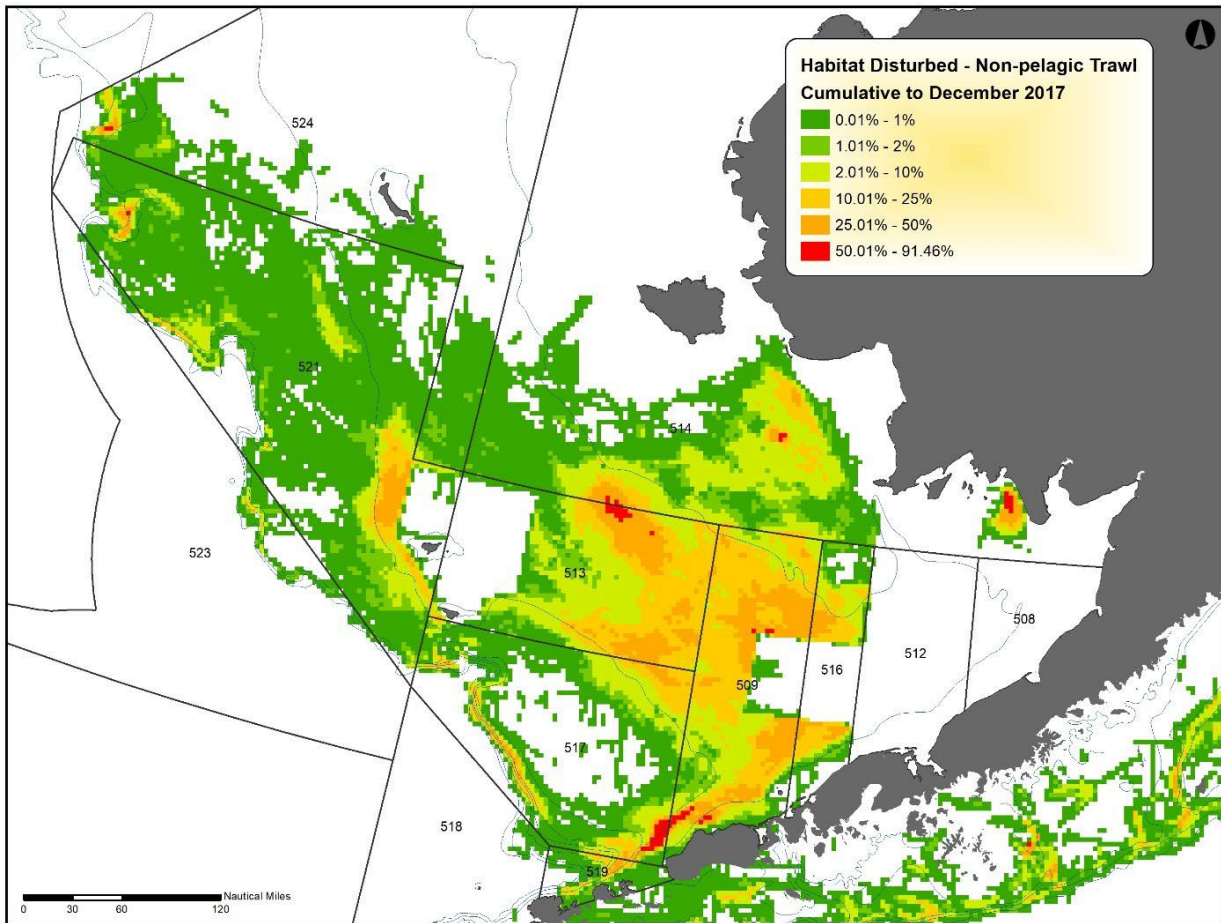


Figure 6. Percentage of area disturbed, 2003-2017, by bottom trawl gear in the BS. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA

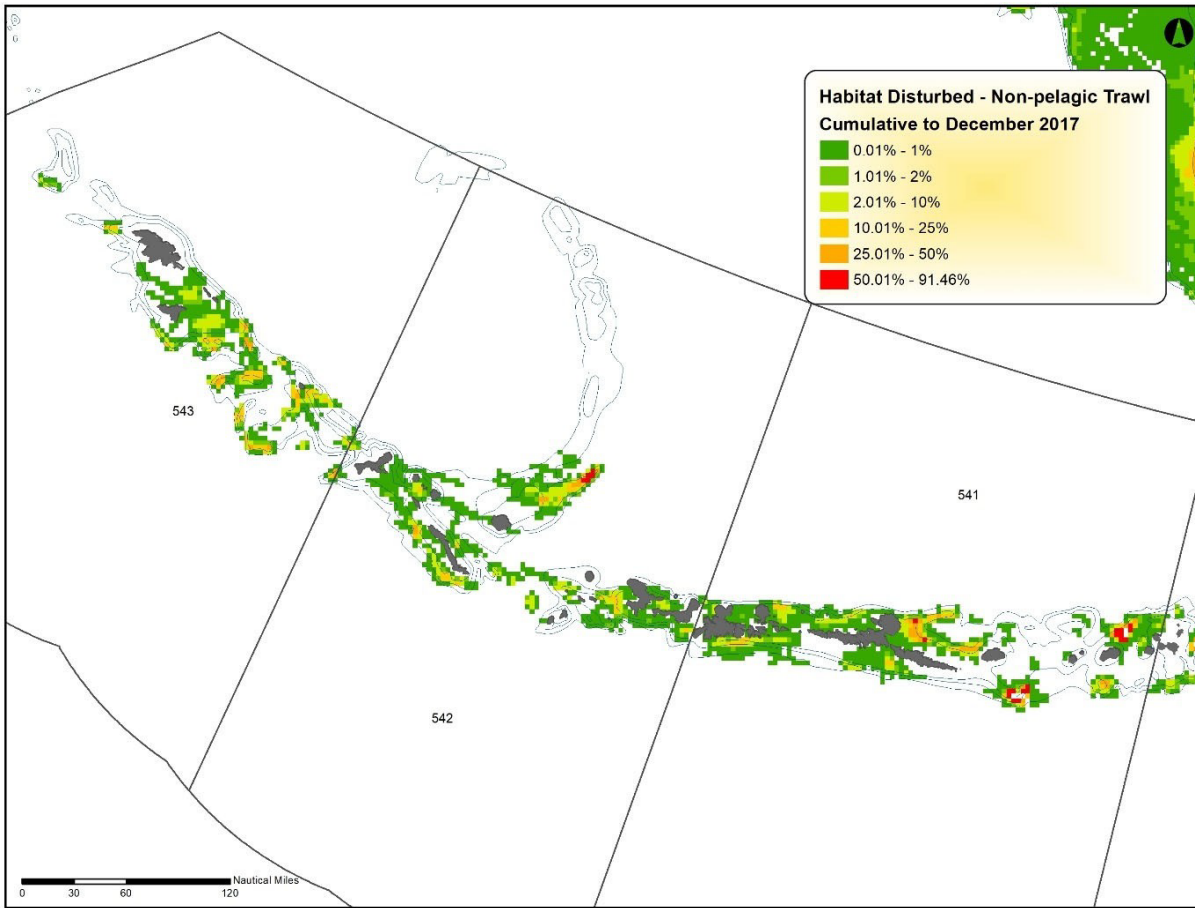


Figure 7. Percentage of area disturbed, 2003-2017, by bottom trawl gear in the AI. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA

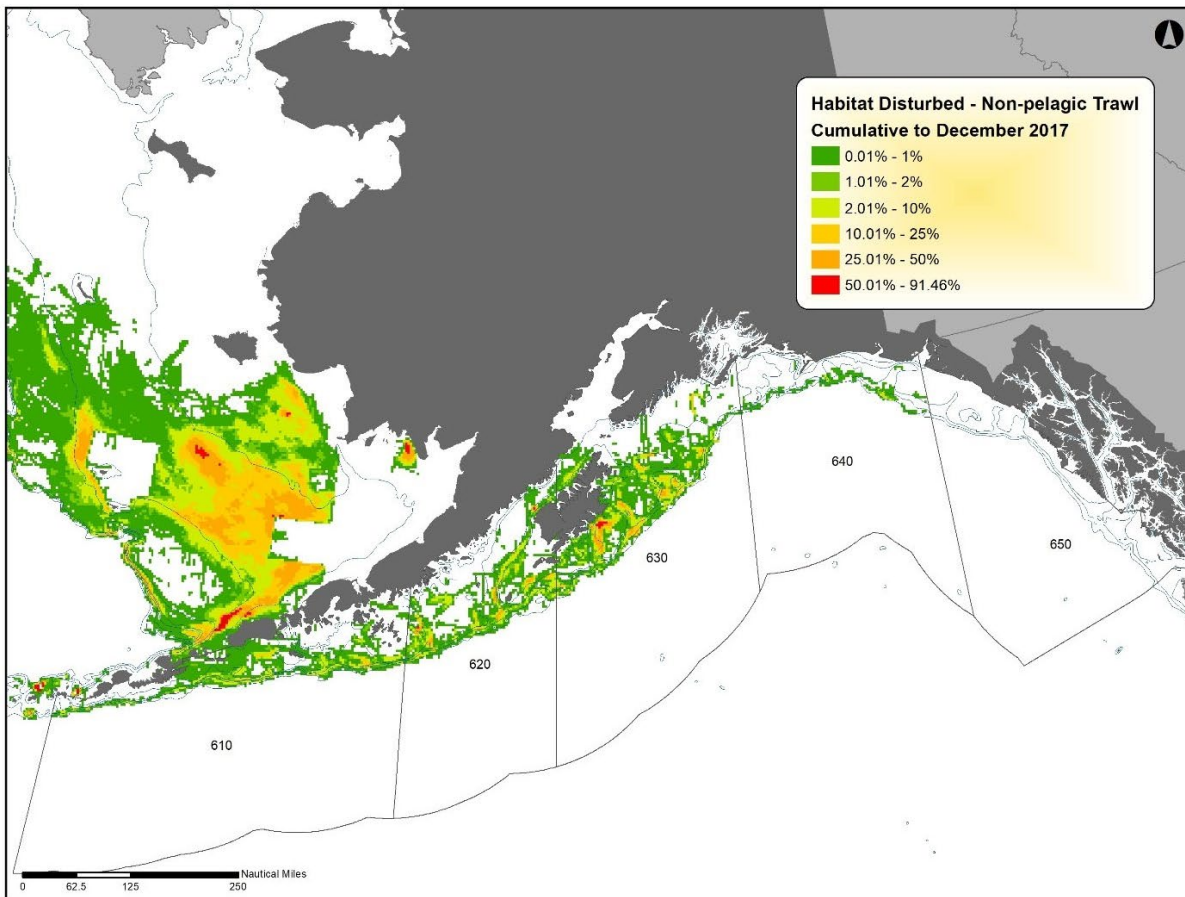


Figure 8. Percentage of area disturbed, 2003-2017, by bottom trawl gear in the GOA. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA

During the NPFMC February 2023 meeting, the Council reviewed the summary report of a 5-year review of essential fish habitat (EFH) components of the Council’s FMPs and initiated an analysis at this meeting to update the Council’s BSAI Groundfish, GOA Groundfish, BSAI King and Tanner Crab, Salmon, and Arctic FMPs’ descriptions and maps of Essential Fish Habitat (EFH). The Council elected not to initiate additional habitat-specific processes at this time (NPFMC 2023).

The Council adopts mitigation measures directed at the adverse impacts of fishing on groundfish EFH. The process of designating EFH and, within EFH, Habitat Areas of Particular Concern (HAPC), is an appropriate mechanism allowing the establishment of “outcome indicators” consistent with achieving management objectives for avoiding, minimizing or mitigating impacts on essential habitats and those highly vulnerable to damage by fishing gear. The principle management measure among these are closed areas to protect sensitive habitats (.).

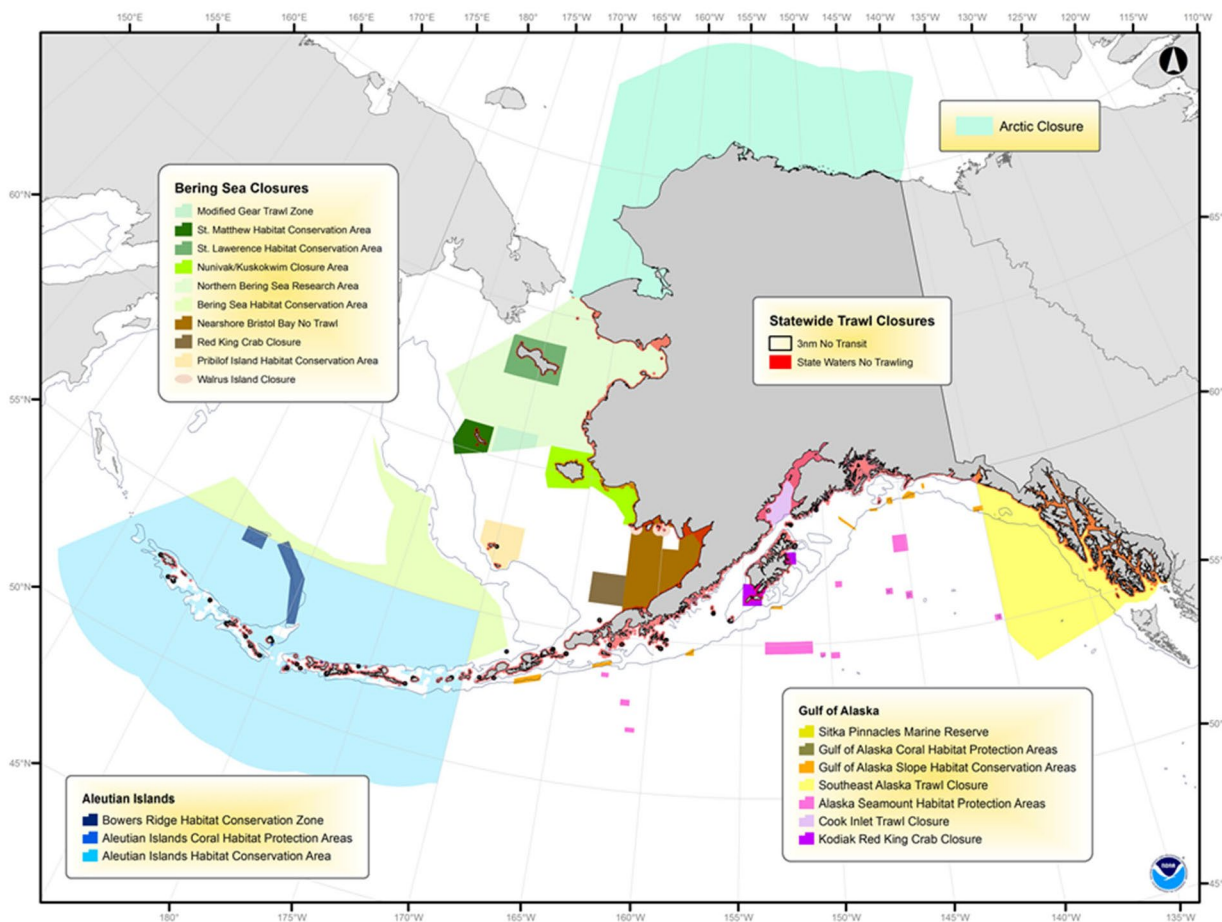


Figure 9. Area closures within the BSAI and GOA. Source: NOAA Fisheries.

The BSAI and GOA groundfish fishery management policies shared by the Alaska Regional Office (AKRO) and the Council have incorporated ecosystem considerations into a broad ecosystem view of the fisheries. Groundfish FMPs are based on ecosystem principles reflected in policy Goals and Objectives. These policy Goals and Objectives were unchanged from 1981 through 2004. In 2005, through the 2004 Alaska Groundfish Programmatic Supplemental Environmental Impact Statement (Alaska Groundfish PSEIS) (NMFS 2004), the management approach and objectives for BSAI and GOA groundfish fisheries were updated. This update included measures to accelerate a precautionary, adaptive management approach through community or rights-based management, ecosystem-based management principles that protect managed species from overfishing, and as appropriate and practicable, increase habitat protection and bycatch constraints. The AKRO and the Council use the management objectives in the 2004 Alaska Groundfish PSEIS as guideposts when considering groundfish FMP amendments. Forty-five management objectives are organized in nine categories: prevent overfishing, promote sustainable fisheries and communities; preserve the 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; and improve data quality, monitoring and enforcement. Fishery policy decisions and annual catch limits are informed by the best scientific information available and management is continually adjusted to account for emerging information.

In 2014, the AKRO and the Council underscored the commitment to Ecosystem Based Fisheries Management (EBFM) by formally adopting an ecosystem approach for fisheries management in the EEZ off Alaska. This approach includes a vision statement adopted by the Council that applies to all long-term planning initiatives, fishery management actions, and science planning to support EBFM. The 2014 overarching ecosystem approach statements and strategy extend the broad EBFM principles, similar to those in the groundfish FMPs, to all fisheries in the Council's jurisdiction.

Ecosystem Status Reports are produced annually to compile and summarize information about the status of the Alaska marine ecosystems for the North Pacific Fishery Management Council, the scientific community and the public. As of 2016, there are separate reports for the EBS, Aleutian Islands, the GOA, and Arctic (forthcoming) ecosystems. These reports include ecosystem report cards, ecosystem assessments, and ecosystem and ecosystem-based

management indicators that together provide context for ecosystem-based fisheries management in Alaska. In addition to the reports themselves, a tool has been developed to help users visualize the ecosystem status in each area, along with a “report card” on ecosystem health. Scientists at the Alaska Fisheries Science Center have begun exploring quantitative linkages among Report Card indicators, illustrating how changes in one variable might affect another (i.e., which indicators are stronger/weaker determinants of trends in other ecosystem components). The method used is dynamic structural equation modeling (DSEM), which can also project next year values and can therefore be used as a tool alongside the Spring PEEC (Preview of Ecosystem and Economic Conditions) meeting to identify emergent trends and potential noteworthy topics to track through summer surveys and research efforts.

Understanding ecosystem structure and function usually begins by organizing indicators within a simplified conceptual model, such that ecological relationships among indicators can be expressed, visualized, and discussed. One simplified approach to visualize relationships among variables is a qualitative network model (QNM) (Levins, 1974). QNMs summarize the relationship among multiple variables (represented as boxes) that are linked by hypothesized mechanisms (represented as arrows), where mechanisms are specified as a positive or negative impact of one variable on another. QNMs have been successfully used at the AFSC to identify likely consequences of hypothetical ecosystem changes (Reum et al., 2015, 2021) and can incorporate stakeholder input regarding relevant variables (boxes) and mechanisms (arrows).

In 2019, NOAA Fisheries published the Alaska Region Implementation Plan for Ecosystem Based Management (NOAA 2019). To implement EBFM, the Policy identifies and outlines six guiding principles:

1. Implement ecosystem-level planning
2. Advance our understanding of ecosystem processes
3. Prioritize ecosystem vulnerabilities and risks
4. Explore and address trade-offs within an ecosystem
5. Incorporate ecosystem considerations into management advice
6. Maintain resilient ecosystems.

The EBFM Roadmap calls for the development of implementation plans to guide NOAA Fisheries’ efforts in implementing EBFM over the next 5 years. The purpose of this Alaska EBFM Roadmap Implementation Plan is to identify and coordinate priority EBFM milestones among the NOAA Fisheries Alaska Regional Office (AKRO), the NOAA Fisheries AFSC and partners in the Alaska Region.

The Council is considering a Programmatic Environmental Impact Statement (PEIS) with the purpose of providing a comprehensive analysis of the cumulative impacts of Alaska’s Federal groundfish fisheries on the human environment given both management and ecosystem changes that have occurred since the last review. The Council indicated that adoption of a final alternative would include updating the Council’s current management policy objectives, noting that it may not be necessary to update every objective. The process of considering a PEIS is intended to incorporate ongoing Council efforts specifically tasked to create more climate-resilient federal fisheries, as applicable (NPFMC 2023).

5 Assessment Process

5.1 RFM assessment process

This assessment is based on the RFM Standard. The Standard is derived from several United Nations Food and Agriculture Organization (UN FAO) documents that are listed in the foreword to the Standard itself. The content of the Standard is organized around four Components of responsible management:

- A. The Fisheries Management System
- B. Science and Stock Assessment Activities and the Precautionary Approach
- C. Management Measures, Implementation, Monitoring, and Control
- D. Serious Impacts of the Fishery on the Ecosystem

The four Components encompass 13 Fundamental Clauses, which in turn encompass 125 Supporting Clauses. Each clause defines a management practice, attribute, or outcome that collectively define a responsibly managed fishery. Conformance to the Standard is assessed by scoring each Supporting Clause according to the RFM Guidance. A full list of clauses can be found in the Standard as well as section 7 of this report.

5.2 Scoring

5.2.1 Evaluation Parameters

Each Supporting Clause is evaluated against performance Evaluation Parameters (EPs). There are several EPs but the Guidance may not require the application of all EPs to a particular clause. EPs include:

Process Evaluation

There is a system in place to implement the aspects of management relevant to the clause, such as systems for data collection, laws and regulations, stock assessments, and enforcement. If evidence on the current process/system of a given process-based requirement is limited or non-existent, then this EP is not satisfied.

Current Status/Appropriateness/Effectiveness

Requires that the current status, appropriateness, or effectiveness of an element of fisheries management practices (whichever of these attributes is relevant to the outputs or outcomes required by the clause) is demonstrated, such as data collected, results of stock assessment including stock status, and enforcement data. If evidence on the current status, appropriateness, or effectiveness of a given output-based requirement is limited or non-existent, then this EP is not satisfied.

Evidence Basis

The availability, quality, or adequacy of the evidence is used for scoring the clause. If evidence availability (such as studies, reports, regulations and other data) is limited, low quality or non-existent, then this EP is not satisfied.

After the assessment team determines whether each EP is met for a Supporting Clause, that clause receives a score of 10 minus 3 for each EP not met, down to a minimum of 1. A confidence rating and conformance level, possibly including a non-conformance (NC), is then assigned to the clause based on the following relationships:

EPs not met	Numeric score	Confidence rating	Conformance level
0	10	High	Full conformance
1	7	Medium	Minor NC
2	4	Medium	Major NC
3+	1	Low	Critical NC

For the fishery to pass the assessment and be recommended for certification, no single Component can have more than:

- 3 minor NCs, if no major NC assigned
- 1 major NC, if no minor NC assigned
- 0 critical NCs

Guidelines for each EP as applied to each Supporting Clause are specified in the Guidance as well as section 7 of this report, and a full detailed description of the scoring system is available in the Guidance.

The assessment steps before and after scoring are specified in the RFM Procedure. Before scoring, the assessment team gathers information to be used in scoring via multiple pathways, including a fishery site visit, voluntary submission of input from stakeholders, and desktop review of available and relevant literature. After scoring, but before a certification decision is made, the client must create a corrective action plan to address any unresolved NCs. Then the draft report with the corrective action plan is peer-reviewed and opened to public comment from stakeholders to identify whether any final revisions to the assessment are needed. Full details of the stages in the assessment and certification process are specified in the Procedure.

5.3 Advance review of topics that trigger immediate assessment failure

The RFM Standard requires that the assessment team review certain fisheries management issues which trigger immediate failure before proceeding to the full assessment. The assessment is not conducted, and the fishery fails immediately if evidence for any of the following problems is found:

- Dynamiting, poisoning, and other comparable destructive fishing practices
- Significant illegal, unreported, and unregulated (IUU) fishing activities in the country jurisdiction

- Shark finning (i.e., removal and retention of shark fins while the remainder of the shark is discarded in the ocean)
- Slavery and slave labor on board fishing vessels
- Any significant lack of compliance with the requirements of an international fisheries agreement to which the U.S. is signatory. A fishery will have to be formally cited by the International Governing body that has competence with the international Treaty in question, and that the US has been notified of that citation of non-compliance.

After a review, the assessment team found no evidence to suggest that any of these problems exist with respect to the fishery under consideration.

6 Assessment Execution

6.1 Site visit

An onsite site visit was held at the offices of the Alaska Seafood Cooperative on March 14th, 2024 in conjunction with the MSC reassessment and 4th surveillance audit for BSAI & GOA Atka mackerel, Pacific Ocean Perch, and rockfish and the Responsible Fisheries Management (RFM) reassessments for Alaska mackerel and rockfish. The following table lists the stakeholders contacted for this reassessment.

Table 18 Stakeholders contacted for the reassessment of AK flatfish complex

Yukon Salmon Fisheries Association
Kawerak
WWF-US
WWF-RU
Food and Water Watch
Monterey Bay Aquarium
Oceana
Ruby Advisory Committee of ADFG
Western Interior Alaska Subsistence Regional Advisory Council
Alaska Natives
IPHC
Greenpeace
Intrafish
Undercurrent News
Alaska Fisheries Development Foundation
Marine Stewardship Council
At-Sea Processors Association
North Pacific Fisheries Management Council
Alaska Fisheries Science Center

Below is a general agenda that was used to guide conversations in relation to this audit.

Client Meeting Agenda

Marine Stewardship Council's (MSC) and the Responsible Fisheries Management (RFM) assessments for BSAI & GOA flatfish, Atka mackerel, rockfish and POP

Date: March 14th, 2024

Location: 4241 21st Ave W, Suite 302, Seattle WA, 98199 (and remote)

Attendees: Beth Concepcion (Client representative); Erin Wilson (Team lead), Dr. Giuseppe Scarcella, Amanda Stern-Pirlot, Michealene Corlett

Other potential attendees:

Mary Beth Tooley, Ruth Christiansen, Annika Saltman, Frank O'Hara III, Chris Woodley, Sarah Webster

Microsoft Teams meeting

Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Meeting ID: 221 646 469 659

Passcode: UHmTY

[Download Teams](#) | [Join on the web](#)

Objectives:

MRAG Americas is conducting the following audits for the BSAI&GOA Atka mackerel, POP and rockfish and BSAI

&GOA flatfish fisheries against the Marine Stewardship Council's (MSC) Standard and/or the Responsible Fisheries Management (RFM) Standard for sustainability.

- MSC Reassessment and 4th surveillance audit for BSAI &GOA Atka mackerel, rockfish and Pacific Ocean Perch
- MSC 3rd surveillance audit for BSAI &GOA flatfish fisheries
- RFM reassessment and 4th surveillance audit for BSAI &GOA Atka mackerel and rockfish fisheries
- RFM reassessment and 4th surveillance audit for BSAI &GOA flatfish fisheries

The objectives of this audit is to meet with managers and stakeholders and gather the best available information to assess whether these fisheries continue to meet the requirements of the MSC and RFM Standard for recertification.

9:30 – 10:15 AM	Introductions, review of agenda and process requirements
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1. Introductions
 - Introductions of the team, their roles, and responsibilities regarding scoring the fishery
 - Client group
2. Overview of the MSC Process
 - The assessment will focus on the following three core Principles:
 - Principle 1 – Sustainable target fish stocks
 - Principle 2 – Environmental impact of fishing
 - Principle 3 – Effective Management
 - Where to find additional materials: Guide to the MSC process
3. Overview of the RFM process
 - V1.3 for the 4th surveillance and v2.01 for the reassessment; Certificate No.: 1000445828-MSC-ANSI-USA
 - Four Components:
 - A. The Fisheries Management System
 - B. Science and Stock Assessment Activities and the Precautionary Approach
 - C. Management Measures, Implementation, Monitoring and Control
 - D. Serious Impacts of the Fishery on the Ecosystem
 - General information on the scoring: The four Components encompass 13 Fundamental Clauses, which encompasses 125 Supporting Clauses. Each Supporting Clause is evaluated against performance Evaluation Parameters (EPs), which include 1) process evaluation; 2) current status/appropriateness/effectiveness; and 3) evidence basis. After the assessment team determines whether each EP is met for a Supporting Clause, that clause receives a score, a confidence rating and conformance level (e.g. Full conformance, or Minor, Major or Critical Non-conformance). Further details regarding the RFM process, information and the Standard ,etc. can be found at the following link: <https://rfmcertification.org>

10:15 -11:30 AM	Review general topics and/or updates for fisheries for both MSC and RFM assessments
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General Topics for discussion:

- General overview of the fishery, including information on the fleet, number of vessels, markets, etc.
- Any potential changes to scientific information, including stock assessments
- Any changes in management/regulation, or recent reviews (e.g. updates on EFH, protected species, bycatch mitigation)
- Changes in personnel, both within the Cooperative, the management agencies, etc.
- Updates on bycatch, any unusual events
- Enforcement update
- Meet with Captain

11:30 – 11:45	Break
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11:45 – 12:30	Review traceability
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- Will work through MSC template for traceability
- Topics include: evidence needs to be presented, e.g. fish tickets, invoices, etc., that has gear, area caught, species, etc.; sorting procedures; how to ensure no mixing of certified with non-certified product, other methods to ensure systems in place (dockside monitoring, observers, permits, etc.); how product is transported, any intermediary actors (e.g. auctions), and where CoC begins

12:30 – ? Questions, review timelines, wrap-up

- MSC Surveillance reports due 60 days from site visit
- Next drafts, process requirements
- Other meetings scheduled
 - John Gauvin 8AM on Friday, March 15th
 - Anne Marie Eich and Hannah Myers 2:00 PM Friday, March 15th, 2024
- Address any information still needed

Thirty days prior to the audit site visit, all stakeholders were informed of the visit and given the opportunity to provide information to the auditors in advance of, or during, the site visit. Managers, stock assessment authors and various stakeholders provided information by email, joined remotely or participated in person during the site visit. Below is a list of the attendees that participated in this site visit.

Name	Title/Role	Organization
Erin Wilson	Assessment team leader and Principle 3 Assessor	MRAG Americas
Amanda Stern-Pirlot	Principle 2 Assessor	MRAG Americas
Michealene Corlett	MRAG Quality Manager (Observer for this assessment)	MRAG Americas
Dr. Giuseppe Scarcella	Principle 1 Assessor	MRAG Americas assessment team member
Beth Concepcion	AKSC Manager	AKSC (Client Representative)
Ruth Christiansen	Director Government Affairs	Ocean Peace
Mary Beth Tooley	Government Affairs	O'Hara Corp.
Frank O'Hara III	Executive Vice President	O'Hara Corp.
Sara Webster	Biologist	AKSC
Chris Woodley	Groundfish Forum Executive Director	AKSC
TJ Durnan	Captain	AKSC
Sana Watterson	Quality Assurance and Traceability Operations	O'Hara
John Gauvin	AKSC Science Projects Director	AKSC
Dr. Anne Marie Eich	Director Protected Resources Policy	NOAA/NMFS
Dr. Hannah Myers	Postdoctoral Scholar	Oregon State University
Melissa Haltuch	Manager of the Status of the Stocks and Multispecies Assessments	Alaska Fisheries Science Center

6.2 Desktop review

The assessment team also conducted a desktop review of available and relevant literature. Sources considered include, but are not limited to:

- Management authority establishment legislation, governance procedures, and reporting, surveillance, and enforcing activities
- Scientific stock assessments and advice, including any international guidance and third-party published stock assessments
- Information from non-governmental organizations

Desktop sources used in the assessment are cited in section 8.

6.3 Stakeholder input

Prior to the assessment site visit, all stakeholders were informed of the visit and given the opportunity to provide information to the assessment team in advance of, or during, the site visit. No stakeholder comments were received during the RFM reassessment of the Alaska flatfish complex fishery.

6.4 Peer review

Peer Review was completed by Paul Knapman and Dr. Susan Hanna.

Paul Knapman is an independent consultant based in Halifax, Nova Scotia, Canada. Paul began his career in fisheries nearly 30 years ago as a fisheries officer in the UK, responsible for the enforcement of UK and EU fisheries regulations. He then worked with the UK government's nature conservation advisors (1993-2001), as their Fisheries Programme Manager, responsible for establishing and developing an extensive programme of work with fisheries managers, scientists, the fishing industry and ENGOs, researching the effects of fishing and integrating nature conservation requirements into national and European fisheries policy and legislation. Between 2001-2004 he was Head of the largest inshore fisheries management organisation in England, with responsibility for managing an extensive area of inshore fisheries on the North Sea coast. The organisations responsibilities and roles included: stock assessments; setting and ensuring compliance with allowable catches; developing and applying regional fisheries regulations; the development and implementation of fisheries management plans; acting as the lead authority for the largest marine protected area in England. In 2004, Paul moved to Canada and established his own consultancy providing analysis, advisory and developmental work on fisheries management policy in Canada and Europe. He helped draft the management plan for one of Canada's first marine protected areas, undertook an extensive review on IUU fishing in the Baltic Sea and was appointed as rapporteur to the European Commission's Baltic Sea Regional Advisory Council. In 2008, Paul joined Moody Marine as their Americas Regional Manager, with responsibility for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul has been involved as a lead assessor, team member and technical advisor/reviewer for more than 50 different fisheries in the MSC programme. He returned to fisheries consultancy in 2015. Paul has passed MSC v1.3, v2.0, v2.1 and ISO 19011 training and has no Conflict of Interest in relation to this fishery. Full CV available upon request.

Dr. Susan Hanna is professor emeritus of marine economics at Oregon State University. Her research and publications are in the area of marine economics and policy, with an emphasis on fishery management, ecosystem-based fishery management, property rights and institutional design. Dr. Hanna has served as a scientific advisor to the U.S. Commission on Ocean Policy, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Minerals Management Service, Northwest Power and Conservation Council and the Pacific Fishery Management Council. She served on the Ocean Studies Board of the National Research Council (NRC), National Academy of Sciences, and several NRC Committees, including the Committee to Review Individual Quotas in Fisheries and the Committee on Protection and Management of Pacific Northwest Anadromous Salmonids.

Full CVs can be provided on request.

The following tables include both the comments from the Peer Reviewers and MRAG's responses.

Fishery **AKFlatfish Complex**

Year	Question	Yes/No	Peer Reviewer justification	CBResponse
	<p>Is the scoring of the fishery consistent with the RFM standard, and clearly based on the evidence presented in the assessment report?</p>	<p>Yes</p>	<p>The report provides a detailed review of the Alaska flatfish fishery operating in the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) and an evaluation against the Responsible Fishing Standard version 2.1.</p> <p>The Background sections of the report are thorough well set out and current and relevant information sources are cited.</p> <p>Section 7.3 of the report which contains the evidence and interpretation that forms the basis for the assessment outcomes is poorly and inconsistently laid out. Supporting Clauses under Fundamental Clauses 1-11 are presented with overarching rationales for each Supporting Clause rather than the emphasis being put on describing and providing evidence for each Evaluation Parameter (EP) for each Supporting Clause. The lay out of Supporting Clauses under Fundamental Clause 12 is different and, while easier to follow, the supporting text that describes the evidence and/or expectation for each EP is set out in separate tables.</p> <p>As a result, it is difficult for the reader to easily assess whether the evidence that has been presented for each EP meets the evidence requirements that would achieve full conformance of each EP and therefore achievement of each Supporting Clause. In order for me to check if the rationales met the EP evidence requirements I had to have the Scoring Guidance open next to me so I could more easily cross-check EP requirements required with what was presented in the rationales.</p> <p>I briefly reviewed all of the 10 current certification reports on the RFM website to see how the evaluation and outcome have been presented - this includes the MRAG US Pacific Hake /Whiting</p>	<p>Thank you for the comment. As there is no required template for use with the RFM Standard v2.1, we tried to create a template that reduced the redundancy of the rationale within the sub clauses and the many evaluation parameters. The template is a work in progress and we will consider this feedback in future revisions.</p>

Fishery, Full Assessment Report. All of them have used very similar approaches in presenting their evaluations. Each Supporting Clause has been set out individually along with each EP and associated supporting text that describes the type of evidence and/or expectation that would achieve full conformance. The Assessment Teams have then inserted evidential text under each EP and included references that substantiate/support this evidence. I've cut and pasted the generic structure of the evaluation table for a Supporting Clause below. Using this format helps the reader understand what the requirements/expectation is for each EP for the Supporting Clause and see what evidence the Assessment team have used to make their evaluation of the EP.

While I appreciate the approach taken in this Alaska flatfish report may help to reduce repetition and streamline the writing process it does not serve well those wishing or required to review whether the fishery meets the RFM standard and I strongly recommend that Section 7.3 is revised accordingly.

			<p>Fishery, Full Assessment Report. All of them have used very similar approaches in presenting their evaluations. Each Supporting Clause has been set out individually along with each EP and associated supporting text that describes the type of evidence and/or expectation that would achieve full conformance. The Assessment Teams have then inserted evidential text under each EP and included references that substantiate/support this evidence. I've cut and pasted the generic structure of the evaluation table for a Supporting Clause below. Using this format helps the reader understand what the requirements/expectation is for each EP for the Supporting Clause and see what evidence the Assessment team have used to make their evaluation of the EP.</p> <p>While I appreciate the approach taken in this Alaska flatfish report may help to reduce repetition and streamline the writing process it does not serve well those wishing or required to review whether the fishery meets the RFM standard and I strongly recommend that Section 7.3 is revised accordingly.</p>	
	<p>Are the non-conformities raised appropriately written to achieve the prescribed outcome within the specified time frame?</p>	<p>NA</p>	<p>There are no non-conformities</p>	

General comments on the report (e.g. Executive summary, background, UoAs). Add extra rows if needed.	In reviewing the report I used track changes to highlight possible edits and attach this separately.	
Additional comments		

Section A: The Fisheries Management System

Clause	Has all available relevant info been used to score this FC?	Does the information and/or rationale used to score this FC support the given score?	Peer Reviewer comments	CB Response
1. Structured and legally mandated management system				
1.1	Yes	Yes	The role of the State (ADFG) in relation to the UoC is not clearly described. Does the fishery operate in state waters? Are there parallel flatfish fisheries?	Additional rationale has been provided for further clarification.
1.2	Yes	Yes	EP Current Status / Appropriateness / Effectiveness: There is no comment in the rationale about the geographic extent of the stock or any migratory behaviors. While this might not apply to any of the species it should still be stated.	The rationale has been revised.
1.2.1	Yes	Yes	No comment	
1.3	N/A	N/A	No comment	
1.3.1	N/A	N/A	EP Process is indicated as being met but these are not transboundary stocks	This has been revised to NA.
1.4	N/A	N/A	EP Process is indicated as being met but these are not transboundary stocks	This has been revised to NA.

1.4.1	N/A	N/A	EP Process is indicated as being met but these are not transboundary stocks	This has been revised to NA.
1.5	N/A	N/A	The report indicates that this clause is met, however, it is not applicable as the flatfish stock in the UoC are not considered to be transboundary. Also, all EPs are indicated as being met.	This has been revised to NA.
1.6	Yes	Yes	No comment	
1.6.1	N/A	N/A	No comment	
1.7	Yes	Yes	No comment	
1.8	Yes	Yes	No comment	
1.9	N/A	N/A	No comment	
2. Coastal area management frameworks				
2.1	Yes	Yes	No comment	
2.1.1	Yes	Yes	No comment	
2.1.2	Yes	Yes	No comment	
2.2	Yes	Yes	No comment	
2.3	Yes	Yes	No comment	
2.4	Yes	Yes	No comment	
2.5	Yes	Yes	No comment	
2.6	Yes	Yes	No comment	
2.7	Yes	Yes	No comment	
3. Management objectives and plan				
3.1	Yes	Yes	No comment	
3.1.1	Yes	Yes	No comment	
3.1.2	Yes	Yes	No comment	
3.1.3	Yes	Yes	No comment	
3.2	N/A	N/A	No comment	

3.2.1	No	No	The rationale does not provide evidence to support the fulfillment of all parameters, i.e., no mention of avoidance of excess fishing capacity or economic conditions that promote responsible fisheries.. Limited access privilege program? One of the goals of Amendment 80 is to limit harvesting capacity for fisheries not managed by a LAPP.	The rationale has been revised.
3.2.2	No	No	The rationale does not provide evidence to support the fulfillment of all parameters, i.e., no mention of economic conditions that promote responsible fisheries	The rationale has been revised.
3.2.3	Yes	Yes	No comment	
3.2.4	Yes	Yes	No comment	

Section B: Science & Stock Assessment Activities, and the Precautionary Approach

Clause	Has all available relevant info been used to score this FC?	Does the information and/or rationale used to score this FC support the given score?	Peer Reviewer comments	CBResponse
4. Fishery data				
4.1	Yes	Yes	No comment	
4.1.1	Yes	Yes	No comment	
4.1.2	Yes	Yes	No comment	
4.2	Yes	Yes	No comment	
4.2.1	Yes	Yes	No comment	
4.3	Yes	Yes	No comment	
4.4	Yes	Yes	No comment	

4.5	Yes	Yes	No comment	
4.6	Yes	Yes	No comment	
4.7	N/A	N/A	No comment	
4.8	N/A	N/A	No comment	
4.9	N/A	N/A	No comment	
4.1	N/A	N/A	No comment	
4.11	N/A	N/A	No comment	
5. Stock assessment				
5.1	No	No	While it is clear there is an institutional framework for fishery management purposes, as set out in Clause 1.1, there is no mention of it here.	Thank you for the comment, the rationale is now modified to better describe the institutional framework.
5.1.1	N/A	N/A	No comment	
5.1.2	Yes	Yes	No comment	
5.2	Yes	Yes	No comment	
5.3	Yes	Yes	No comment	
5.4	N/A	N/A	No comment	
5.5	N/A	N/A	There is no mention of how or whether confidentiality is respected, if appropriate.	Thank you for the comment, the rationale is now modified to address the comment.
6. Biological reference points and harvest control rule				
6.1	Yes	Yes	No comment	
6.2	Yes	Yes	No comment	
6.3	Yes	Yes	No comment	
6.4	Yes	Yes	No comment	
6.5	Yes	Yes	No comment	
7. Precautionary approach				
7.1	Yes	Yes	No comment	
7.1.1	Yes	Yes	No comment	
7.1.2	NA	NA	No comment	
7.2	NA	NA	No comment	

Section C: Management Measures, Implementation, Monitoring, and Control

Clause	Has all available relevant info been used to score this FC?	Does the information and/or rationale used to score this FC support the given score?	Peer Reviewer comments	CBResponse
8. Management measures				
8.1	Yes	Yes	No comment	
8.1.1	Yes	Yes	No comment	
8.1.2	Yes	Yes	No comment	
8.2	Yes	Yes	No comment	
8.3	Yes	Yes	No comment	
8.4	Yes	Yes	No comment	
8.4.1	No	No	There is no evidence of studies that provide an understanding of the costs, benefits, and effects of alternative management options designed to rationalize fishing, especially options relating to excess fishing capacity and excessive levels of fishing effort	This comment has been addressed in the rationale.
8.5	Yes	Yes	No comment	
8.5.1	Yes	Yes	No comment	
8.6	Yes	Yes	No comment	
8.7	Yes	Yes	No comment	
8.8	Yes	Yes	No comment	
8.9	Yes	Yes	No comment	
8.1	NA	NA	This clause need not apply if new gears haven't been introduced in the last 3 years. There is no mention of new gears and so consider if it applies.	This has been revised to NA

	No	Yes	Recommend including The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee. https://www.psmfc.org/tsc-drafts/2024/AFSC_2024_TSC_Report.pdf	
8.11				
8.12	Yes	Yes	No comment	
8.13	NA	NA	No comment	
9. Appropriate standards of fishers' competence				
9.1	Yes	Yes	No comment	
9.2	No	No	No evidence provided to support this SC	
9.3	Yes	Yes	No comment	
10. Effective legal and administrative framework				
10.1	Yes	Yes	No comment	
10.2	Yes	Yes	No comment	
10.3	NA	NA	No comment	
10.3.1	NA	NA	No comment	
10.4	NA	NA	No comment	
10.4.1	NA	NA	No comment	
11. Framework for sanctions				
11.1	Yes	Yes	No comment	
11.2	Yes	Yes	No comment	
11.3	Yes	Yes	No comment	
11.4	NA	NA	No comment	

Section D: Serious Impacts of the Fishery on the Ecosystem

Clause	Has all available relevant info been used to score this FC?	Does the information and/or rationale used to score this FC support the given score?	Peer Reviewer comments	CBResponse
12. Impacts of the fishery on the ecosystem				

12.1	Yes	Yes	No comment	
12.2	NA	NA	No comment	
12.2.1	Yes	Yes	No comment	
12.2.2	Yes	Yes	No comment	
12.2.3	Yes	Yes	No comment	
12.2.4	Yes	Yes	No comment	
12.2.5	Yes	Yes	No comment	
12.2.6	Yes	Yes	No comment	
12.2.7	Yes	Yes	No comment	
12.2.8	Yes	Yes	No comment	
12.2.9	Yes	Yes	No comment	
12.2.10	Yes	Yes	No comment	
12.2.11	Yes	Yes	No comment	
12.3	Yes	Yes	No comment	
12.4	Yes	Yes	No comment	
12.5	Yes	Yes	No comment	
12.6	Yes	Yes	No comment	
12.7	Yes	Yes	No comment	

Peer Reviewer B

Fishery **AK flatfish complex**

Year	Question	Yes/No	Peer Reviewer justification	CBResponse
	Is the scoring of the fishery consistent with the RFM standard, and clearly based on the evidence presented in the assessment report?	Yes	Overall, scoring is justified based on the evidence. Areas where minor additions are needed for full justification are noted.	Thank you
	Are the non-conformities raised appropriately written to achieve the prescribed outcome within the specified timeframe?	NA	No non-conformances were found for this fishery.	No response needed

	General comments on the report (e.g. Executive summary, background, UoAs). Add extra rows if needed.		This is a well written and comprehensive report, well documented.	Thank you
	Additional comments			

Section A: The Fisheries Management System

Clause	Has all available relevant info been used to score this FC?	Does the information and/or rationale used to score this FC support the given score?	Peer Reviewer comments	CBResponse
1. Structured and legally mandated management system				
1.1	Yes	Yes	Agree with rationale and scoring	No response needed.
1.2	Yes	Yes	Agree with rationale and scoring	No response needed.
1.2.1	Yes	Yes	Agree with rationale and scoring	No response needed.
1.3	NA		Agree with determination that 1.3 is not relevant	No response needed.
1.3.1	NA		Agree with determination that 1.3.1 is not relevant	No response needed.
1.4	NA		Agree with determination that 1.4 is not relevant	No response needed.
1.4.1	NA		Agree with determination that 1.4.1 is not relevant	No response needed.
1.5	Yes	Yes	Agree with scoring and most of the rationale, but some explicit reference to how the system is fostering cooperation between states is needed.	This has been changed to NA based on other PR response.
1.6	Yes	Yes	Agree with rationale and scoring	No response needed.
1.6.1	NA		Agree with determination that 1.6.1 is not relevant	No response needed.
1.7	Yes	Yes	Agree with rationale and scoring	No response needed.

1.8	Yes	Yes	Agree with scoring and most of the rationale. References to transparency are implied but not explicit in "evidence of continuous compliance", paragraphs 4,6 and 7. Adding the term "transparency" where appropriate in those paragraphs would strengthen the explanation.	The rationale has been revised.
1.9	NA	Yes	Agree with determination that 1.9 is not relevant	No response needed.
2. Coastal area management frameworks				
2.1	Yes	Yes	Agree with rationale and scoring. Reference to NS8 could be added here.	Thank you for the comment. A reference to NS8 has been added.
2.1.1	Yes	Yes	Agree with rationale and scoring. Reference to 2.1.1 should be added to para 1 (or 4,5?) in rationale	This has been added.
2.1.2	No, see comment	No	Para 1 of the rationale references 2.1.2 but does not address technical capacities of financial resources of fishery interests. It is implied by the existence of collaborative decision processes but not explicit. It looks like para 5 should reference 2.1.2 instead of 2.2.	Noted and revised.
2.2	Yes	Yes	Agree with rationale and scoring	No response needed.
2.3	Yes	Yes	Agree with rationale and scoring	No response needed.
2.4	Yes	Yes	Agree with rationale and scoring	No response needed.
2.5	Yes	Yes	Agree with rationale and scoring	No response needed.
2.6	Yes	Yes	Agree with rationale and scoring	No response needed.
2.7	Yes	No	Explicit reference to 2.7 and "timely information" is needed	This has been added.
Y				
3.1	Yes	Yes	Agree with rationale and scoring	No response needed.
3.1.1	Yes	Yes	FMP objectives cover this; SC 3.1.1 should be cited with the list of objectives	These clauses were cited at the bottom of the objectives.
3.1.2	Yes	Yes	FMP objectives cover this; SC 3.1.2 should be cited with the list of objectives	These clauses were cited at the bottom of the objectives.

3.1.3	Yes	Yes	FMP objectives cover this; SC 3.1.3 should be cited with the list of objectives	These clauses were cited at the bottom of the objectives.
3.2	NA		NA	
3.2.1	Yes	Yes	FMP objectives cover this; SC 3.2.1 should be cited with the list of objectives	This has been revised.
3.2.2	Yes	Yes	FMP objectives cover this; SC 3.2.2 should be cited with the list of objectives	This has been revised.
3.2.3	Yes	Yes	FMP objectives cover this; SC 3.2.3 should be cited with the list of objectives	This has been revised.
3.2.4	Yes	Yes	FMP objectives cover this; SC 3.2.4 should be cited with the list of objectives	This has been revised.

Section B: Science & Stock Assessment Activities, and the Precautionary Approach

Clause	Has all available relevant info been used to score this FC?	Does the information and/or rationale used to score this FC support the given score?	Peer Reviewer comments	CB Response
4. Fishery data				
4.1	Yes	Yes	Agree with rationale and scoring	No response needed.
4.1.1	Yes	Yes	Agree with rationale and scoring	No response needed.
4.1.2	NA		Agree with determination that 4.1.2 is not relevant	No response needed.
4.2	Yes	Yes	Agree with rationale and scoring	No response needed.
4.2.1	Yes	Yes	Agree with rationale and scoring	No response needed.
4.3	Yes	Yes	Agree with rationale and scoring	No response needed.
4.4	No	No	More information is needed as to how the research supports national policy (e.g. MSA National Standards).	Additional rationale has been provided.

4.5	No	No	Explicit reference is needed to economic, social, marketing and institutional knowledge as well as data collection and analysis generating this knowledge.	This has been revised.
4.6	No	No	Explicit reference to traditional knowledge is needed.	This has been revised.
4.7	NA		Agree with determination that 4.7 is not relevant	No response needed.
4.8	NA		Agree with determination that 4.8 is not relevant	No response needed.
4.9	NA		Agree with determination that 4.9 is not relevant	No response needed.
4.1	NA		Agree with determination that 4.10 is not relevant	No response needed.
4.11	NA		Agree with determination that 4.11 is not relevant	No response needed.
5. Stock assessment				
5.1	Yes	Yes	Agree with rationale and scoring	No response needed.
5.1.1	NA		Agree with determination that 5.1.1 is not relevant	No response needed.
5.1.2	Yes	Yes	Agree with rationale and scoring	No response needed.
5.2	Yes	Yes	Agree with rationale and scoring	No response needed.
5.3	Yes	Yes	Agree with rationale and scoring	No response needed.
5.4	NA		Agree with determination that 5.4 is not relevant	No response needed.
5.5	Yes	Yes	Agree with rationale and scoring	No response needed.
6. Biological reference points and harvest control rule				
6.1	Yes	Yes	Agree with rationale and scoring	No response needed.
6.2	Yes	Yes	Agree with rationale and scoring	No response needed.
6.3	Yes	Yes	Agree with rationale and scoring	No response needed.
6.4	Yes	Yes	Agree with rationale and scoring	No response needed.

6.5	Yes	Yes	Agree with rationale and scoring. A section reference error in "current status" section needs attention	This has been corrected.
7. Precautionary approach				
7.1	Yes	Yes	Agree with rationale and scoring. It would be helpful to have 7.1 cited in the rationale.	This has been revised.
7.1.1	Yes	Yes	Agree with rationale and scoring. It would be helpful to have SC 7.1.1 cited in the rationale.	This has been revised.
7.1.2	NA		Agree with determination that 7.1.2 is not relevant	No response needed.
7.2	NA		Agree with determination that 7.2 is not relevant	No response needed.

Section C: Management Measures, Implementation, Monitoring, and Control

Clause	Has all available relevant info been used to score this FC?	Does the information and/or rationale used to score this FC support the given score?	Peer Reviewer comments	CB Response
8. Management measures				
8.1	Yes	Yes	Agree with rationale and scoring	No response needed.
8.1.1	Yes	Yes	Agree with rationale and scoring. There is no reference to 8.1.1 but it could be added to the Para on AFCS ESSRP	This has been revised.
8.1.2	Yes	Yes	Agree with rationale and scoring. There is no reference to 8.1.2 but it could be added to FMP objectives 14-21	Thank you. This has been revised.
8.2	Yes	Yes	Agree with rationale and scoring	No response needed.
8.3	Yes	Yes	Agree with rationale and scoring. There is no reference to 8.3 but it could be added to FMP objectives 35-37	Thank you. This has been revised.

8.4	Yes	No	Agree with scoring and most of rationale but some explicit reference to excess capacity should be added	Thank you. This has been revised.
8.4.1	Yes	No	Agree with scoring and most of rationale but some explicit reference to excess capacity should be added	Thank you. This has been revised.
8.5	Yes	Yes	Agree with rationale and scoring	No response needed.
8.5.1	Yes	Yes	Agree with rationale and scoring	No response needed.
8.6	Yes	Yes	Agree with rationale and scoring	No response needed.
8.7	Yes	Yes	Agree with rationale and scoring	No response needed.
8.8	Yes	Yes	Agree with rationale and scoring	No response needed.
8.9	Yes	Yes	Agree with rationale and scoring. There is no reference to 8.9 but it could be added to legal gears para of rationale	This has been revised.
8.1	Yes	Yes	Agree with rationale and scoring	No response needed.
8.11	Yes	Yes	Agree with rationale and scoring	No response needed.
8.12	Yes	Yes	Agree with rationale and scoring	No response needed.
8.13	NA		Agree with determination that 8.13 is not relevant	No response needed.
9. Appropriate standards of fishers' competence				
9.1	Yes	Yes	Agree with rationale and scoring	No response needed.
9.2	Yes	No	Agree with scoring and most of the rationale but some reference to CCRF should be added to rationale with cite for SC 9.2	This has been added
9.3	Yes	Yes	Agree with rationale and scoring	No response needed.
10. Effective legal and administrative framework				
10.1	Yes	Yes	Agree with rationale and scoring	No response needed.
10.2	Yes	Yes	Agree with rationale and scoring	No response needed.
10.3	NA		Agree with determination that 10.3 is not relevant	No response needed.
10.3.1	NA		Agree with determination that 10.3.1 is not relevant	No response needed.
10.4	NA		Agree with determination that 10.4 is not relevant	No response needed.
10.4.1	NA		Agree with determination that 10.4.1 is not relevant	No response needed.
11. Framework for sanctions				

11.1	Yes	Yes	Agree with rationale and scoring	No response needed.
11.2	Yes	Yes	Agree with rationale and scoring	No response needed.
11.3	Yes	Yes	Agree with rationale and scoring	No response needed.
11.4	NA		Agree with determination that 11.4 is not relevant	No response needed.

Section D: Serious Impacts of the Fishery on the Ecosystem

Clause	Has all available relevant info been used to score this FC?	Does the information and/or rationale used to score this FC support the given score?	Peer Reviewer comments	CBResponse
12. Impacts of the fishery on the ecosystem				
12.1	Yes	Yes	Agree with rationale and scoring	No response required
12.2	NA		Agree with determination that 12.2 is not relevant	No response required
12.2.1	Yes	Yes	Agree with rationale and scoring	No response required
12.2.2	Yes	Yes	Agree with rationale and scoring	No response required
12.2.3	Yes	Yes	Agree with rationale and scoring	No response required
12.2.4	Yes	Yes	Agree with rationale and scoring	No response required
12.2.5	Yes	Yes	Agree with rationale and scoring	No response required
12.2.6	Yes	Yes	Agree with rationale and scoring	No response required
12.2.7	Yes	Yes	Agree with rationale and scoring	No response required
12.2.8	Yes	Yes	Agree with rationale and scoring	No response required
12.2.9	Yes	Yes	Agree with rationale and scoring	No response required
12.2.10	Yes	Yes	Agree with rationale and scoring	No response required
12.2.11	Yes	Yes	Agree with rationale and scoring	No response required
12.3	Yes	Yes	Agree with rationale and scoring	No response required
12.4	NA		Agree with determination that 12.4 is not relevant	No response required
12.5	Yes	Yes	Agree with rationale and scoring	No response required
12.6	Yes	Yes	Agree with rationale and scoring	No response required

12.7	Yes	No	Agree with scoring and most of the rationale. The "process" section of the rationale details the generation of information that can support the consideration of MPAs; explicitly stating this connection would strengthen the discussion. The overall score for FC 12 still needs to be filled in.	Thank you, this connection as well as the score have been added
13. Fisheries enhancement activities (remove if not applicable)				
13.1	NA		No supporting clauses under FC 13 are applicable to this fishery because fishery enhancement is not used.	No response required

7 Assessment Outcome

7.1 Summary of scores

Scores for each Supporting Clause are fully justified in section 7.3 and summarized in Table 19

Table 19. Summary of assessment scores.

Component	Fundamental Clause	Supporting Clause	Numeric score	Confidence rating	Conformance level
A Fisheries Management System	1	1.1	10	High	Full
		1.2	10	High	Full
		1.2.1	10	High	Full
		1.3	NA	NA	NA
		1.3.1	NA	NA	NA
		1.4	NA	NA	NA
		1.4.1	NA	NA	NA
		1.5	10	High	Full
		1.6	10	High	Full
		1.6.1	NA	NA	NA
		1.7	10	High	Full
		1.8	10	High	Full
		1.9	NA	NA	NA
	2	2.1	10	High	Full
		2.1.1	10	High	Full
		2.1.2	10	High	Full
		2.2	10	High	Full
		2.3	10	High	Full
		2.4	10	High	Full
		2.5	10	High	Full
		2.6	10	High	Full
	2.7	10	High	Full	
	3	3.1	10	High	Full
		3.1.1	10	High	Full
		3.1.2	10	High	Full
		3.1.3	10	High	Full
		3.2	NA	NA	NA
		3.2.1	10	High	Full
		3.2.2	10	High	Full
		3.2.3	10	High	Full
3.2.4	10	High	Full		
B Science and Stock Assessment Activities and the Precautionary Approach	4	4.1	10	High	Full
		4.1.1	10	High	Full
		4.1.2	10	High	Full
		4.2	10	High	Full
		4.2.1	10	High	Full
		4.3	10	High	Full
		4.4	10	High	Full
		4.5	10	High	Full
		4.6	10	High	Full
		4.7	NA	NA	NA
		4.8	NA	NA	NA
		4.9	NA	NA	NA
		4.10	NA	NA	NA
	4.11	NA	NA	NA	
	5	5.1	10	High	Full
		5.1.1	NA	NA	NA
		5.1.2	10	High	Full
		5.2	10	High	Full
		5.3	10	High	Full

Component	Fundamental Clause	Supporting Clause	Numeric score	Confidence rating	Conformance level	
		5.4	NA	NA	NA	
		5.5	10	High	Full	
	6	6.1	10	High	Full	
		6.2	10	High	Full	
		6.3	10	High	Full	
		6.4	10	High	Full	
		6.5	10	High	Full	
	7	7.1	10	High	Full	
		7.1.1	10	High	Full	
		7.1.2	NA	NA	NA	
		7.2	NA	NA	NA	
	C Management Measures, Implementation, Monitoring, and Control	8	8.1	10	High	Full
			8.1.1	10	High	Full
8.1.2			10	High	Full	
8.2			10	High	Full	
8.3			10	High	Full	
8.4			10	High	Full	
8.4.1			10	High	Full	
8.5			10	High	Full	
8.5.1			10	High	Full	
8.6			10	High	Full	
8.7			10	High	Full	
8.8			10	High	Full	
8.9			10	High	Full	
8.10			10	High	Full	
8.11			10	High	Full	
8.12		10	High	Full		
8.13		NA	NA	NA		
9		9.1	10	High	Full	
		9.2	10	High	Full	
		9.3	10	High	Full	
10		10.1	10	High	Full	
		10.2	10	High	Full	
		10.3	NA	NA	NA	
		10.3.1	NA	NA	NA	
		10.4	NA	NA	NA	
11		10.4.1	NA	NA	NA	
		11.1	10	High	Full	
		11.2	10	High	Full	
	11.3	10	High	Full		
D Serious Impacts of the Fishery on the Ecosystem	12	11.4	NA	NA	NA	
		12.1	10	High	Full	
		12.2	NA	NA	NA	
		12.2.1	10	High	Full	
		12.2.2	10	High	Full	
		12.2.3	10	High	Full	
		12.2.4	10	High	Full	
		12.2.5	10	High	Full	
		12.2.6	10	High	Full	
		12.2.7	10	High	Full	
		12.2.8	10	High	Full	
		12.2.9	10	High	Full	
		12.2.10	10	High	Full	
		12.2.11	10	High	Full	
		12.3	10	High	Full	
12.4	NA	NA	NA			
12.5	10	High	Full			
12.6	10	High	Full			
12.7	10	High	Full			

Component	Fundamental Clause	Supporting Clause	Numeric score	Confidence rating	Conformance level
	13	All	NA	NA	NA

7.2 Non-conformances and corrective actions

The assessment team identified no non-conformances.

The scores in section 7.1 satisfy the requirements for certification established by the Guidance. On this basis, MRAG Americas recommends that the AK flatfish fishery be re-certified under the RFM Standard v2.1.

7.3 Full scoring rationales

This section contains the evidence and interpretation that forms the basis for the assessment outcomes. Each table contains the text of a Supporting Clause and its Evaluation Parameters. Fundamental Clauses are not scored directly but are included for organization and reference.

Fundamental Clause 1

There shall be a structured and legally mandated management system based upon and respecting international, State, and local fishery laws, for the responsible utilization of the stock under consideration and conservation of the marine environment.

Supporting Clause	Met? (Yes/No/NA)
1.1 <i>There shall be an effective legal and administrative framework established at international, State and local levels appropriate for fishery resource conservation and management. The management system and the fishery operate in compliance with the requirements of international, State, and local laws and regulations, including the requirements of any regional and/or international fisheries management agreement.</i>	Yes
1.2 <i>Management measures shall consider (1) stock status (i.e., overfished, biomass) and genetic diversity (stock structure) over its entire area of distribution, and (2) other biological characteristics of the fish stock (stock) including age of maturity and reproductive potential.</i>	Yes
1.2.1 <i>Previously agreed management measures established and applied in the same region shall be taken into account by management.</i>	Yes
1.3 <i>Where transboundary, shared, straddling, highly migratory, or high seas fish stocks are exploited by two or more States (neighbouring or not), the applicant and appropriate management organizations concerned shall cooperate and take part in the formal fishery commission or arrangements appointed to ensure effective conservation and management of the stock(s) in question and their environment.</i>	N/A
1.3.1 <i>Conservation and management measures established for the stock under consideration within the jurisdiction of the relevant States for transboundary, shared, straddling, highly migratory, or high seas stocks, shall be compatible in a manner consistent with the rights, competence, and interests of the States concerned.</i>	N/A
1.4 <i>A State's fishery management organization not member or participant of a sub-regional or regional fisheries management organization shall cooperate, in accordance with relevant international agreements and law, in the conservation and management of the relevant fisheries resources by giving effect to any relevant measures adopted by such organization or arrangement.</i>	N/A
1.4.1 <i>A fishery management organization seeking to take any action through a non-fishery organization which may affect the conservation and management measures taken by a competent sub-regional or regional fisheries management organization or arrangement shall consult with the latter, in advance to the extent practicable, and take its views into account.</i>	N/A
1.5 <i>The applicant fishery's management system, when appropriate for the stock under consideration, shall actively foster cooperation between States with regard to (1) information gathering and exchange, (2) fisheries research, (3) fisheries management, and (4) fisheries development.</i>	N/A

1.6	<i>A fishery management organization and sub-regional or regional fisheries management organizations and arrangements, as appropriate, shall agree on the means by which the activities of such organizations and arrangements will be financed, bearing in mind, inter alia, the relative benefits derived from the fishery and the differing capacities of States to provide financial and other contributions. Where appropriate, and when possible, such organizations and arrangements shall aim to recover the costs of fisheries conservation, management, and research.</i>	Yes
1.6.1	<i>Without prejudice to relevant international agreements, States or fishery management organizations shall encourage banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership where such a requirement would have the effect of increasing the likelihood of non-compliance with international conservation and management measures.</i>	N/A
1.7	<i>Within the fishery management system, procedures shall be in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review, and to revise or abolish them in the light of new information.</i>	Yes
1.8	<i>The management arrangements and decision-making processes for the fishery shall be organized in a transparent manner.</i>	Yes
1.9	<i>Management organizations not party to the Agreement to Promote Compliance with International Conservation and Management Measures by Vessels Fishing on the High Seas shall be encouraged to accept the Agreement and to adopt laws and regulations consistent with the provisions of the Agreement.</i>	N/A

Rationale

Evidence of continuous compliance with the fundamental clause:

Considerable resources in the form of stock assessment, ecosystem monitoring and management expertise and capacity; management organizations and structures (e.g., National Marine Fisheries Service (NMFS) Alaska region, the North Pacific Fishery Management Council (NPFMC, or Council), NOAA Fisheries Office of Law Enforcement (OLE), United States Coast Guard (USCG), and the Observer Program are dedicated to fisheries, including AK flatfish, in Alaskan federal waters. National legislation and the regulatory process by which the Council and NMFS are directed and follow, enable the management of the resource at regional and localized levels. The adaptive and consultative management approach adopted by the Council actively promotes stakeholder participation. The NOAA Office of General Council (OGC) reviews any proposed management action to assure compliance with the Magnuson-Stevens Act (MSA). International obligations (e.g., combating Illegal, Unreported and Unregulated (IUU) fishing) and the enforcement of federal regulations are upheld by the federal departments such as USCG and OLE (**Supporting Clauses [SC] 1.1; 1.2.1**).

The NPFMC is the regional council responsible for managing North Pacific Ocean fisheries in the federal EEZ off the coast of Alaska. For most federal groundfish fisheries Alaska Department of Fish and Game (ADFG) issues emergency orders for state waters that duplicate NMFS management actions, however gear restrictions may vary. The BSAI and GOA flatfish fisheries are all federally managed fisheries. 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, 2024). In accordance with the MSA, the Council has functions and responsibilities that are also outlined in the Statement of Organization, Practices and Procedures (SOPP). There is also a Science and Statistical Committee (SSC), Advisory Panel (AP), Plan Teams, and other committees that provide input to the Council, and their roles with decision making are outlined in the SOPP as well (**SC 1.1**).

The assessment models used take into account all sources of fishing mortality and are based on complete catch reporting systems including extensive observer data. Catches from fisheries occurring in state-managed waters are included in the appropriate assessments. All retained catch and discards AK flatfish are included in the total catch amounts input into the models. The assessments consider various relevant aspects of target stocks biology and distribution. The assessments of AK flatfish are age-structured, use a Bayesian approach, consider sources of uncertainty where possible, and evaluate stock status relative to reference points in a probabilistic way. SAFE reports give extensive histories of the models used in the assessments (see: <https://www.fisheries.noaa.gov/tags/north-pacific-groundfish-stock-assessments>). Additionally, in BSAI and GOA models exploring stock status in relation to changing environmental conditions have also been developed

and evaluated, in some of the models also the target stocks of the present report are considered (see: <https://www.noaa.gov/resource/data/ecosystem-status-report-2023-eastern-bering-sea>; <https://www.fisheries.noaa.gov/resource/data/ecosystem-status-report-2023-aleutian-islands>; <https://www.fisheries.noaa.gov/resource/data/ecosystem-status-report-2023-gulf-alaska>) (SC 1.2; 1.7). Each model uses information on the status of the stock and potential effects of current management practices. Fisheries of the exclusive economic zone (EEZ) off Alaska; Bering Sea and Aleutian Islands; Final 2024 and 2025 Harvest Specifications for Groundfish can be found at the following link: <https://www.federalregister.gov/documents/2024/03/11/2024-05093/fisheries-of-the-exclusive-economic-zone-off-alaska-bering-sea-and-aleutian-islands-final-2024>. The Final 2024 and 2025 GOA Harvest Specifications can be found at the following: <https://www.federalregister.gov/documents/2024/03/04/2024-04516/fisheries-of-the-exclusive-economic-zone-off-alaska-gulf-of-alaska-final-2024-and-2025-harvest>.

The Council routinely reviews its management plans and actions as part of standard operating procedure. The Council's FMPs explicitly describe the Council's transparent policy and commitment to review management issues, and this is reflected in the numerous Council meetings that take place each year. Similarly, the Alaska Department of Fish and Game (ADFG) Board of Fisheries (BOF) websites have dedicated pages to their public meetings and agendas and outcomes reflect a commitment to review previously agreed management measures (SC 1.7; 1.8).

There is an agreed system to finance the fishery management organizations and arrangements. In general, the costs of fisheries management and conservation are funded through Congressional and state appropriations that follow the federal and state budget cycles. Cost recovery from certain fleet sectors, including BSAI and GOA flatfish stocks, is also in operation. The MSA authorizes and requires the collection of cost recovery fees for the incremental costs of limited access privilege programs. Cost recovery fees recover the actual costs directly related to the management, data collection, and enforcement of the programs. The current groundfish observer program is a further example of management being financially supported through cost recovery. Estimates of the costs for federal and state management, research, and enforcement of the groundfish stocks in the BSAI and GOA are reported in the BSAI and GOA Groundfish FMPs (SC 1.6).

There are procedures at multiple levels to review management measures, and the MSA is reviewed by Congress every five years and is periodically revised and reauthorized. The adaptive management approach taken in the BSAI and GOA groundfish fisheries requires regular and periodic review. Component parts of the FMPs are regularly reviewed, including outcome indicators, and various levels of Environmental Impact Statements (EIS) are undertaken when the FMPs are amended in order to review the environmental and socio-economic consequences, as well as assess the effectiveness of the changes. Stakeholders are actively encouraged to participate in Council and BOF meetings and, in so doing, opportunity to review management measures is provided. Stock status is reviewed and updated annually, producing SAFE reports for the BSAI and GOA groundfish stocks. ADFG also conducts scientific research and surveys on its state-managed groundfish fisheries. These SAFE reports document stock status and significant trends or changes in the resource, marine ecosystems and fishery over time. The reports also assess the relative success of existing state and Federal fishery management programs and based on stock status indicators, provide recommendations for annual quotas and other fishery management measures (SC 1.2; 1.2.1; 1.7; 1.8).

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 approximately seven 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 personnel, administrative, or litigation issues. A report of each meeting of the Council, except for any closed session, shall be kept and contain a record of the persons present, a complete and accurate description of matters discussed, and conclusions reached, and copies of all statements filed. The summary report, combined with the detailed newsletter, time log, and audio/visual recordings of the meeting, are intended to meet the requirements for minutes as described in Section 302(i)(2)(E) of the MSA. The Council (and NMFS) as well as the BOF (and ADFG) provide substantial amounts of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourage stakeholder participation, and all Council and BOF deliberations are conducted in open, public session. Anyone may submit regulatory proposals, and all such proposals are given due consideration by both the Council and the BOF (SC 1.7; 1.8).

The fisheries operate within the EEZ and the stocks are not transboundary. The stocks are not considered to be a transboundary, straddling, highly migratory, or high seas stock and so there is no international component of the fishery to take into account. Clauses 1.3, 1.3.1, 1.4; 1.5, 1.6.1 and 1.9 are not applicable.

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Evaluation Parameter Rationale - Process	Met? (Yes/No/NA)
1.1 Management agencies are physically and legally established at international, State and local levels	NA
1.2 None	NA
1.2.1 There is a process or system that allows the continuity and updating of previously agreed and implemented management measures. Examples may include a specific review process or management plan where these measures can be clearly identified and continued implementation and updating can be carried out.	Yes
1.3 There is a mechanism in place by which the applicant organization(s) cooperates for the management of the transboundary, shared, straddling, highly migratory or high seas stock. This mechanism has the sustainable total exploitation of the stock as its main objective.	NA
1.3.1 Identification of common objectives for maintenance of stock biomass.	NA
1.4 There is ongoing cooperation in stock assessment, data sharing, and other activities.	NA
1.4.1 There is history of prior consultation.	NA
1.5 The extent to which a formal process or system is available.	NA
1.6 There is an agreed-upon system to finance the fishery management organizations and arrangements.	Yes
1.6.1 There is a system that encourages banks to require vessels to be flagged within the jurisdiction of interest.	NA
1.7 There is a procedure to review management measures. The procedure includes the use of outcome indicators against which the success of management measures in achieving specific management objectives is measured. The procedure covers all management measures, including those relating to the sustainable exploitation of the target stock; the mitigation of negative impacts on non-target species through bycatch, discarding, and indirect effects; and the protection of Endangered, Threatened, Protected (ETP) species and the physical environment. Please note that both the management processes of the North Pacific Fishery Management Council (NPFMC) for federal waters, and the Alaska Board of Fisheries (BOF) for state waters, allow for the continuous review of conservation and management measures. Such processes shall be clearly documented as relevant to key management measures for the fishery under assessment.	Yes
1.8 None	NA
1.9 Regulation to implement the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas has been adopted. Assessors shall consult the following document http://www.fao.org/docrep/meeting/003/x3130m/X3130E00.htm for reference to the Agreement.	NA
Rationale: Please see the rationale for the supporting clauses. There are no transboundary, straddling, or highly migratory stocks in this fishery so 1.3, 1.4, 1.4.1, 1.5 and 1.9 are not applicable.	

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No/NA)
1.1 The output of the management organization(s) is in line with fishery resource management needs. Examples may include rule making, scientific research, stock and	Yes

<p>ecosystem assessments, implementation of rules and regulations, and enforcement activities.</p> <p>The management framework is appropriate for managing the resource. For example, the larger the exploitation, vulnerability, or risks of a fish stock, the more work and precision (assessment of the resource ensuring the risks related to overfishing and equivalent negative effects) shall be focused in managing the resource. This shall be done in compliance with legislative and regulatory requirements at the local, national, and international level, including the requirements of any regional fisheries management agreement. The management system shall not be subject to continual unresolved or repeated disputes or political instability.</p>	
<p>1.2 If a stock is subject to two or more jurisdictions (nations, states, etc) (either by distribution or migration), then exploitation by all jurisdictions shall be considered when defining exploitation levels and determining stock status to avoid overfishing/depletion of the resource. The scoring of this parameter shall consider that significant migration may take a species outside the jurisdiction of the managing agency (e.g., for significant feeding or ontogenetic migration).</p> <p>Managers shall have an understanding of stock structure and composition as these relate to stock resilience over its entire distribution area. The underlying objective is to preserve genetic diversity between and within species, and avoid localized depletions (overall affecting the stock contributing to its resilience and stability). This assessment shall consider, when appropriate, demographic independence of populations or stocks (i.e., if a component stock of a species is demographically independent from another because it is genetically different, has significant difference in age structure, or if there is insignificant exchange among groups due to distance, environmental barriers, or other reasons).</p> <p>The stock may spend a portion of its life (migration for feeding, growth, or reproduction) in both fresh and saltwater, in international waters, or in another jurisdiction, and may suffer mortality or other pressures. These must be accounted for when assessing stock status.</p>	Yes
<p>1.2.1 Previously agreed management measures established and applied in the same region are included and part of current management decisions. Examples may include international or other agreements not honored by the management system or a management agency. The management system is effectively continuing implementation of agreed management measures.</p>	Yes
<p>1.3 There is evidence that the mechanism described in the process parameter is effective at ensuring the stock is sustainably exploited. This can take the form of evidence that the stock is not overfished or subject to overfishing across the entirety of the range of the stock.</p>	NA
<p>1.3.1 Implementation of measures to achieve the common objectives mentioned above (i.e., similar harvest rates based on stock status, common rebuilding objectives for depleted stocks).</p>	NA
<p>1.4 Relevant measures are implemented by non-member States.</p>	NA
<p>1.4.1 The views of the managing fishery organization are taken into account.</p>	NA
<p>1.5 Level of activity, application, and level of engagement.</p>	NA
<p>1.6 The fishery management organizations and arrangements are currently financed using a cost recovery or other system.</p>	Yes
<p>1.6.1 There is regulation that directs for vessels to be flagged outside the State's jurisdiction. The fishery for the stock under consideration occurs outside EEZ, and there are flags of convenience operations present, or evidence of IUU fishing.</p>	NA
<p>1.7 If, as a result of the review process, it is determined that management measures are not achieving the specific management objectives they are designed to achieve, they are revised and updated as appropriate.</p>	Yes
<p>1.8 There is transparency in management arrangements. Please note that both the management processes of the NPFMC for federal waters, and the BOF for state waters, shall be clearly documented to provide evidence for the transparency of these arrangements and decision-making processes.</p>	Yes
<p>1.9 There are laws regulating high seas fishing activity. Describe how they accomplish this.</p>	NA

Rationale:

The stocks for the UoC are only fished in the EEZ of the Bering Sea and Aleutian Islands, are federally managed and are not considered migratory. Flatfish in the BSAI are predominately found on the eastern Bering Sea continental shelf and slope, with lower abundance in the Aleutian Islands for those species whose range extends to that area. Each of the flatfish species is assessed as a single unit in the BSAI. In the GOA, the flatfish assemblage has been divided into several categories for management purposes. Catch limits for flatfish are specified separately for the deep water flatfish complex (Dover sole, Greenland turbot, and deep-sea sole), rex sole, the shallow water flatfish complex (rock sole, yellowfin sole, Alaska plaice, and other flatfish), flathead sole, and arrowtooth flounder (NPFMC, 2020; 2020b).

As noted in the rationale above for supporting clauses, there is a legally mandated management system that annually, the Council develops harvest specifications based on information from the SSC, AP, Groundfish plan teams, the public, and any other relevant information (NPFMC, 2023) 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, 2023). This fishery operates only in Alaska’s EEZ so sub clauses and evaluation parameters referring to transboundary stocks or fishing on the high seas are not applicable.

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No/NA)
<i>1.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that an effective legal and administrative framework established at the local and national level is appropriate for fishery resource conservation and management. In addition, the management system and the fishery operate in compliance with the requirements of local, national, and international laws and regulations, including the requirements of any regional fisheries management agreement. Examples may include fishery management plans or other relevant information.</i>	Yes
<i>1.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that management measures consider (1) the stock status over its entire area of distribution, (2) the area through which the stock migrates during its life cycle, and (3) other biological characteristics of the stock. Examples may include the presence of genetic studies, age structure data, stock assessments or other relevant information.</i>	Yes
<i>1.2.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that previously agreed management measures established and applied in the same region are taken into account by management.</i>	Yes
<i>1.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that where transboundary, shared, straddling, highly migratory, or high seas fish stocks are exploited by two or more States, the applicant and appropriate management organizations concerned cooperate and take part in formal fishery discussions or arrangements that have been appointed to ensure effective conservation and management of the stock(s) and fisheries in question. Examples may include evidence of formal agreements, records of meetings, and decisions.</i>	NA
<i>1.3.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that conservation and management measures established for the stock within the jurisdiction of the relevant States for shared, straddling, high seas, or highly migratory stocks, are compatible in a manner consistent with the rights, competences, and interests of the States concerned. Examples may include evidence of formal agreements, records of meetings and decisions, stock assessment, and other reports.</i>	NA
<i>1.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the State non-member or participant of a sub-regional or regional fisheries management organization cooperates, in accordance with relevant international agreements and law, in the conservation and management of the relevant fisheries resources by giving effect to any relevant measures adopted by such organization or arrangement. Examples may include reports detailing results of common surveys or acceptable harvest rates.</i>	NA
<i>1.4.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that a fishery management organization seeking to take any action through a non-fishery organization which may affect the conservation and management measures taken by a competent sub-regional or regional fisheries management</i>	NA

<i>organization or arrangement consults with the latter, in advance to the extent practicable, and take its views into account. Examples may include reports detailing action taken by the State(s) in question.</i>	
<i>1.5 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the applicant's fishery management system, when appropriate for the stock under consideration, fosters active international cooperation on fishery matters with regard to information gathering and exchange, fisheries research, fisheries management, and fisheries development. Example of evidence sources may include outputs from activity (e.g., reports, minutes, common or collective themes).</i>	NA
<i>1.6 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is agreement on the means by which the activities of such organizations and arrangements are financed. Where appropriate, and when possible, such organizations and arrangements aim to recover the costs of fisheries conservation, management, and research. Examples may include data showing the expenditure and cost recovery derived from fisheries management.</i>	Yes
<i>1.6.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the State or fishery management organizations encourages banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership where such a requirement would have the effect of increasing the likelihood of non-compliance with international conservation and management measures. Examples may include data showing fishery operation by vessels flying a flag different from that of the State where fishing geographically occurs.</i>	NA
<i>1.7 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that within the fishery management system, procedures are in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review, and to revise or abolish them in the light of new information. Examples may include data showing recent regulation or management plan revisions.</i>	Yes
<i>1.8 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the management arrangements and decision-making processes for the fishery are organized in a transparent manner. Examples may include records of the management arrangements and decision-making processes.</i>	Yes
<i>1.9 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization is party to the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, or has adopted laws and regulations consistent with the provisions of the Agreement. Examples may include reports on the management of high seas fishing activities.</i>	NA
Rationale:	
As noted above, the process used by the Council for decision-making is described in the SOPP, and mandated by the MSA. Evidence of the review process and transparent management system can be seen in the BSAI and GOA FMPs, meeting minutes, and in the SAFE reports. The Council also developed a groundfish work plan that integrates the management objectives with recent, current, ongoing, and pending Council actions and statements. The status of this work plan is updated at every meeting and is reviewed under the "Staff Tasking" agenda item. The work plan includes cumulative actions taken by the Council under the policy since 2004. The addition of actions over the course of each year contributes to that list and facilitates the mandatory annual review of the policy (NPFMC, 2023). This fishery operates only in Alaska's EEZ so evaluation parameters referring to transboundary stocks or fishing on the high seas are not applicable.	

	Starting score	- (Number of EPs NOT met x 3) =	Overall score
	10	0	10
Numerical score:			
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High
Corresponding Conformance Level:			Full Conformance

(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)	
Non-conformance Number (if applicable):	NA

Fundamental Clause 2

Management organizations shall participate in coastal area management, decision-making processes and activities related to the fishery and its users, supporting sustainable and integrated resource use, and conflict avoidance.

Supporting Clause		Met? (Yes/No/NA)
2.1	<i>Within the fisheries management organization's jurisdiction, an appropriate policy, legal, and institutional framework shall be adopted in order to achieve sustainable and integrated use of living marine resources, (1) taking into account the fragility of coastal ecosystems and finite nature of their natural resources, (2) allowing for determination of the possible uses of coastal resources and governing access to them, and (3) recognizing the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development. In setting policies for the management of coastal areas, States shall take due account of the risks and uncertainties involved.</i>	Yes
2.1.1	<i>States shall establish mechanisms for cooperation and coordination in planning, development, conservation, and management of coastal areas.</i>	Yes
2.1.2	<i>The fisheries management organization shall ensure that the authority or authorities representing the fisheries sector and fishing communities in the coastal management process have the appropriate technical capacities and financial resources.</i>	Yes
2.2	<i>Representatives of the fisheries sector and fishing communities shall be consulted in the decision-making processes involving activities related to coastal area management planning and development. The public, as well as others affected, shall also be kept aware of the need for protection and management of coastal resources, and shall participate in the management process.</i>	Yes
2.3	<i>Fisheries practices that avoid conflict among fishers and other users of the coastal area (e.g., fisheries enhancement facilities, tourism, energy) shall be adopted, and fishing shall be regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear, and fishing methods. Procedures and mechanisms shall be established at the appropriate administrative level to settle conflicts that arise within the fisheries sector and between fisheries resource users and other coastal users.</i>	Yes
2.4	<i>States' fisheries management organizations and sub-regional or regional fisheries management organizations and arrangements shall give due publicity to conservation and management measures and ensure that laws, regulations, and other legal rules governing their implementation are effectively disseminated. The bases and purposes of such measures shall be explained to users of the resource in order to facilitate their application and thus gain increased support in the implementation of such measures.</i>	Yes
2.5	<i>The economic, social, and cultural value of coastal resources shall be assessed by the appropriate fisheries management organization in order to assist decision making on their allocation and use.</i>	Yes

2.6	<i>States shall cooperate to support and improve coastal area management, and in accordance with capacities, measures shall be taken to establish or promote (1) systems for research and monitoring of the coastal environment, and (2) multidisciplinary research of the coastal area using physical, chemical, biological, economic, social, legal, and institutional capabilities.</i>	Yes
2.7	<i>In the case of activities that may have an adverse environmental effect on coastal areas of other States, States shall provide timely information and if possible, prior notification to potentially affected States, and consult with those States as early as possible.</i>	Yes

Rationale

In managing the Alaska flatfish fisheries, NMFS, in conjunction with the Council and Alaska Department of Fish & Game (ADFG), participate in coastal area management-related issues through processes established by the National Environmental Policy Act (NEPA), which requires that all federal agencies' funding or permitting decisions be made with full consideration of the impact to the natural and human environment. An environmental review process is required that includes a risk evaluation and evaluation of alternatives including a "no action" alternative. The Council and the BOF system were designed so that fisheries management decisions were made at the regional level to allow input from affected stakeholders. Council meetings are open, and public testimony is taken on issues prior to deliberations and final decisions. In doing so, the management organizations within Alaska and their management processes take into account the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development. The MSA contains ten National Standards with which all fishery management plans (FMPs) must conform and which guide fishery management (NOAA 2023). National Standard 8 specifically states that *"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."*¹⁰ (SC 2.1; 2.1.1; 2.1.2).

The Council and BOF websites actively encourage and demonstrate participation by stakeholders at their respective public meetings and cover a wide range of topics regarding the use, development and management of coastal resources. Potential conflict between fishermen and other coastal users at the federal level are usually discussed and resolved through the NEPA process and, at the state level, through the BOF public meeting process or regional committee established as part of the state's land use and access planning processes (SC 2.2; 2.3; 2.4).

As part of the management approach of the Council, identification of legal gear types and seasons to distribute harvest are implemented to avoid gear conflicts, reduce bycatch and marine mammal interactions (SC 2.3). There are also community protections, where harvest quotas are set aside for communities. The Groundfish Management Objectives in the FMPs are reviewed annually by the Council in order to modify, eliminate, or consider new issues to best carry out the goals and objectives of its management policy. These objectives include: prevent overfishing, promote sustainable fisheries and communities, preserve the 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, and improve data quality, monitoring and enforcement¹¹ (SC 2.1; 2.4; 2.5; 2.6).

Canada abuts the U.S. border to the south and shares certain fisheries resources, however the GOA stocks are not considered to be transboundary. The United States and Canada have a very strong working relationship at both the national and regional levels. In cases involving boundary disputes and treaties governing fishery access, the USCG, NOAA, and Canadian Department of Fisheries and Oceans (DFO) along with Canadian Coast Guard counterparts have effectively coordinated living marine resource enforcement efforts despite occasional related political and economic tensions. There are established agreements and shared management and working practice (e.g., International Pacific Halibut Commission (IPHC), Pacific Salmon Treaty, an agreement between the U.S. and Canada on enforcement (SC 2.1.1, 2.3).

The technical capacities of the federal and state agencies involved in the management of Alaska flatfish are significant, and include internationally recognized scientists, experienced fishery managers and policy makers and highly professional and trained enforcement officers. Appropriate technical and financial resources are in place. A joint protocol is in place between the Council and ADFG which provides the intent to provide long term cooperative, compatible management systems that maintain the sustainability of the fisheries resources in federal and state waters (SC 2.1.1).

¹⁰ <https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-guidelines>

¹¹ <https://www.npfmc.org/how-we-work/management-policies/>

The MSA requires the Council and other groups (BOF, ADGF, etc.) to hold public meetings within their respective regions to discuss the development and amendment of FMPs. These meetings are publicized by the Council and stakeholders actively encouraged to participate changes and allow input from stakeholders. The BOF website publishes information on forth-coming BOF meetings including the “Proposal Book” which details proposed ADFG or stakeholder-requested changes that might lead to regulatory change. Stakeholders are actively encouraged to participate at the meetings and submit proposal prior to the meetings. The OLE and AWT put an emphasis on educating and informing stakeholders of new regulatory changes and other important fishery related matters. **(SC 2.4)**

The Community Development Quota (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. The program involves eligible communities who have formed six regional organizations, referred to as CDQ groups. There are 65 communities within a 50-mile radius of the BS coastline who participate in the program. The CDQ program allocates a percentage of the BSAI quotas to CDQ groups. The program is reviewed every 10 years, with the last review occurring in 2012. Analysis by the State of Alaska in 2013 determined that each CDQ entity had maintained or improved performance against its objectives. The CDQ program provides an example of how the management system takes account of the allocation and use of coastal resources with respect to their economic, social and cultural value **(SC 2.4; 2.5)**.

A considerable amount of monitoring of the coastal environment in Alaska is conducted and supported by multiple federal and state agencies (e.g., NMFS, AFSC, ADFG, universities such as the University of Alaska Fairbanks’ Institute of Marine Science, and organizations that support and facilitate marine research such as the North Pacific Research Board [NPRB]). The NPRB have helped fund two major projects in the Alaska region: The Bering Sea Project and the Gulf of Alaska Ecosystem Study. AFSC has established the Ecosystem Monitoring and Assessment Program with an overall goal to improve and reduce uncertainty in stock assessment models of commercially important fish species through the collection of observations of fish and oceanography **(SC 2.5; 2.6)**.

The ecosystem-based fisheries management (EBFM) approach taken by the Council recognizes the interactions within an ecosystem rather than considering a single species or issue in isolation. The primary purpose of EBFM as viewed by the Alaska Region’s partners and stakeholders is to manage and conserve fish stocks in the context of the ecosystem as a whole. Recent EBFM considerations in the Alaska Region have included a focus on the role of humans in the ecosystem and the importance of maintaining healthy fishing communities. Within the BS Fisheries Ecosystem Plan (FEP) and the AI FEP, the Council has progressed on EBFM, that provides a clear record for the Council’s ecosystem-based policy decision making, while applying policies that are suited to Alaskan circumstances.¹² **(SC 2.5; 2.6)**

The State of Alaska is represented in the Oil Spill Task Force by the Department of Environmental Conservation. Its Division of Spill Prevention and Response prevents spills of oil and hazardous substances, prepares for when a spill occurs and responds rapidly to protect human health and the environment. The Oil Spill Recovery Institute located in PWS conducts research into oil spills and their effects on the Alaskan environment, particularly the natural resources in PWS **(SC 2.7)**.

Evaluation Parameter Rationale - Process	Met? (Yes/No/NA)
<i>2.1 A mechanism exists by which the integrated management of multiple coastal area uses is conducted, the possible uses of coastal resources are assessed, and access to them is governed. Accordingly, policies for the management of the coastal area are set. Assessment teams shall document how existing authorities and/or processes cooperate and interact together to manage coastal resources (living and non-living) in a transparent, organized, and sustainable way that minimizes environmental issues while taking into account the socio-economic aspects, needs, and interests of the various stakeholders of the coastal zone.</i>	Yes
<i>2.1.1 There is a mechanism to allow cooperation between neighboring States to improve coastal resource management.</i>	Yes
<i>2.1.2 There are appropriate technical capacities and financial resources.</i>	Yes
<i>2.2 Describe how fishery-related information is disseminated and how a process is in place to consult with the fishery sector and fishing communities.</i>	Yes
<i>2.3 These practices have been adopted, and there is a process to regulate fishing gear, methods, and vessels so as to avoid risk of conflict. If conflicts arise, there is a process in place to settle conflicts between fishery users and other users.</i>	Yes

¹² <https://www.npfmc.org/fisheries-issues/issues/ebfm/>

2.4 <i>There is a process that allows for fishery-related information to be disseminated.</i>	Yes
2.5 <i>There is a system that allows for socio-economic value assessments and cultural value assessments to be carried out.</i>	Yes
2.6 <i>There is a system that allows research and monitoring of the coastal environment, and multidisciplinary research in support of coastal area management is promoted.</i>	Yes
2.7 <i>There is a system to allow early information sharing (i.e., within appropriate timeframes to avoid negative consequences) between States in case of adverse environmental effects from one State.</i>	Yes
Rationale: As noted in the rationale above, the Council management approach carries out its objectives by considering reasonable adaptive, management measures as described in the MSA and in conformance with the National Standards, the Endangered Species Act, the NEPA, and other applicable law. The Council has a public, transparent process that describes the meeting process, including how to participate, how to get involved in the process and the steps involved to implement regulation from ideas brought to the Council by public testimony or the many advisory bodies. Evidence can be found in FMP amendments, meeting minutes, SAFE documents and in the harvest allocations.	

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No/NA)
2.1 <i>The coastal management framework includes explicit consideration of the fragility of coastal ecosystems, the finite nature of coastal resources, and the needs of coastal communities, and accounts for the rights and customary practices of coastal communities. These policies take due account of risks and uncertainties.</i>	Yes
2.1.1 <i>There are records of cooperation. Examples may include fishery, fishery enhancement, or other agreements or records from international forums.</i>	Yes
2.1.2 <i>It can be determined with confidence that there are appropriate technical capacities and financial resources.</i>	Yes
2.2 <i>There are records of consultations with the fisheries sector and fishing communities. Attempts have been made to create public awareness on the need for protection and management of coastal resources, and those affected by the management process have been made aware of its provision.</i>	Yes
2.3 <i>Describe these practices and their effectiveness within the fishery sector, and between fishers and other coastal users.</i>	Yes
2.4 <i>There is a record of the disseminated information, and is it disseminated effectively, and the basis and purposes of such regulation explained to users.</i>	Yes
2.5 <i>There are socio-economic value assessments and cultural value assessments, both of which are effectively assisting decision making on resource allocation and use.</i>	Yes
2.6 <i>Systems of monitoring and research have taken into account physical, chemical, biological, economic, social, legal, and institutional capabilities to support coastal area management.</i>	Yes
2.7 <i>There are current agreements for or past records of such occurrences. Examples may include oil spills, and aquaculture farm escapes among others.</i>	Yes
<p>Rationale: As noted in the rationale above, there are several records and implemented programs that consider the fisheries in the context of the ecosystem as a whole. This can be seen in the FMPs, Ecosystem Plans, meeting minutes from the Council and BOF and SAFE Reports.</p> <p>The Alaska Division of Oil Spill Prevention and Response lists summaries and situation reports that have the potential to significantly impact human health. Active and historic summaries dating back to 2003 are available through links at the following website: https://dec.alaska.gov/spar/ppr/spill-information/response/. Other adverse environmental occurrences include evaluating the impact of climate change in Alaska and records of these events can be found at the U.S. Fish and Wildlife Service, national Wildlife Refuge, Alaska Region; the US Environmental Protection Agency (EPA) and in the United States National Climate Assessment – Alaska.</p>	

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No)
2.1 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that within the fisheries management organization’s jurisdiction, an appropriate policy within the legal and institutional framework has been adopted in order to achieve sustainable and integrated use of living marine resources. Examples may include coastal management plans or other policy documents, and frameworks for resource/coastal management.</i>	Yes

<p>2.1.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that within the fisheries management organization’s jurisdiction, an appropriate policy within the legal and institutional framework has been adopted in order to achieve sustainable and integrated use of living marine resources. Examples may include reports or data on the or data on the international cooperation/information exchange in these events.</p>	<p>Yes</p>
<p>2.1.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fisheries management organization ensures that the authority or authorities representing the fisheries sector and fishing communities in the coastal management process have the appropriate technical capacities and financial resources. Examples may include reports or data, overall operating staff, and financial resources/budgets available.</p>	<p>Yes</p>
<p>2.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that representatives of the fisheries sector and fishing communities are consulted in the decision-making processes and involved in other activities related to coastal area management planning and development. The public, and others affected, are also kept aware of the need for the protection and management of coastal resources, and are participants in the management process. Examples may include public records of consultation activities and other available documentation published on the internet or distributed at public meetings.</p>	<p>Yes</p>
<p>2.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fisheries practices that avoid conflict among fishers and other users of the coastal area (e.g., fisheries enhancement facilities, tourism, energy) are adopted and fishing is regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear, and fishing methods. Procedures and mechanisms are established at the appropriate administrative level to settle conflicts that arise within the fisheries sector, and between fisheries resource users and other coastal users. Examples may include laws and regulations or other documents.</p>	<p>Yes</p>
<p>2.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States’ fisheries management organizations and sub-regional or regional fisheries management organizations and arrangements give due publicity to conservation and management measures and ensure that laws, regulations and other legal rules governing their implementation are effectively disseminated. The bases and purposes of such measures are explained to users of the resource in order to facilitate their application and thus gain increased support in the implementation of such measures. Examples may include records of such management measures published in the internet or distributed at public meetings.</p>	<p>Yes</p>
<p>2.5 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the economic, social, and cultural value of coastal resources is assessed in order to assist decision decision-making on their allocation and use. Examples may include reports on social, cultural, and economic value of the resource.</p>	<p>Yes</p>
<p>2.6 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is cooperation to support and improve coastal area management, and in accordance with capacities, measures are taken to establish or promote (1) systems for research and monitoring of the coastal environment, and (2) multidisciplinary research of the coastal area using physical, chemical, biological, economic, social, legal, and institutional capabilities. Examples may include reports on the status of the coastal area using the various aspects listed above.</p>	<p>Yes</p>
<p>2.7 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the case of a States’ activities that may have an adverse environmental effect on coastal areas of other States, the State provides timely information and if possible, prior notification to potentially affected States. Examples may include reports or data on the international cooperation in these events.</p>	<p>Yes</p>
<p>Rationale: See rationale above.</p>	

<p>Numerical score:</p>	<p>Starting score - (Number of EPs NOT met x 3) = Overall score</p>	
	<p>10</p>	<p>0</p>

Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)	High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)	Full Conformance
Non-conformance Number (if applicable):	NA

Fundamental Clause 3

Management objectives shall be implemented through management rules and actions formulated in a plan or other framework.

Supporting Clause		Score
3.1	<i>Long-term management objectives shall be translated into a plan or other management document (taking into account uncertainty and imprecision) and be subscribed to by all interested parties.</i>	Yes
3.1.1	<i>There shall be management objectives seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and any fisheries enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.</i>	Yes
3.1.2	<i>There shall be management objectives seeking to avoid, minimize, or mitigate impacts of the unit of certification on the stock under consideration's essential habitats, and on habitats that are highly vulnerable to damage by the unit of certification's fishing gear.</i>	Yes
3.1.3	<i>There shall be management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhancement) on the structure, and function of the ecosystems that are likely to be irreversible or very slowly reversible.</i>	Yes
3.2	<i>Management measures shall provide, inter alia, that:</i>	-
3.2.1	<i>Excess fishing capacity shall be avoided and exploitation of the stocks shall remain economically viable.</i>	Yes
3.2.2	<i>The economic conditions under which fishing industries operate shall promote responsible fisheries.</i>	Yes
3.2.3	<i>The interests of fishers, including those engaged in subsistence, small-scale, and artisanal fisheries shall be taken into account.</i>	Yes
3.2.4	<i>Biodiversity of aquatic ecosystems shall be conserved and ETP species shall be protected. Where relevant, there shall be pertinent objectives, and as necessary, management measures.</i>	Yes

Rationale

The MSA, 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 National Standards for fishery management and the National Standard Guidelines require that: "The fishing mortality rate does not jeopardize the capacity of a stock or stock complex to produce MSY." The National Standards are further interpreted through the National Standard Guidelines, required by the MSA and developed and published by NMFS. The National Standard Guidelines for National Standard 1 require that: "when specifying limits and accountability measures intended to avoid overfishing and achieve sustainable

fisheries, Councils must take an approach that considers uncertainty in scientific information and management control of the fishery. These guidelines describe how to address uncertainty such that there is a low risk that limits are exceeded.” Since 2007, the MSA has required that all FMPs include catch limits and accountability measures that are intended to ensure that overfishing cannot reduce a stock below the level that will produce MSY on a continuing basis (NOAA, 2018; MSA, 2007). The management approach of the Council carries out objectives by considering reasonable, adaptive management measures, as described in the MSA and in conformance with the National Standards, the ESA, the NEPA, and other applicable law (NPFMC, 2020; 2020b). **(SC 3.1)**

The U.S measures for regulating the BSAI and GOA fisheries are found in [50 CFR 600](#) and [50 CFR 679](#). Gear types authorized by the FMP are trawls, hook-and-line, pots, jigs, and other gear as defined in regulations. The fishery is primarily managed by required licenses and/or permits, fishing seasons, annual TACs, closed areas, catch restrictions. Annually, the Council develops harvest specifications based on information from the Groundfish Plan Teams, SSC, AP, the public, and any other relevant information. Harvest specifications include overfishing limit, acceptable biological catch (ABC), total allowable catch (TAC), ABC surplus and ABC reserve. Final harvest specifications are implemented by mid-February each year to replace those in effect for that year and based on new information contained in the latest groundfish SAFE reports. Current harvest specifications can be found at the following link: <https://www.npfmc.org/fisheries-issues/issues/harvest-specs/>.

The fishery management goal, according to the BSAI and GOA FMPs (NPFMC 2020; NPFMC 2020b) is to provide sound conservation of the living marine resources; provide socially and economically viable fisheries for the well-being of fishing communities; minimize human-caused threats to protected species; maintain a healthy marine resource habitat; and incorporate ecosystem-based considerations into management decisions. This management approach recognizes the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management, including protection of the long-term health of the resource and the optimization of yield. This policy will use and improve upon the Council’s existing open and transparent process of public involvement in decision-making.

The following procedure is used to specify TACs for every groundfish stock and stock complex managed by the FMP:

1. Determine the ABC for each managed stock or stock complex. ABCs are recommended by the SSC based on information presented by the Plan Team.
2. Determine a TAC based on biological and socioeconomic information. The TAC must be lower than or equal to the ABC. The TAC may be lower than the ABC if warranted on the basis of bycatch considerations, management uncertainty, or socioeconomic considerations; or if required in order to cause the sum of the TACs to fall within the OY range.
3. Sum TACs for “target species” to assure that the sum is within the optimum yield range specified for the groundfish complex in the FMP. If the sum falls outside this range, the TACs must be adjusted.

When TACs for the groundfish complex are determined by the Council, 15 percent of the sum of the TACs is set aside as a reserve. This reserve is used for: a) correction of operational problems in the fishing fleets, to promote full and efficient use of groundfish resources; b) adjustments of species TACs according to the condition of stocks during the fishing year; and c) apportionments. **(SC 3.2.1; 3.22)**

Within both the BSAI and GOA Groundfish FMPs, there are clear short and long-term objectives that are consistent with achieving the outcomes of conservation of the target stocks, non-target species and the surrounding habitat. The following objectives are directly from the BSAI and GOA Groundfish FMP (NPFMC, 2020; 2020b).

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. [Continue to use the existing optimum yield cap for the GOA 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.*

Avoid Impacts to Seabirds and Marine Mammals:

22. *Continue to cooperate with U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species.*
23. *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.*
24. *Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.*
25. *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:

26. *Review and evaluate efficacy of existing habitat protection measures for managed species.*
27. *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.*
28. *Develop a Marine Protected Area policy in coordination with national and state policies.*
29. *Encourage development of a research program to identify regional baseline habitat information and mapping, subject to funding and staff availability.*
30. *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:

31. *Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.*
32. *Maintain the license limitation program, modified as necessary, and further decrease excess fishing capacity and overcapitalization by eliminating latent licences and extending programs such as community or rights-based management to some or all groundfish fisheries.*
33. *Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of access rights based on performance.*
34. *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:

35. *Continue to incorporate local and traditional knowledge in fishery management.*
36. *Consider ways to enhance collection of local and traditional knowledge from communities, and incorporate such knowledge in fishery management where appropriate.*
37. *Increase Alaska Native participation and consultation in fishery management.*

Improve Data Quality, Monitoring and Enforcement:

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

39. Develop funding mechanisms that achieve equitable costs to the industry for implementation of the North Pacific Groundfish Observer Program.
40. Improve community and regional economic impact costs and benefits through increased data reporting requirements.
41. Increase the quality of monitoring and enforcement data through improved technology.
42. 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.
43. Cooperate with research institutions such as the North Pacific Research Board in identifying research needs to address pressing fishery issues.
44. 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.
- (SC 3.1, 3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.2.4)**

As noted above, the National Standards require an approach that considers uncertainty such that there is low risk that limits are exceeded. The precautionary approach is further highlighted in the management approach for BSAI & GOA groundfish fisheries, stating that “the Council intends to consider and adopt, as appropriate, measures that accelerate the Council’s precautionary, adaptive management approach through community-based or rights-based management, ecosystem-based management principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. All management measures will be based on the best scientific information available. Given this intent, the fishery management goal is to provide sound conservation of the living marine resources; provide socially and economically viable fisheries for the well-being of fishing communities; minimize human-caused threats to protected species; maintain a healthy marine resource habitat; and incorporate ecosystem-based considerations into management decisions.” **(SC 3.1, 3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.2.4)**

Evaluation Parameter Rationale - Process	Met? (Yes/No/NA)
3.1 Management objectives based on the best scientific evidence available (which can include traditional/local knowledge, if verifiable) have been translated into a fishery management plan, are in regulation, or are in another document.	Yes
3.1.1 There is a process that allows for setting specific management objectives in fishery management plans or other relevant regulation (or other appropriate frameworks) for the protection of ETP species.	Yes
3.1.2 There is a mechanism in place by which the essential habitat of the stock under consideration and the potential impacts of the fishery (i.e., employing bottom contact gear) upon them are identified. This or a similar mechanism shall also be in place to identify habitats which are highly vulnerable to fishery activities by the unit of certification. The information provided by these mechanisms shall be used to produce specific management objectives seeking to avoid significant negative impacts on habitats. When identifying highly vulnerable habitats, their value to ETP species shall be also considered, with habitats essential to ETP species being categorized accordingly. Note that this clause shall consider Alaska-specific designation of important and essential fish habitats categorized as such at the state and federal level. Such objectives may be outlines in overarching fisheries legislation, regulations, or management plans.	Yes
3.1.3 There is a process in place by which adverse impacts of the fishery (including any fishery enhancement) on the structure, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible are identified. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored. This process results in setting relative management objectives. Management priority shall be focused primarily towards minimizing and avoiding identified impacts.	Yes
3.2 None – this is a summary clause and is not scored.	N/A
3.2.1 There are management measures in place to limit and/or reduce the total fishing capacity of the unit of certification. These measures shall include specific fishing capacity objective(s), which themselves are based on the best scientific evidence available to understand the level of fishing pressure appropriate to ensure the long-term sustainability	Yes

<i>of the fishery. Please note that assessors should ensure that catches are within limits, and that data from enforcement show an adequate level of compliance with fisheries laws and regulation.</i>	
<i>3.2.2 Where best scientific evidence available determines that it is necessary, there are management measures in place to ensure the economic conditions under which the fishery operates promote responsible fisheries.</i>	Yes
<i>3.2.3 There is a system or process in place that identifies the interests of small-scale fishers, either through stakeholder engagement or social research, in a way, which permits the utilization of the information during the management measure development process.</i>	Yes
<i>3.2.4 There are management measures in place specifically designed to ensure that the biodiversity of aquatic ecosystems are conserved and ETP species are protected. This shall reflect the existence of specific management objectives and measures, which are based on the best scientific evidence available.</i>	Yes

Rationale:

The MSA requires that conservation and fisheries' management measures prevent overfishing while achieving optimal yield (OY) on a continuing basis. NMFS and the Council follow a multi-faceted precautionary approach, including overfishing Limits (OFL), acceptable biological catch (ABC), TAC, and OY to manage the federal Alaska flatfish fisheries, based on targets, limits, and pre-defined harvest control rules (HCRs), as well as overall ecosystem considerations (e.g., the OY limits). The fisheries management system is supported by high level science, and management measures have been generally effective in avoiding overfishing and promoting responsible fishing. Objectives for the BSAI and GOA are set out in the FMPs and include the need to take into account socio-economic considerations. Estimates of ex-vessel value by area, gear, type of vessel, and species, are included in the annual Economic Status SAFE report see: <https://www.fisheries.noaa.gov/tags/north-pacific-groundfish-stock-assessments>), and each stock assessment SAFE also contains extensive economic data.

The GOA and BSAI FMPs describe management measures designed to consider the interests of subsistence, small-scale, and artisanal fisheries. Specific FMP management objectives include: the promotion of sustainable fisheries and communities, the promotion of equitable and efficient use of fishery resources and increase Alaska native consultation. Actions have been taken to minimize the bycatch of halibut and salmon, given its importance for subsistence and artisanal fisheries. The fishery dependence of coastal and western Alaska communities was addressed through the creation of the Community Development Quota (CDQ) programs for the BSAI in the early to mid-1990s and the expansion of those programs into the multispecies CDQ program by 1999.

There are mechanisms developed to identify significant effects on essential fish habitat (EFH) and for identifying habitat areas of particular concern and are considered consistent with achieving management objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. This is further supported by habitat ecosystem indicators considered as part of the SAFE process. There are processes in place – primarily through FMPs, endangered species management plans and Biological Opinions and EISs of the various plans - that allow for direct and indirect impacts that are likely to have significant consequences to be addressed.

There are several processes in place which address actual or potential impacts identified through the monitoring of the groundfish fishery and the ecosystem supporting the fishery. The primary mechanism is the annual SAFE report. There are specific processes through NMFS and U.S. Fish and Wildlife Service (USFWS) to review potential impacts (generally indirect effects through changes in prey availability) on endangered species (through the Endangered Species Act, ESA) and marine mammals (Marine Mammal Protection Act, MMPA).

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No/NA)
<i>3.1 The objectives described by the management plan are consistent with the sustainable use of the resource, and are subscribed to by all relevant fishery stakeholders.</i>	Yes
<i>3.1.1 There are clear objectives in management plans or other relevant regulations (or other appropriate frameworks) seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and fishery enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Such objectives may be outlined in overarching fisheries legislation, regulations, or management plans.</i>	Yes
<i>3.1.2 There is evidence that the objectives described above are in place, and that effective management measures relative to those have been implemented.</i>	Yes

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No/NA)
3.2 <i>None – this is a summary clause and is not scored.</i>	NA
3.2.1 <i>The fishing capacity of the unit of certification is at or below the level of the specific fishing capacity objective(s).</i>	Yes
3.2.2 <i>There is evidence for the general economic value of the resource and its benefit to fishermen. There is enforcement data that supports the occurrence of responsible fishing practices.</i>	Yes
3.2.3 <i>There is evidence that the interests of small-scale fishers are effectively taken into account during the development of management measures, and there is no evidence that small-scale fisheries are adversely impacted by any management measures currently in place.</i>	Yes
3.2.4 <i>The management measures currently in place have been successful in meeting the management objectives. Such objectives may be outlines in overarching fisheries legislation, regulations, or management plans. There is no evidence that the fishery is currently having a significant adverse impact on aquatic ecosystems, and it is not putting any ETP species at risk of extinction.</i>	Yes
<p>Rationale: As noted above, there are clear objectives in the MSA and FMPs. Evidence of these management measures and their overall effectiveness can be seen in SAFE reports, stock assessments, changes to amendments, etc. The 6 stocks considered in the present assessment report are above MSY level both in BSAI and in GOA (See below in the evidence basis EP).</p>	

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No)
3.1 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that scientifically based long-term management objectives consistent with the sustainable use of the resource are translated into a plan or other management document which is subscribed to by all interested parties. Examples may include fishery management plan/framework or legal rules.</i>	Yes
3.1.1 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are management objectives seeking to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Examples may include fishery management plans/framework or legal rules.</i>	Yes
3.1.2 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are management objectives seeking to avoid, minimize, or mitigate impacts of the unit of certification on the stock under consideration’s essential habitats and on habitats that are highly vulnerable to damage by the unit of certification’s fishing gear. Examples may include various regulations, fishery management plans, data, and reports.</i>	Yes
3.1.3 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are management objectives seeking to minimize adverse impacts of the fishery (including any enhancement activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Examples may include fishery management plans, other regulatory documents, or laws.</i>	Yes
3.2 <i>None</i>	NA
3.2.1 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that excess fishing capacity is avoided and exploitation of the stocks remains economically viable. Examples may include fishery reports on harvest recommendation or fleet reports.</i>	Yes
3.2.2 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the economic conditions under which fishing industries operate promote responsible fisheries. Examples may include economic reports or enforcement data.</i>	Yes
3.2.3 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the interests of fishers, including those engaged in subsistence, small-scale, and artisanal fisheries are taken into account. Examples may include dedicated quotas, public meeting records, laws, and regulations.</i>	Yes
3.2.4 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that biodiversity of aquatic ecosystems is conserved and ETP species are protected. Where relevant, there are management objectives, and as necessary, management measures. Examples may include laws and regulations, fisheries management plans, and species status reports.</i>	Yes

Rationale:

FMPs, protected species management plans, and biological opinion reviews are all supported by well-designed data-gathering programs and analyses, widely available through NMFS and Council websites. These are, in relation to the complexity of factors which may affect species dynamics, comprehensive and rigorous in their analysis.

The 12 stocks considered in the present reassessment report are above MSY level both in BSAI and in GOA (Figure 10 and Figure 11).

Bering Sea and Aleutian Islands

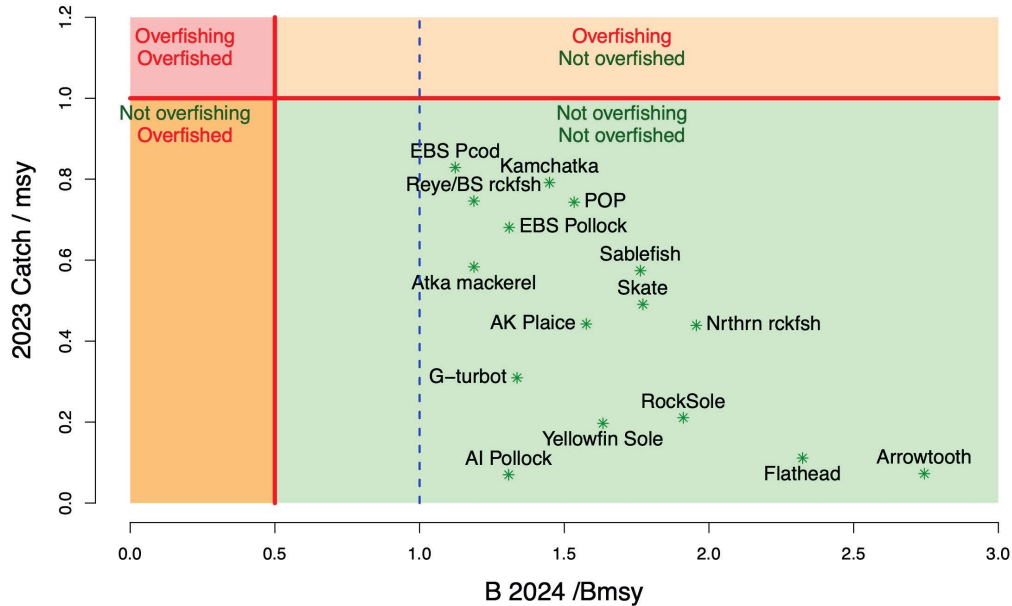


Figure 10 Summary of Bering Sea stock status next year (spawning biomass relative to BMSY; horizontal axis) and current year catch relative to fishing at FMSY (vertical axis) where FOFL is taken to equal FMSY. Source: Aydin et al., 2023.

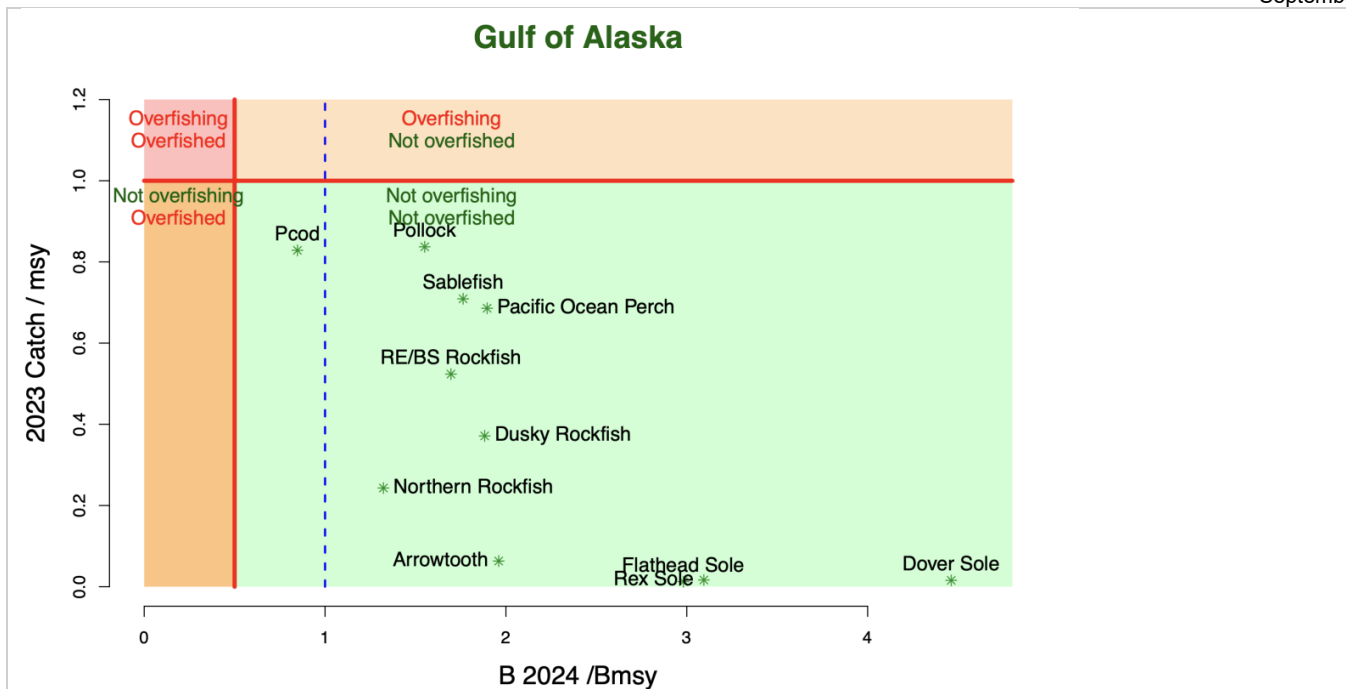


Figure 11 Summary of Gulf of Alaska stock status next year (spawning biomass relative to BMSY; horizontal axis) and current year catch relative to fishing at FMSY (vertical axis). Note that sablefish is for Alaska-wide values including the BSAI catches. Source: Adams et al., 2023

NOAA Fisheries issued the final rule to implement Amendment 123 to the BSAI FMP. This final rule amends the regulations governing limits on Pacific halibut (*Hippoglossus stenolepis*) prohibited species catch (PSC) to link the halibut PSC limit for the Amendment 80 commercial groundfish trawl fleet in the BSAI groundfish fisheries to halibut abundance. This is necessary to comply with the Magnuson Stevens Act (MSA) that FMPs minimize bycatch to the extent practicable. Effective date of the final rule was January 1, 2024.¹³

The Council reviewed the FMP omnibus amendment analysis and proposed FMP amendment text based on the 2023 Essential Fish Habitat (EFH) 5 year Review. The Council took final action and selected Alternative 2, which is summarized as follows:

Alternative 2, the preferred alternative, will update the EFH information in the BSAI & GOA groundfish, BSAI crab and Arctic FMPs. These updates include updated EFH maps, text descriptions, results of the fishing effects (FE) on habitat, prey species tables, non-fishing effects report and research and information needs (NPFMC, 2023).

	Starting score - (Number of EPs NOT met x 3) =		Overall score
	10	0	10
Numerical score:			
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)			Full Conformance
Non-conformance Number (if applicable):			NA

¹³ <https://www.federalregister.gov/documents/2023/11/24/2023-25513/fisheries-of-the-exclusive-economic-zone-off-alaska-bering-sea-and-aleutian-islands-halibut>

Fundamental Clause 4

There shall be effective fishery data (dependent and independent) collection and analysis systems for stock management purposes.

Supporting Clause		Score
4.1	<i>All significant fishery removals and mortality of the target species (shall be considered by management. Specifically, reliable and accurate data required for assessing the status of fishery(ies) and ecosystems—including data on retained catch, bycatch, discards, and waste— shall be collected. Data can include relevant traditional, fisher, or community knowledge, provided their validity can be objectively verified. These data shall be collected, at an appropriate time and level of aggregation, by relevant management organizations connected with the fishery, and provided to relevant States regional, and international fisheries organizations.</i>	Yes
4.1.1	<i>Timely, complete, and reliable statistics shall be compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices, and in sufficient detail to allow sound statistical analysis for stock assessment. Such data shall be updated regularly and verified through an appropriate system. The use of research results as a basis for setting management objectives, reference points, and performance criteria, as well as for ensuring adequate linkage between applied research and fisheries management (e.g., adoption of scientific advice) shall be promoted. Results of analysis shall be distributed accordingly as a contribution to fisheries conservation, management, and development.</i>	Yes
4.1.2	<i>In the absence of specific information on the stock under consideration, generic evidence based on similar stocks can be used. However, the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries.</i>	NA
4.2	<i>An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.</i>	Yes
4.2.1	<i>Where necessary, fisheries management organizations and regional fisheries management organizations and other such arrangements should strive to achieve a level and scope of observer programs sufficient to provide quantitative estimates of total catch, discards, and incidental takes of living aquatic resources.</i>	Yes
4.3	<i>A fisheries management organization, regional fisheries management organizations or arrangements shall compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures.</i>	Yes
4.4	<i>States shall stimulate the research required to support national policies related to fish as food.</i>	Yes
4.5	<i>There shall be sufficient knowledge of the economic, social, marketing, and institutional aspects of fisheries collected through data gathering, analysis, and research, as well as comparable data generated for ongoing monitoring, analysis, and policy formulation.</i>	Yes
4.6	<i>The fisheries management organization shall investigate and document traditional fisheries knowledge and technologies—in particular those applied to small-scale fisheries—in order to assess their application to sustainable fisheries conservation, management, and development.</i>	Yes
4.7	<i>If a fisheries management organization is conducting scientific research activities in waters of another State, it shall ensure that their vessels comply with the laws and regulations of that State and international law.</i>	NA

4.8	<i>Adoption of uniform guidelines governing fisheries research conducted on the high seas shall be promoted and, where appropriate, support the establishment of policies that include, inter alia, facilitating research at the international and sharing the research results with affected States.</i>	NA
4.9	<i>If appropriate, the fisheries management organization and relevant international organizations shall promote and enhance the research capacities of developing countries, inter alia, in the areas of data collection and analysis, information, science and technology, human resource development, and provision of research facilities, in order for them to participate effectively in the conservation, management, and sustainable use of living aquatic resources.</i>	NA
4.10	<i>Competent national organizations shall, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished.</i>	NA
4.11	<i>Relevant technical and financial international organizations shall, upon request, support States in their research efforts, devoting special attention to developing countries—in particular the least developed among them and small developing island countries.</i>	NA

Rationale

Alaska's fisheries targeting flatfish species in the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands (BSAI), have developed advanced systems for fishery-dependent and fishery-independent data collection and analysis. These systems are crucial for managing flatfish stocks such as yellowfin sole, rock sole, and other flatfish species in these regions. The following points outline the key components and effectiveness of these systems in the management of flatfish stocks:

Fishery-Dependent Data Collection (SC 4.1; 4.1.1; 4.2)

Fishery-dependent data is collected directly from commercial fishing operations, providing real-time information on catch, effort, and bycatch. This data is essential for monitoring the impact of fishing on flatfish stocks.

- Catch Reporting Systems: Mandatory catch reporting in the GOA and BSAI requires vessels to provide detailed information on catch composition, location, and fishing effort. Technologies such as electronic monitoring (EM) and vessel monitoring systems (VMS) enhance the accuracy of data collection and track fishing activities in real-time. These data are integrated into stock assessments to estimate catch and removal rates from flatfish populations (AFSC, 2023).
- Observer Program: The North Pacific Groundfish Observer Program (NPGOP) places observers on board fishing vessels to collect detailed biological data, such as species composition, size, age, and bycatch rates. This program is essential for providing accurate data that supports stock assessments and compliance monitoring (NMFS, 2023).

Fishery-Independent Data Collection (SC 4.1; 4.1.1; 4.2)

Fishery-independent surveys provide unbiased estimates of flatfish populations, allowing scientists to assess stock abundance and distribution without the influence of fishing activity.

- Trawl Surveys: The National Marine Fisheries Service (NMFS) conducts regular bottom trawl surveys in the GOA and BSAI. These surveys provide essential data on the abundance and biomass of flatfish species, such as yellowfin sole and rock sole, across a range of depths and habitats. The surveys cover extensive areas, ensuring robust and representative data for stock assessments (e.g.: Siple et al., 2024).
- Acoustic Surveys: Acoustic surveys are used increasingly to estimate fish biomass and distribution, particularly in mixed-species habitats where flatfish coexist with other groundfish species. These surveys offer high-resolution insights into flatfish behavior and spatial patterns, supplementing data from trawl surveys (e.g.: Szuwalski et al., 2023).

Comprehensive Stock Assessments (SC 4.3; 4.4; 4.5; 4.6)

The integration of fishery-dependent and fishery-independent data is fundamental to comprehensive stock assessments that guide management decisions.

- Assessment Models: Advanced stock assessment models, including age-structured and spatially explicit models, are utilized to analyze data from both fishery-dependent and independent sources. These models account for fishing mortality, natural mortality, recruitment, and environmental variables,

providing estimates of current stock status and future projections under various management scenarios (Methot & Wetzel, 2013).

- Harvest Control Rules (HCRs): Fishery management plans (FMPs) in the GOA and BSAI incorporate HCRs based on stock assessment outputs. These rules establish biological reference points, such as maximum sustainable yield (MSY), to prevent overfishing and ensure sustainable exploitation of flatfish stocks. Annual catch limits (ACLs) and total allowable catch (TAC) are set based on these assessments (NPFMC, 2023).

Adaptive Management and Monitoring (SC 4.3; 4.4; 4.5; 4.6)

Alaska's fishery management system is designed to be adaptive, allowing for prompt adjustments based on new scientific data or changes in stock status.

- Annual Stock Reviews: The North Pacific Fishery Management Council (NPFMC) reviews and updates stock assessments annually. This ensures that management decisions are informed by the most current scientific information, with adjustments to TACs and bycatch limits reflecting changes in stock conditions and ecosystem health (NPFMC, 2023).
- Ecosystem-Based Fisheries Management (EBFM): Alaska's management approach incorporates ecosystem considerations, recognizing the importance of maintaining biodiversity and ecosystem function. Data on environmental conditions, predator-prey dynamics, and habitat use are integrated into the management framework, supporting sustainable flatfish fisheries (Zador et al., 2017). These efforts support policies in place such as the MSA and its National Standards.

Stakeholder Involvement and Transparency (SC 4.3; 4.4; 4.5; 4.6)

Stakeholder involvement is a cornerstone of Alaska's fisheries management, ensuring transparency and broad support for management measures.

- Council Process: The NPFMC operates under an open and transparent decision-making process, involving scientists, industry representatives, and conservation groups. This inclusive approach ensures that management decisions are well-informed and supported by a range of stakeholders (Krupa et al., 2018).

Alaska's fisheries management in the GOA and BSAI regions relies on robust data collection systems, comprehensive stock assessments, adaptive management practices, and transparent stakeholder involvement. These elements together ensure the sustainable management of flatfish species, safeguarding their populations for future generations.

- There is also specific traditional knowledge that is used both at the state level of fishery management in Alaska and at the Federal level. The North Pacific Fishery Management Council (NPFMC) has made efforts to incorporate traditional knowledge (TK) into its decision-making process for Alaska fisheries, including: Creating seats for Alaska Native Tribes on advisory bodies and committees
- Adopting a protocol for identifying, analyzing, and incorporating TK

The Council adopted the Local Knowledge (LK), Traditional Knowledge (TK), and Subsistence Protocol (LKTKS Protocol) in October 2023. The LKTKS Protocol provides foundational information and context for identifying, analyzing, and incorporating LK, TK, and subsistence information into the Council's decision-making process. At the core of this work is the recognition of diversity among the people that engage in, depend on, and are impacted by the federal fisheries managed by the Council. Effective fisheries management that supports sustainable fisheries and ecosystems requires robust science and an inclusive decision-making process that fosters relationships and trust¹⁴(NPFMC, 2024).

Since these fisheries are exclusively managed by the U.S., there is no need for cross-jurisdictional stock research, making certain regulatory clauses inapplicable to the management of flatfish in the GOA and BSAI and 4.7 to 4.11 clauses are not applicable. In addition, considering the comprehensive data available for the key flatfish stocks also clause 4.1.2 is considered not applicable.

¹⁴ <https://www.npfmc.org/how-we-work/management-policies/>

Evaluation Parameter Rationale - Process	Met? (Yes/No)
<p>4.1 <i>There is a process or system that allows for effective data collection (including data on retained catch, bycatch, discards and waste) on the status of fisheries and ecosystems for management purposes. In the case of stocks fished by more than one State, this includes a system or agreement with other States to ensure mortality and removals data are available for the entirety of the biological stock. Some fisheries and/or fish stock are hard to monitor for various reasons, including remoteness of operation/distribution and complexity of fishing operations—posing particular challenges with the collection and maintenance of adequate, reliable, and current data and/or other information. Assessors shall acknowledge and explain these challenges, data collection, and maintenance to cover all stages of fishery development in accordance with applicable international standards and practices. For salmon, the assessors shall describe and present the enumeration methods (i.e., peak aerial survey, feet survey, weir count, tower, mark–recapture, sonar, etc.) utilized for all the major stocks managed by formal escapement goal in Alaska. Such summary data can be found in the annually released ADF&G document Summary of Pacific salmon escapement goals in Alaska with a review of escapements from [year] to [year]. The document generally reviews the latest 9–10 years of salmon escapements, enumeration, goal development methods, and the relative escapement goal performance.</i></p>	<p>Yes</p>
<p>4.1.1 <i>There is a process or system that allows for the production, maintenance, update, and verification of statistical data to international standards. Such standards include the FAO Coordinating Working Party on Fishery Statistics Handbook of Fishery Statistical Standards. Also, there is a process for the use and distribution of research results as a basis for setting management objectives, reference points, and performance criteria, as well as for ensuring adequate linkage between applied research and fisheries management (e.g., adoption of scientific advice). Please note that stock assessment for salmon is intended as the processes that leads to enumeration, escapement goal development, and fishery management activities to meet escapement goals.</i></p>	<p>Yes</p>

<p>4.1.2 <i>There is a process that allows for the use of generic evidence based on similar stocks for fisheries with low risk. The greater the risk, the more specific evidence is necessary to assess sustainability. In principle, “generic evidence based on similar stocks” should not suffice, but it may be adequate where there is low risk to the stock under consideration. In general, “low risk to that stock under consideration” would suggest that there is very little chance of the stock becoming overfished (e.g., where the exploitation rate is very low and the resilience of the stock is high). However, the evidence for low risk and the justification for using surrogate data shall come from the stock assessment itself.</i></p>	<p>NA</p>
<p>4.2 <i>An observer program is present. There may be cases where collection of accurate data for research and support compliance could be established without the use of observers or a formal observer scheme (i.e., inspection scheme, enforcement, port sampling, at shore inspection, voluntary or compulsory logbooks, e-logbooks or other harvester collected data, electronic monitoring [video], or bycatch surveys). The reliability and accurateness of that system(s) would need to be verified accordingly. Note also that some fisheries observer programs are designed to collect biological data and others serve mainly as a compliance or enforcement tool. This shall be considered accordingly in the overall evaluation of this clause. Assessors shall question primarily whether the required data for fisheries management are collected or if there are important data gaps (e.g., because of the absence of an observer program).</i></p>	<p>Yes</p>
<p>4.2.1 <i>There is a clear system that allows the observer program, or any other appropriate data gathering system as appropriate, to provide sufficient quantitative estimates of total catch, discards, and incidental takes of living aquatic resources.</i></p>	<p>Yes</p>
<p>4.3 <i>There is a system within the regional body structure that allows for data distribution in line with confidentiality requirements.</i></p>	<p>Yes</p>
<p>4.4 <i>There is research to support policies related to fish as food.</i></p>	<p>Yes</p>
<p>4.5 <i>There is a system in place for collecting economic, social, marketing, and institutional knowledge of the fisheries.</i></p>	<p>Yes</p>
<p>4.6 <i>Traditional fisher knowledge has been investigated. Note that for highly developed fisheries that knowledge may already have been integrated into fisheries management.</i></p>	<p>Yes</p>
<p>4.7 <i>There is a system in place to manage the conduct of research vessels operating in waters of other States.</i></p>	<p>NA</p>
<p>4.8 <i>There is a mechanism in place to allow the development and review of guidelines governing fisheries research conducted on the high seas.</i></p>	<p>NA</p>
<p>4.9 <i>There is a mechanism in place by which the research capacities of developing countries can be developed and enhanced. This could include, but is not limited to, the provision of personnel, equipment, funding, or cooperation on data collection and stock assessment.</i></p>	<p>NA</p>
<p>4.10 <i>There is a mechanism to allow a national organization to render technical and financial support to the State.</i></p>	<p>NA</p>
<p>4.11 <i>The international management component of the fishery is engaged in processes that support the fishery based in developing countries.</i></p>	<p>NA</p>

Rationale:

The fisheries management of flatfish species in the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands (BSAI) regions involves comprehensive processes to monitor removals and mortality, ensuring sustainable harvest levels. Key stocks targeted in these fisheries include BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole. Management strategies include the collection of annual data on retained catch, bycatch, and state-managed fisheries, with the Catch Accounting System (CAS) integrating data from multiple sources, including observer programs, to provide timely and reliable information (NMFS, 2023).

The North Pacific Observer Program is integral to data collection, deploying approximately 500 observers annually who gather high-quality data used for stock assessments and ecosystem research. In 2013, NOAA Fisheries enhanced observer deployment, improving data reliability and expanding coverage to previously unobserved fisheries, thereby enhancing the accuracy of bycatch estimates and overall fishery monitoring (Faunce et al., 2016). Vessels and processors are categorized into full or partial observer coverage based on

size and gear type, with specific data collection requirements for each group, helping tailor data collection efforts to fishery needs (NMFS, 2023).

Amendments to fishery management plans in 2013 established the North Pacific Groundfish and Halibut Observer Program, which collects data on total catch and interactions with protected species to support quota management and bycatch reduction measures. This program operates under regulations specified in 50 CFR part 679 (see: <https://www.federalregister.gov/documents/2024/02/05/2024-01952/fisheries-of-the-exclusive-economic-zone-off-alaska-amendment-126-to-the-fishery-management-plans>), ensuring comprehensive monitoring of the GOA and BSAI flatfish fisheries.

Stock assessments and management decisions for flatfish species are detailed in Stock Assessment and Fishery Evaluation (SAFE) reports, which align management strategies with those used for other groundfish stocks in the Alaska Exclusive Economic Zone (EEZ). Management also incorporates socio-economic data collection in compliance with the Magnuson-Stevens Fishery Conservation and Management Act and the National Environmental Policy Act (NEPA). The Economic SAFE report provides in-depth analyses of economic conditions, including price forecasts and fishery performance metrics, essential for understanding the broader impacts of management decisions (Abelman et al., 2023).

Additionally, Alaska Native consultation remains a key objective in fisheries management, reflecting the need to consider traditional and local knowledge in the decision-making process (NPFMC, 2023).

Since these fisheries are exclusively managed by the U.S., there is no need for cross-jurisdictional stock research, making certain regulatory clauses inapplicable to the management of flatfish in the GOA and BSAI and 4.7 to 4.11 clauses are not applicable. In addition, considering the comprehensive data available for the key flatfish stocks also clause 4.1.2 is considered not applicable.

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No)
<p>4.1 <i>There are appropriate and reliable data collection and estimation methods. Reliable and accurate data are collected on retained catch, bycatch, discards, and waste (for targeted and non-targeted fisheries), and the direct and indirect impacts of the fishery on the ecosystem. Such information is disseminated to all relevant fishery management authorities. Overall, the data collection system is considered effective for the purposes of this clause if fishery scientists believe there is a high probability that the total estimated mortality is an accurate reflection of the actual total mortality across the entire biological stock. Fishery data are collected with a frequency and level of aggregation, which allows the effective and informed management of the stock,. The appropriate level of aggregation will often be the stock level, but could also reflect specific habitats, gear types, sub-populations, etc. The requirements for data collection are focused on the need to assess the effects of the unit of certification on non-target stocks. Non-target catches and discards refer to species/stocks that are taken by the unit of certification other than the stock for which certification is being sought. The adequacy of data relates primarily to the quantity and type of data collected (including sampling coverage) and depends crucially on the nature of the systems being monitored and purposes to which the data are being put. Some analysis of the precision resulting from sampling coverage would normally be part of an assessment of adequacy and reliability. The currency of data is important, inter alia, because its capacity for supporting reliable assessment of current status and trends declines as it gets older.</i></p>	<p>Yes</p>
<p>4.1.1 <i>There is evidence for the production, maintenance, updating, and review of statistical data on catch and fishing effort in the fishery under assessment. There is evidence that the best scientific evidence available is used to inform the fisheries management process.</i></p>	<p>Yes</p>

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No)
<i>Where there is a legal requirement for the advice of scientific authorities to be adopted, this shall be viewed as conformance with this evaluation parameter.</i>	
4.1.2 <i>Information has been utilized from generic evidence based on similar fishery situations. Based on the risk of overfishing, the information utilized is of higher precision to account for higher risks (i.e., intensive fisheries).</i>	NA
4.2 <i>The data collected by the observer program is considered accurate and useful.</i>	Yes
4.2.1 <i>The data collected by the observer program is considered accurate and useful, especially for providing quantitative estimates of total catch, discards, and incidental takes of living aquatic resources.</i>	Yes
4.3 <i>There is evidence proving that confidentiality requirements are satisfied when data is distributed to the various parties.</i>	Yes
4.4 <i>There is evidence of this research.</i>	Yes
4.5 <i>These data are used for ongoing monitoring, analysis, and policy formulation.</i>	Yes
4.6 <i>There are records of the documentation of small-scale fisher practices.</i>	Yes
4.7 <i>If a fisheries management organization is conducting scientific research activities in waters of another State, there is record of such shared research activities and they comply with required regulations.</i>	NA
4.8 <i>There is a record of uniform high seas research guidelines or a mechanism to create them.</i>	NA
4.9 <i>There are recognizable examples of instances in the history of the fishery under assessment where actions by the managers of the unit of certification have promoted or enhanced the research capacity of one or more developing nations in the ways described above.</i>	NA
4.10/4.11 <i>There is a record of the provided technical and financial support.</i>	NA
<p>Rationale:</p> <p>The data collection and catch estimation methods for flatfish fisheries in the BSAI and GOA, including key stocks as BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole, are reliable and well-documented. These fisheries operate under a robust management framework that ensures accurate data on retained catch, bycatch, discards, non-target species, and ecosystem impacts. Relevant management authorities, such as the National Marine Fisheries Service (NMFS) and Alaska Department of Fish and Game (ADFG), have access to this comprehensive data, which supports the annual or biannual stock assessments essential for informed fisheries management (NMFS, 2023).</p> <p>The total mortality estimates generated from these assessments accurately reflect the biological stock mortality, and current Stock Assessment and Fishery Evaluation (SAFE) reports indicate that flatfish stocks in the GOA and BSAI do not have special management needs, as they are fully contained within the U.S. Exclusive Economic Zone (EEZ) around Alaska (NPFMC, 2023).</p> <p>The Catch Accounting System (CAS) plays a crucial role in integrating observer data with industry-reported information, such as data from eLandings, to provide comprehensive estimates of total catch. This includes bycatch data collected by on-board observers and incorporated into annual stock assessments. Subsistence and sport fishing removals are estimated by ADFG, ensuring a full accounting of all sources of fishing mortality. Long-term catch and effort data are maintained and regularly updated to inform stock assessments, with input from NMFS, ADFG, and academic institutions contributing to the best scientific information available for fishery management (NPFMC, 2023).</p> <p>The North Pacific Groundfish and Halibut Observer Program (NPGHOP), which covers approximately 80% of fisheries by volume, provides critical biological data on commercial catch, bycatch, and species interactions. These data are fundamental to both stock assessments and in-season management decisions, including fishery closures when necessary to protect stock health (Faunce et al., 2016). NMFS and ADFG maintain extensive, publicly accessible databases that include this information, with confidentiality maintained for sensitive commercial fishing data (NMFS, 2023).</p> <p>Alaska supports seafood research and industry efforts through organizations such as the Alaska Seafood Marketing Institute and the Kodiak Seafood and Marine Science Center, which help to promote sustainable fisheries and support economic analysis of catch estimates, discard rates, prohibited species catch (PSC), and employment data for vessels and processors. Annual reports provide insights into economic changes, including market factors influencing the North Pacific fisheries (Abelman et al., 2023).</p>	

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No)
<p>Most flatfish catches in Alaskan waters are harvested by large-scale operations, such as catcher-processors or large catcher vessels. Smaller fisheries, including some state-managed ones, are also effectively regulated, accounting for localized fisheries issues and ensuring sustainable practices at all scales. The North Pacific Fishery Management Council (NPFMC) Fishery Management Plans (FMPs) specifically consider objectives to increase Alaska Native consultation. Efforts include incorporating local and traditional knowledge in fishery management, enhancing data collection from communities, and integrating this knowledge where appropriate (Raymond-Yakoubian et al., 2017).</p> <p>These fisheries are fully managed within the jurisdiction of Alaska, reducing the need for shared stock research between different management bodies. As a result, specific clauses regarding inter-jurisdictional management (clauses 4.7 to 4.11) are not applicable to these fisheries. In addition, considering the comprehensive data available for the key flatfish stocks also clause 4.1.2 is considered not applicable.</p>	

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No)
<p>4.1 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that all significant fishery removals and mortality of the target species are considered by the fishery management organizations. Specifically, reliable and accurate data required for assessing the status of fishery/ies and ecosystems—including data on retained catch, bycatch, discards, and waste—are collected. Data can include relevant traditional, fisher, or community knowledge, provided their validity can objectively be verified (i.e., the knowledge has been collected and analyzed through a systematic, objective, and well-designed process, and is not just hearsay). Examples may include stock assessment reports, catch data, and observer data.</i></p>	<p>Yes</p>
<p>4.1.1 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that timely, complete, and reliable statistics are compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices, and in sufficient detail to allow sound statistical analysis for stock assessment. Such data are updated regularly and verified through an appropriate system. The use of research results as a basis for setting management objectives, reference points, and performance criteria, as well as for ensuring adequate linkage between applied research and fisheries management (e.g., adoption of scientific advice) is promoted. Analysis results are distributed accordingly as a contribution to fisheries conservation, management, and development. Examples may include stock assessment reports and other data.</i></p>	<p>Yes</p>
<p>4.1.2 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the absence of specific information on the stock under consideration, generic evidence based on similar stocks can be used for fisheries with low risk to that stock under consideration. However, the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries. Examples may include stock assessment reports and other data.</i></p>	<p>NA</p>
<p>4.2 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that an observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures is established. Examples may include stock assessment, survey, observer, or other reports.</i></p>	<p>Yes</p>
<p>4.2.1 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the observer program is established and able to provide quantitative estimates of total catch, discards, and incidental takes of living aquatic resources. Examples may include stock assessment, observer, survey, or other reports.</i></p>	<p>Yes</p>
<p>4.3 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that a fisheries management organization, regional fisheries management organizations or arrangements compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures. Examples may include reports where confidentiality requirements have been effected.</i></p>	<p>Yes</p>
<p>4.4 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the State stimulates the research required to support policies related to fish as food.</i></p>	<p>Yes</p>
<p>4.5 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is sufficient knowledge of the economic, social, marketing, and institutional aspects of fisheries, that they are adequately researched, and that comparable data are generated for</i></p>	<p>Yes</p>

<p><i>ongoing monitoring, analysis, and policy formulation. Examples may include reports on social/cultural/economic value of the resource.</i></p>	
<p><i>4.6 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fisheries management organization investigates and documents traditional fisheries knowledge and technologies—in particular those applied to small-scale fisheries—in order to assess their application to sustainable fisheries conservation, management, and development. Examples may include various fisheries reports.</i></p>	Yes
<p><i>4.7 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that if a fisheries management organization is conducting scientific research activities in waters of another State, it ensures that their vessels comply with the laws and regulations of that State and international law. Examples may include survey reports.</i></p>	NA
<p><i>4.8 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that adoption of uniform guidelines governing fisheries research conducted on the high seas is promoted and, where appropriate, supports the establishment of mechanisms, including, inter alia, adopting uniform guidelines to facilitate research at the international level, and encouraging such research results be shared with affected States. Examples may include survey reports, or high seas guidelines.</i></p>	NA
<p><i>4.9 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that if appropriate, the fisheries management organization and relevant international organizations promote and enhance the research capacities of developing States, inter alia, in the areas of data collection and analysis, information, science and technology, human resource development, and provision of research facilities, in order for them to participate effectively in the conservation, management, and sustainable use of living aquatic resources. Examples may include various data or reports.</i></p>	NA
<p><i>4.10 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that competent national organizations, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished. Examples may include various data or reports.</i></p>	NA
<p><i>4.11 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that relevant technical and financial international organizations are, upon request, supporting States in their research efforts, and are devoting special attention of developing countries—in particular the least developed among them and small island developing countries. Examples may include various data or reports.</i></p>	NA
<p>Rationale:</p> <p>The data collection and catch estimation processes for flatfish fisheries in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI), such as those targeting key stocks as BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatcka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole, are robust and well-documented. Key references include Cahalan et al. (2014), which provides detailed methodologies for catch estimation, and the most recent Stock Assessment and Fishery Evaluation (SAFE) reports, which include comprehensive stock assessments and commercial catch data for these flatfish species (NMFS, 2023). The Alaska Fisheries Information Network (AKFIN) plays a critical role in maintaining a comprehensive database of commercial fisheries data, which is extensively used by scientists and managers to monitor and evaluate fishery performance (AKFIN, 2023).</p> <p>The North Pacific Observer Program deploys approximately 500 observers annually, contributing over 30,000 observer days, which supply essential data for stock assessments, scientific studies, and management decisions (AFSC, 2023). Observer data is particularly crucial for estimating bycatch, discards, and Discard Mortality Rates (DMRs) in the flatfish fisheries. Detailed DMR calculations and methodologies can be found in reports by the North Pacific Fishery Management Council (NPFMC, 2023). In addition, NMFS and NPFMC have developed an Electronic Monitoring (EM) Strategic Plan to incorporate video technology and enhance data collection efforts, specifically targeting improved bycatch monitoring and species identification (NMFS, 2023).</p> <p>Confidential fish ticket records, managed by the Commercial Fisheries Entry Commission (CFEC), provide essential data for managing Alaska’s fisheries and are preserved for 45 years, with access governed by state laws (CFEC, 2023). Economic data, including assessments of the economic impact of Alaska’s flatfish fisheries, are analyzed in annual SAFE reports and studies such as those by the McDowell Group (2015) and Abelman et al. (2023). Additionally, research and outreach efforts conducted by the Alaska Seafood Marketing Institute (ASMI) and the Kodiak Seafood and Marine Science Center aim to improve industry practices and promote sustainable fishery management (ASMI, 2023; UAF, 2023).</p>	

To enhance communication and involvement of rural communities and Alaska Native entities, the NPFMC has established a Community Engagement Committee. This committee focuses on ensuring these groups have a voice in the fishery management process, promoting inclusive governance (NPFMC, 2023).

Unlike fisheries that span multiple jurisdictions, Alaska’s flatfish fisheries are fully managed within the state, thus negating the need for shared stock research across different management authorities. Consequently, clauses 4.7 to 4.11 regarding cross-jurisdictional research are not applicable. In addition, considering the comprehensive data available for the key flatfish stocks also clause 4.1.2 is considered not applicable.

	Starting score - (Number of EPs NOT met x 3) =		Overall score
	10	0	10
Numerical score:			
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)			Full Conformance
Non-conformance Number (if applicable):			NA

Fundamental Clause 5

There shall be regular stock assessment activities appropriate for the fishery, its range, the species biology, and the ecosystem, undertaken in accordance with acknowledged scientific standards to support its optimum utilization.

Supporting Clause		Score
5.1	<i>An appropriate institutional framework shall be established to determine the applied research required and its proper use (i.e., assess/evaluate stock assessment model/practices) for fishery management purposes.</i>	Yes
5.1.1	<i>Less elaborate stock assessment methods are frequently used for small-scale or low-value capture fisheries resulting in greater uncertainty about the status of the stock under consideration., A more precautionary approach to managing fisheries on such resources shall be required, including, where appropriate, a lower level of resource utilization. A record of good management performance may be considered as supporting evidence of the adequacy of the management system.</i>	NA
5.1.2	<i>The fisheries management organization shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, and fishery enhancement. Analysis results shall be distributed in a timely and readily understandable fashion in order that the best scientific evidence available contributes to fisheries conservation, management, and development. The fisheries management organization shall also ensure the availability of research facilities and provide appropriate training, staffing, and institution building to conduct the research.</i>	Yes
5.2	<i>There shall be established research capacity necessary to assess and monitor (1) the effects of climate or environment change on stocks and aquatic ecosystems, (2) the state of the stock under State jurisdiction, and (3) the impacts of ecosystem changes resulting from fishing activity, pollution, or habitat alteration.</i>	Yes
5.3	<i>Management organizations shall cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.</i>	Yes

5.4	<i>The fishery management organizations shall directly, or in conjunction with other States, develop collaborative technical and research programs to improve understanding of the biology, environment, and status of transboundary shared, straddling, highly migratory and high seas stocks.</i>	NA
5.5	<i>Data generated by research shall be analysed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.</i>	Yes

Rationale

Alaska’s fisheries in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) targeting flatfish species, including key stocks as BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatcka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole, are managed through comprehensive and regular stock assessments tailored to the unique biological and ecological characteristics of these species. These assessments ensure sustainable management of the fisheries by incorporating scientific best practices, ecosystem considerations, and species-specific management measures. Key points supporting the necessity of appropriate stock assessment activities are outlined below:

Institutional framework and data generated by research (5.1 and 5.5)

The institutional framework guiding applied research for fishery management in the Alaska flatfish fishery ensures science-based decision-making, sustainability, and compliance with federal regulations. Key organizations, such as the North Pacific Fishery Management Council (NPFMC), the National Marine Fisheries Service (NMFS), and the Alaska Fisheries Science Center (AFSC), collaborate to assess fish stocks and evaluate management strategies.

The AFSC conducts stock assessments by collecting biological, ecological, and fishery data, which are reviewed by NMFS scientists and regional experts. These assessments inform the NPFMC, which establishes annual catch limits (ACLs) to prevent overfishing and maintain sustainable harvests. The framework also relies on regular peer reviews through the Stock Assessment Review (STAR) panels and the Scientific and Statistical Committee (SSC), ensuring that best practices and models are used.

Through this framework, adaptive management practices are implemented. When new research identifies changes in stock conditions or ecosystem impacts, the stock assessment models are updated accordingly. This collaborative and transparent structure ensures that applied research addresses emerging challenges, providing fisheries managers with the data needed to make effective and sustainable decisions.

Data generated through research in the framework of Alaska’s fisheries in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) targeting flatfish species, are analyzed and disseminated following strict protocols to ensure confidentiality, particularly when proprietary or sensitive information is involved. Research data, including stock assessments, harvest data, and biological sampling, are collected by the AFSC and the NMFS. These institutions follow federal guidelines, such as the Magnuson-Stevens Fishery Conservation and Management Act and NOAA’s Confidentiality of Fisheries Statistics Policy, which protect individual and proprietary business information. When research results are published, only aggregated data are reported to prevent the disclosure of private operational details, such as individual vessel catches or fishing locations. The publications, often in the form of stock assessment reports, scientific papers, and council documents, balance transparency with confidentiality. The NPFMC and its Scientific and Statistical Committee (SSC) review the analyses, ensuring that the results support management decisions while safeguarding sensitive data. This approach maintains stakeholder trust, promotes scientific rigor, and ensures compliance with legal confidentiality requirements.

Scientific Standards for Stock Assessments (SC 5.1, 5.1.2, 5.2, 5.3, 5.5)

Stock assessments for flatfish in the GOA and BSAI are conducted following internationally recognized scientific standards, including those set by the Food and Agriculture Organization (FAO) and other leading fisheries management bodies. The assessments employ best practices, such as systematic data collection, advanced model-based analyses, and independent peer reviews, ensuring that the scientific outputs are reliable and aligned with international benchmarks (Methot & Wetzels, 2013).

- Use of Age-Structured and Biomass Dynamics Models: Stock assessments for flatfish species such as Alaska plaice, flathead sole, and rock sole typically utilize age-structured and biomass dynamics models. These models integrate fishery-independent survey data and fishery-dependent catch data, accounting for key biological parameters, including growth rates, natural mortality, recruitment, and spawning

biomass. This modeling approach is crucial for reflecting the life history traits of these species, enhancing the accuracy and relevance of stock assessments (Iannelli et al., 2012).

- Annual or Biennial Assessments: Stock assessments are conducted annually or biennially, depending on the specific flatfish species and fishery requirements. For example, yellowfin sole assessments are conducted annually due to their higher susceptibility to fishing pressure, while flathead sole and rock sole assessments may be conducted biennially. This assessment frequency is consistent with the species' biological characteristics and their responses to environmental variability and fishing impacts (NPFMC, 2023).

Ecosystem Considerations in Stock Assessments (SC 5.1, 5.1.2, 5.2, 5.3, 5.5)

Alaska's fisheries management adopts an ecosystem-based approach, recognizing the interconnected nature of marine species, habitats, and environmental conditions.

- Ecosystem-Based Fisheries Management (EBFM): The stock assessment process for flatfish integrates ecosystem considerations, such as predator-prey relationships, environmental factors like ocean temperature and bottom habitat conditions, and bycatch impacts. This holistic approach ensures that assessments account for broader ecological dynamics, beyond the target species alone, supporting sustainable fishery management (Punt et al., 2016).
- Multispecies and Ecosystem Models: In addition to single-species assessments, multispecies models and ecosystem indicators are utilized to evaluate the interactions between flatfish and other species within the GOA and BSAI ecosystems. These tools provide insights into the cumulative impacts of fishing on biodiversity and ecosystem functioning, supporting more integrated management strategies (Amar et al., 2018).

Geographic Range and Stock Boundaries (SC 5.1, 5.1.2, 5.2, 5.3, 5.5)

The geographic range of the target flatfish species is well-defined, and stock assessments are specifically tailored to their distribution within Alaska's Exclusive Economic Zone (EEZ).

- Spatial Resolution in Surveys: Fishery surveys and data collection efforts, such as the NOAA bottom trawl surveys, are designed to cover the full geographic range of key flatfish species in the GOA and BSAI. These surveys capture spatial structure, localized population dynamics, and environmental variability, providing comprehensive data for stock assessments (Stauffer, 2004).
- Jurisdiction and Management Boundaries: The stock boundaries for these species are contained within the Alaska EEZ, simplifying management and assessment processes by avoiding cross-jurisdictional complexities. This defined management area enhances the focus on sustainable utilization of flatfish stocks within the region (e.g.: Spies et al., 2020).

Transparency and Peer Review (SC 5.1, 5.1.2, 5.2, 5.3, 5.5)

The Alaska stock assessment process is transparent and subject to rigorous peer review by both national and international scientific bodies. The Stock Assessment and Fishery Evaluation (SAFE) reports, published annually by the North Pacific Fishery Management Council (NPFMC), provide detailed findings on stock status, management recommendations, and the results of scientific peer reviews. These assessments are reviewed by scientists from NMFS, ADFG, and various academic institutions, ensuring that they reflect the best available science and adhere to recognized standards (NPFMC, 2023).

Integration into Fisheries Management (SC 5.1, 5.1.2, 5.2, 5.3, 5.5)

The stock assessment process is integrated into the broader fisheries management framework of the NPFMC, which regularly reviews assessment outcomes in open public forums. This approach allows for stakeholder engagement, transparency, and the incorporation of new scientific insights into management decisions, ensuring that fishery policies are adaptive and responsive to evolving scientific understanding.

The rigorous stock assessment activities for flatfish fisheries in the GOA and BSAI support sustainable management, balancing species-specific biological characteristics with broader ecosystem needs. This combination of reliable data, comprehensive peer review, and ecosystem-based management provides a robust foundation for the long-term health and productivity of Alaska's flatfish fisheries. Therefore, clause 5.1.1 is not applicable. In addition the stocks are not considered shared and 5.4 is not applicable.

Evaluation Parameter Rationale - Process	Met? (Yes/No)
5.1 <i>There is an established institutional framework for fishery management purposes that determines applied research needs and use.</i>	Yes
5.1.1 <i>There is a process that allows more precautionary approaches to managing fisheries (e.g., lower exploitation rates) on resources assessed through stock assessment methods that result in greater uncertainty about the state of the stock under consideration.</i>	Yes
5.1.2 <i>There are organizations and processes in place to permit research into the aspects of fisheries listed in the clause.</i>	Yes
5.2 <i>There is a system that establishes the required research capacity needed to assess and monitor (1) the effects of climate or other environmental change on stocks and aquatic ecosystems; (2) the status of the stock under State jurisdiction; and (3) the impacts of ecosystem changes resulting from fishing activity, pollution, or habitat alteration. Please note that climate science is complex and evolving, and the system shall recognize the ability to assess and monitor these parameters over time.</i>	Yes
5.3 <i>There is cooperation or interaction between international organizations to ensure optimum utilization of resources.</i>	Yes
5.4 <i>The collaborative technical and research programs to improve understanding of the biology, environment, and status of transboundary aquatic stocks have been developed.</i>	NA
5.5 <i>There is a process that allows analysis of research data, ensuring, where appropriate, their confidentiality.</i>	Yes

Rationale:

The National Marine Fisheries Service (NMFS), under the guidance of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), operates an extensive research and management framework through the Alaska Fisheries Science Center (AFSC) in Seattle. This framework supports the sustainable management of flatfish fisheries in the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands (BSAI). Key research is conducted through various divisions and laboratories, such as Auke Bay Laboratories, which focus on fish stock assessments, habitat studies, and marine chemistry.

The Fisheries Monitoring and Analysis Division (FMA) plays a crucial role in monitoring flatfish fisheries by observing commercial catches and bycatch, providing essential data for management. The Resource Assessment and Conservation Engineering Division (RACE) conducts systematic surveys on flatfish species, including key stocks as BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole, which are critical to understanding stock status and ecosystem impacts. Additionally, the Resource Ecology and Fisheries Management Division (REFM) manages comprehensive data analyses on flatfish species and contributes to producing the annual Stock Assessment and Fishery Evaluation (SAFE) report, which outlines the economic and ecological status of these fisheries (NMFS, 2023).

The Alaska Department of Fish and Game (ADFG) complements NMFS research with state-level assessments, focusing on stock health and fishery impacts. Research on flatfish species, such as those mentioned, is a collaborative effort involving NMFS, ADFG, the University of Alaska, and other research institutions, often with input from the fishing industry. These collaborations ensure that research priorities reflect both biological needs and industry concerns, as outlined annually in the SAFE reports (NPFMC, 2023).

Long-term monitoring programs led by NMFS, ADFG, and academic partners investigate the health of flatfish stocks, impacts of fishing, habitat changes, and the effects of climate change. Studies also explore broader ecosystem impacts, recognizing the interconnectedness of flatfish species with other marine organisms and environmental factors (AFSC, 2021). These efforts are essential for adaptive management in response to changing ocean conditions and other stressors.

International collaboration also plays a role, despite the fisheries being primarily within U.S. waters. The U.S. cooperates with organizations such as the International Council for the Exploration of the Sea (ICES) and the North Pacific Marine Science Organization (PICES) to share research findings and align management practices to ensure sustainable fisheries management globally.

The public management process, coordinated by the North Pacific Fishery Management Council (NPFMC), NMFS, and ADFG, ensures transparency and stakeholder involvement in reviewing research findings and fishery data. Confidentiality of sensitive data is maintained as needed to protect industry and research interests, while still allowing for comprehensive analysis and public input (NPFMC, 2023).

The rigorous stock assessment activities for flatfish fisheries in the GOA and BSAI support sustainable management, balancing species-specific biological characteristics with broader ecosystem needs. This combination of reliable data, comprehensive peer review, and ecosystem-based management provides a robust

foundation for the long-term health and productivity of Alaska’s flatfish fisheries. Therefore, clause 5.1.1 is not applicable. In addition the stocks are not considered shared and 5.4 is not applicable.

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No)
<i>5.1 There is evidence to substantiate that essential research for fishery management purposes is determined and carried out. This research generally includes routine stock(s) and ecosystem assessment reports. Assessors shall evaluate the specific stock assessment model/practices for each of the species under assessment and verify the technical appropriateness for use. For salmon, the assessors shall present and evaluate the methods for escapement goal development utilized to develop the annual escapement goals in Alaska (about 300). Statewide summary data for Alaska can be found in the annually released ADF&G document Summary of Pacific salmon escapement goals in Alaska with a review of escapements from [year] to [year]. The document generally presents the latest 9–10 years of salmon escapement performance in review.</i>	Yes
<i>5.1.1 There is evidence that precautionary approaches are applied to managing fisheries (e.g., lower exploitation rates) on resources assessed through stock assessment methods that result in greater uncertainty about the state of the stock under consideration.</i>	Yes
<i>5.1.2 Research is conducted into the following aspects of the fisheries: biology, ecology, technology, environmental science, economics, and aquaculture. The described types of research carried out shall result in the fishery being deemed compliant with this evaluation parameter.</i>	Yes
<i>5.2 There is evidence to demonstrate that there is sufficient research capacity in place to assess and monitor (1) the effects of climate or other environmental change on stocks and aquatic ecosystems, (2) the status of the stock under consideration, and (2) the impacts of fishing activity, pollution, or habitat alteration.</i>	Yes
<i>5.3 There is evidence available to substantiate that such cooperation or interaction has taken place. There is data available that substantiates cooperation activities.</i>	Yes
<i>5.4 There is evidence available to substantiate that such cooperation or interaction has taken place. There are data on collaborative programs to improve understanding of transboundary, shared, straddling, highly migratory or high seas stocks.</i>	NA
<i>5.5 There is evidence data was properly analyzed. Data was published respecting, where appropriate, confidentiality agreements. The rules of confidentiality are effectively respected.</i>	Yes

Rationale:

Stock assessments for flatfish species in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI), such as BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole, are conducted annually or biennially to establish the scientific basis for setting catch quotas. These assessments evaluate stock status relative to biological reference points, incorporate uncertainties, and include data on historical catch trends, maximum sustainable yield (MSY), stock conditions, ecosystem impacts, and potential alternative harvest strategies. The assessments undergo peer review and are compiled in the Stock Assessment and Fishery Evaluation (SAFE) reports, which provide comprehensive data to the North Pacific Fishery Management Council (NPFMC) for harvest decisions (NPFMC, 2023).

Biological research, fishery-independent surveys, and socio-economic data collection conducted by the National Marine Fisheries Service (NMFS), Alaska Department of Fish and Game (ADFG), and other agencies inform these stock assessments. Annual economic status reports also evaluate the socio-economic impacts of these fisheries. SAFE documents outline data gaps and research priorities, which guide ongoing improvements in stock assessments (NMFS, 2023).

The NPFMC receives detailed reports on Alaska’s marine ecosystems, covering environmental and ecosystem variables, which are essential for identifying critical fish habitats. Scientific research, including work by the North Pacific Research Board (NPRB) and the North Pacific Marine Science Organization (PICES), enhances understanding of environmental impacts on flatfish stocks, including the effects of climate change and oceanographic changes in the North Pacific (Shotwell et al., 2021; PICES, 2022).

Collaborative efforts, such as those by the Joint Groundfish Fisheries Research Program and international working groups, focus on data sharing and addressing research gaps for groundfish stocks. Data from these studies are disseminated through peer-reviewed publications, scientific meetings, and publicly available databases, ensuring transparency and timely contributions to the sustainable management of flatfish resources. Confidentiality is maintained where required by law to protect sensitive information.

The rigorous stock assessment activities for flatfish fisheries in the GOA and BSAI support sustainable management, balancing species-specific biological characteristics with broader ecosystem needs. This combination of reliable data, comprehensive peer review, and ecosystem-based management provides a robust foundation for the long-term health and productivity of Alaska’s flatfish fisheries. Therefore, clause 5.1.1 is not applicable. In addition the stocks are not considered shared and 5.4 is not applicable.

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No)
<i>5.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that an appropriate institutional framework is established to determine the applied research required and its proper use (i.e., assess and evaluate stock assessment models or practices) for fishery management purposes. Examples may include description of the overall process of research assessment and peer review, as well as stock and ecosystem assessment reports.</i>	Yes
<i>5.1.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that with less elaborate stock assessment methods frequently used for small-scale or low-value capture fisheries, more precautionary approaches to managing fisheries on such resources are required, including where appropriate, lower level of resource utilization. Examples may include stock assessment reports and other data.</i>	Yes
<i>5.1.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States are conducting appropriate research into the following aspects of the fisheries: biology, ecology, technology, environmental science, economics, and aquaculture. The research is disseminated accordingly. States also ensure the availability of research facilities and provide appropriate training, staffing, and institution building to conduct the research. Examples may include stock assessment, economic value, fleet reports, and other reports.</i>	Yes
<i>5.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is established research capacity necessary to assess and monitor (1) the effects of climate or other environmental change on stocks and aquatic ecosystems, (2) the status of the stock under State jurisdiction, and (3) the impacts of ecosystem changes resulting from fishing activity, pollution, or habitat alteration. Examples may include stock, ecosystem, and habitat assessment reports.</i>	Yes
<i>5.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that management organizations cooperate with relevant international organizations to encourage</i>	Yes

<p><i>research in order to ensure optimum utilization of fishery resources. Examples may include outputs resulting from meetings or other research.</i></p>	
<p><i>5.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organizations directly, or in conjunction with other States, have developed collaborative technical and research programs to improve understanding of the biology, environment, and status, of transboundary, shared, straddling, highly migratory or high seas stocks. Examples may include outputs resulting from meetings or other research.</i></p>	NA
<p><i>5.5 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that data generated by research is analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate. Examples may include various data or reports.</i></p>	Yes
<p>Rationale:</p> <p>The NMFS Alaska Fisheries Science Center (AFSC) provides detailed information on stock assessments and research for Alaskan flatfish species targeted in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI), including key stocks as BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatcka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole. The Stock Assessment and Fishery Evaluation (SAFE) reports, compiled annually by NMFS, ADFG, and universities under the oversight of the North Pacific Fishery Management Council (NPFMC), offer comprehensive reviews of these stocks. These reports, which include assessments on stock status, ecosystem considerations, and economic analyses, are peer-reviewed and represent the best available science for fishery management under the Magnuson-Stevens Act (NMFS, 2023).</p> <p>Research on these flatfish fisheries is extensive and includes annual or biennial bottom trawl surveys in the BSAI, and GOA. These surveys provide critical indices of abundance, size, and age composition, contributing to the ecosystem-based management of these flatfish stocks (von Szalay et al., 2023). Major research initiatives like the Bering Sea Integrated Ecosystem Research Program and the Gulf of Alaska Project, funded by the North Pacific Research Board (NPRB), focus on understanding ecosystem dynamics, climate impacts, and recruitment processes affecting flatfish and other groundfish species (NPRB, 2023).</p> <p>Economic and social data are integrated into the stock assessments to evaluate the performance of flatfish fisheries, with detailed reports provided by the AFSC’s Economic and Social Sciences Research Program. These reports track catch values, bycatch rates, market conditions, and the economic impacts of fishery management decisions, offering insights into the socio-economic performance of the flatfish fisheries (Abelman et al., 2023).</p> <p>Annual ecosystem status reports, such as those compiled by Ferriss et al. (2023), provide the NPFMC with data on environmental trends, predator-prey interactions, and ecosystem health, which are crucial for making informed management decisions. Essential Fish Habitat (EFH) for flatfish species is also identified and managed under NPFMC’s ecosystem-based approach to fisheries management, incorporating habitat suitability models and environmental variables (NPFMC, 2023).</p> <p>International collaboration with organizations like PICES and the International Council for the Exploration of the Sea (ICES), along with national programs such as NOAA’s Essential Fish Habitat initiative, ensures comprehensive data sharing and enhances the global understanding of flatfish stock dynamics (PICES, 2022). The University of Alaska also plays a critical role in fisheries research and education, offering specialized programs and conducting research on marine ecosystems and fisheries science relevant to the flatfish fisheries (UAF, 2023).</p> <p>The rigorous stock assessment activities for flatfish fisheries in the GOA and BSAI support sustainable management, balancing species-specific biological characteristics with broader ecosystem needs. This combination of reliable data, comprehensive peer review, and ecosystem-based management provides a robust foundation for the long-term health and productivity of Alaska’s flatfish fisheries. Therefore, clause 5.1.1 is not applicable. In addition the stocks are not considered shared and 5.4 is not applicable.</p>	

Numerical score:	Starting score - (Number of EPs NOT met x 3) =		Overall score
	10	0	10
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High

Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)	Full Conformance
Non-conformance Number (if applicable):	NA

Fundamental Clause 6

The current state of the stock shall be defined in relation to reference points, relevant proxies, or verifiable substitutes that allow effective management objectives and targets to be set. Remedial actions shall be available and taken where reference points or other suitable proxies are approached or exceeded.

Supporting Clause		Score
6.1	<i>The fishery management organization shall establish safe target reference point(s) for management. Management targets are consistent with achieving maximum sustainable yield (MSY), a suitable proxy, or a lesser fishing mortality—if that is optimal in the circumstances of the fishery (e.g., multispecies fisheries) or is needed to avoid severe adverse impacts on dependent predators.</i>	Yes
6.2	<i>The fishery management organization shall establish appropriate limit reference point(s) for exploitation (i.e., consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible; Appendix 1, Part 1). When a limit reference point is approached, measures shall be taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions should be taken to decrease the fishing mortality (or its proxy) below that limit reference point.</i>	Yes
6.3	<i>Data and assessment procedures that measure the position of the fishery in relation to the reference points shall be established. Accordingly, the stock under consideration shall not be overfished (i.e., above limit reference point or proxy) and the level of fishing permitted shall be commensurate with the current state of the fishery resources, maintaining its future availability, and taking into account that long-term changes in productivity can occur due to natural variability and/or impacts other than fishing (Appendix 1, Part 1).</i>	Yes
6.4	<i>Management actions shall be agreed to in the eventuality that data sources and analyses indicate that these reference points have been exceeded. Accordingly, contingency plans shall be agreed in advance to allow an appropriate management response to serious threats to the resource as a result of overfishing, adverse environmental changes, or other phenomena that may have adverse impacts on the fishery resource (Appendix 1, Part 2). Such measures may be temporary and shall be based on best scientific evidence available.</i>	Yes
6.5	<i>Measures shall be introduced to identify and protect depleted stocks and those stocks threatened with depletion, and to facilitate the sustained recovery/restoration of such stocks. Also, efforts shall be made to ensure that resources and habitats critical to the well-being of such stocks, which have received adverse impacts by fishing or other human activities, are restored.</i>	Yes

Rationale

Current state of the stock and remedial actions (SC 6.1, 6.2, 6.3, 6.4, 6.5)

The status of fish stocks in the Alaska fisheries targeting flatfish in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) is determined using two primary metrics. The first metric is the comparison between the actual exploitation rate and the overfishing level (OFL). A stock is considered to be subject to overfishing if the exploitation rate (fishing mortality) exceeds the fishing mortality rate associated with the OFL (FOFL). The second

metric is the relationship between the current stock biomass and the minimum stock size threshold (MSST). A stock is classified as overfished if its biomass falls below the MSST. A stock is considered to be approaching an overfished condition if there is more than a 50% probability that the stock biomass will drop below the MSST within two years (NPFMC, 2023).

Annual harvest specifications for each stock are determined by the North Pacific Fishery Management Council (NPFMC) and include the OFL, acceptable biological catch (ABC), and total allowable catch (TAC). Stocks in the GOA and BSAI are managed under a tier system (Tiers 1-6), which determines the maximum permissible ABC and OFL for each stock or species group based on data availability and scientific uncertainty. The NPFMC management plans for GOA and BSAI flatfish include harvest control rules (HCRs) that specify reference points to maintain sustainable fisheries, with the main objectives being to prevent overfishing and optimize yield while considering levels of uncertainty (Witherell et al., 2012).

Flatfish species such as BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatcka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole are managed under these tier systems. Most commercially important flatfish stocks fall into Tier 3, few in Tier 2, where sufficient information is available to establish target biomass levels that would be achieved at equilibrium with historical average recruitment under specified control rules. Tier 3 includes stocks with reliable data to estimate proxies for maximum sustainable yield (MSY)-based reference points, although direct estimation of MSY may be uncertain due to variability in spawner-recruit relationships (NPFMC, 2023).

In Tier 3, the FX% metric refers to the fishing mortality rate (F) that corresponds to an equilibrium level of spawning per recruit equal to X% of the level in the absence of fishing. For example, B40% is the long-term average biomass expected under average recruitment and fishing at F40%. Tier 3 stocks have specific targets such as B40% for biomass and F40% for fishing mortality. When stock biomass falls below B40%, fishing mortality is reduced to prevent further declines (NPFMC, 2023). The MSY proxy for Tier 3 is B35%, and the MSST is defined as one-half of B35%, indicating critical thresholds for management actions.

Tier 1 Information available: reliable point estimates of B and B_{MSY} and reliable pdf of F_{MSY} .

1a) Stock status: $B/B_{MSY} > 1$

$F_{OFL} = mA$, the arithmetic mean of the pdf

1b) Stock status: $\alpha < B/B_{MSY} \leq 1$

$F_{OFL} = mA \times (B/B_{MSY} - \alpha)/(1 - \alpha)$

1c) Stock status: $B/B_{MSY} \leq \alpha$

$F_{OFL} = 0$

Tier 2 Information available: reliable point estimates of B , B_{MSY} , F_{MSY} , $F_{35\%}$, and $F_{40\%}$.

2a) Stock status: $B/B_{MSY} > 1$

$F_{OFL} = F_{MSY}$

2b) Stock status: $\alpha < B/B_{MSY} \leq 1$

$F_{OFL} = F_{MSY} \times (B/B_{MSY} - \alpha)/(1 - \alpha)$

2c) Stock status: $B/B_{MSY} \leq \alpha$

$F_{OFL} = 0$

Tier 3 Information available: reliable point estimates of B , $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.

3a) Stock status: $B/B_{40\%} > 1$

$F_{OFL} = F_{35\%}$

3b) Stock status: $\alpha < B/B_{40\%} \leq 1$

$F_{OFL} = F_{35\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$

3c) Stock status: $B/B_{40\%} \leq \alpha$

$F_{OFL} = 0$

Tier 4 Information available: reliable point estimates of B , $F_{35\%}$, and $F_{40\%}$.

$F_{OFL} = F_{35\%}$

Tier 5 Information available: reliable point estimates of B and natural mortality rate M .

$F_{OFL} = M$

Tier 6 Information available: reliable catch history from 1978 through 1995.

OFL = the average catch from 1978 through 1995, unless an alternative value is established by the SSC on the basis of the best available scientific information

The above text table, taken from the NPFMC FMP for BSAI Groundfish, shows the tier system and harvest control rules used to determine FOFL. A similar table exists for FABC calculation in the FMP, and the portion relevant to Tier 3 stocks is as follows:

Tier 3 Information available: reliable point estimates of B , $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.

3a) Stock status: $B/B_{40\%} > 1$

$$\max F_{ABC} = F_{40\%}$$

3b) Stock status: $\alpha < B/B_{40\%} \leq 1$

$$\max F_{ABC} = F_{40\%} \times (B/B_{40\%} - \alpha) / (1 - \alpha)$$

3c) Stock status: $B/B_{40\%} \leq \alpha$

$$\max F_{ABC} = 0$$

Evaluation Parameter Rationale - Process	Met? (Yes/No)
6.1 A target reference point(s) or proxy has been officially established. Managers shall be able to apply technical measures to reduce fishing pressure in the event that reference points are approached or exceeded.	Yes
6.2 A scientifically based limit reference point or proxy has been officially established, and together with the measure to be taken, ensures the reference point(s) will not be exceeded.	Yes
6.3 Data and assessment procedures (i.e., stock assessment process) are in place to measure the position of the fishery in relation to the target and limit reference points.	Yes
6.4 There is an agreed process, system, or contingency plan in the eventuality that the data sources and analyses indicate that these reference points have been exceeded—detailing the appropriate management response to serious threats to the resource because of overfishing, adverse environmental changes, or other phenomena that may have adverse impacts on the fishery resource. Accordingly, the contingency plan/harvest control rule shall be agreed in advance to allow an appropriate management response to serious threats to the resource because of overfishing, adverse environmental changes, or other phenomena that may have adverse impacts on the fishery resource.	Yes
6.5 There is a process that identifies depleted stocks, resources, and habitats. A depleted stock is usually a stock, which has been overfished, the stock status is below limit reference point, and the ability of the stock to recover has been impaired.	Yes
<p>Rationale:</p> <p>National Standard 1 of the Magnuson-Stevens Act (MSA) mandates conservation and fisheries management measures that prevent overfishing while achieving optimal yield in U.S. fisheries, including those targeting flatfish species in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI). Target reference points for biomass and fishing mortality are established for flatfish stocks such as BSAI Alaska plaice, BSAI/GOA Arrowtooth flounder, BSAI/GOA Flathead Sole, BSAI Greenland turbot, BSAI Kamchatka flounder, BSAI/GOA Northern rock sole, GOA Rex sole, GOA Southern rock sole and BSAI Yellowfin sole, utilizing a precautionary approach grounded in rigorous scientific assessments (Adams et al., 2023; Aydin et al., 2023;).</p> <p>Optimal yield reference points are set for the combined flatfish yields across the GOA and BSAI regions, accounting for ecosystem considerations and interspecies interactions (Zador et al., 2022). When fishing mortality exceeds the FOFL (Fishing Overfishing Limit) or stock biomass drops below the MSST (Minimum Stock Size Threshold), the stock is classified as overfished, necessitating the implementation of a rebuilding plan (NOAA, 2023).</p> <p>The National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (NPFMC) conduct comprehensive, peer-reviewed stock assessments to track flatfish stocks relative to these target and limit reference points. Harvest Control Rules (HCRs) specify management responses, such as reducing catch limits or implementing area closures, when these reference points are breached, ensuring the long-term sustainability of the fishery (Hulson et al., 2021).</p> <p>Furthermore, extensive oceanographic monitoring and ecosystem modeling are integral to understanding stock productivity and supporting future projections for these fisheries (Ferriss et al., 2023). These models incorporate environmental variables and predator-prey dynamics, enhancing the accuracy of stock assessments and management decisions.</p>	

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No)
<p>6.1 The official target reference point or proxy is consistent with achieving maximum sustainable yield (MSY), a suitable proxy, or a lesser fishing mortality—if that is optimal in the circumstances of the fishery (e.g., multispecies fisheries) or is needed to avoid severe adverse impacts on dependent predators (e.g. recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored. Furthermore, there is evidence that the target reference point/management target has been used as an objective by the management process. If there are historical instances of the reference point being approached or exceeded, managers have taken remedial action as appropriate. In the context of reference points, when data are insufficient to estimate reference points directly, other measures of productive capacity can serve as reasonable substitutes or proxies. Suitable proxies may include, for example, standardized Catch per Unit of Effort (CPUE) as a proxy for biomass; or specific levels of fishing mortality and biomass, which have proven useful in other fisheries, can be used with a reasonable degree of confidence in the absence of better defined levels. It is important to note that the use of a proxy may involve additional uncertainty, and if so, should trigger extra precaution in setting biological reference points. For salmon, escapement goals are the equivalent of a target reference point proxy.</p>	<p>Yes</p>
<p>6.2 The stock under assessment shall not currently be overfished (see glossary) according to the best scientific evidence available. The stock is currently estimated to be on the sustainable side of this reference point (e.g., spawning stock biomass is above the limit reference point, F is below F_{lim}, etc.). F_{lim} shall not exceed F_{msy}. The limit reference point or proxy is consistent with avoiding recruitment overfishing and other severe negative impacts on the stock. There are mechanisms in place (e.g., harvest control rule or mechanism) to ensure that the level of fishing pressure is reduced if the limit reference point is approached or reached, and these mechanisms are consistent with ensuring to a high degree of certainty that the limit reference point will not be exceeded, and that actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. The level of B_{lim} should be set on the basis of historical information, applying an appropriate level of precaution according to the reliability of that information. In addition, an upper limit should be set on fishing mortality, F_{lim}, which is the fishing mortality rate that, if sustained, would drive biomass down to the B_{lim} level. It is important to clarify that for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance over a 4- to 5-year period shall be considered a suitable minimum reference point for salmon management. Specific to this point, underperforming salmon stocks that do not meet their escapement goals for a sustained period (over 4–5 years) shall be appropriately managed within the stock of concern framework by the State of Alaska to ensure stocks are managed with the objective of returning them to safe biological targets.</p>	<p>Yes</p>
<p>6.3 The current stock status in relation to reference points is used to determine the level of fishing permitted. The latter is commensurate with the current state of the fishery resources (i.e., close to or above target reference point and most importantly, not overfished or at or below its limit reference point or proxy), and takes into account that long-term changes in productivity can occur due to natural variability and/or impacts other than fishing. The stock is positioned at or above the target reference point. As a minimum, the stock is located above the midway point between the target and the limit reference point. It is important to clarify that, for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance over a 4- to 5-year period shall be considered as a suitable minimum reference point for salmon management. Underperforming salmon stocks that do not meet their escapement goals for a sustained period (over 4– 5 years) shall be appropriately managed within the stock of concern framework by the State of Alaska to return them to safe biological targets. Assessors shall present evidence and evaluate escapement goals and escapement goal performance (i.e., met, not met) for all the wild salmon stock with a formal escapement goal in force in Alaska (about 300 annually). Overall, statewide summary data for Alaska can be found in the annually released ADF&G document Summary of Pacific salmon escapement goals in Alaska with a review of escapements from [year] to [year]. The document generally presents the latest 9–10 years of salmon escapement performance in review.</p>	<p>Yes</p>
<p>6.4 In the eventuality that the current level of the stock has exceeded target or limit reference points, the agreed and corresponding management action (as directed by the harvest control rule or framework) shall be immediately implemented and fishing reduced or</p>	<p>Yes</p>

<p><i>halted as necessary. The harvest control rule is effective at keeping or bringing back the stock to acceptable and safe biological levels (i.e., to avoid overfishing/ed status). Underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the stock of concern framework by the State of Alaska.</i></p>	
<p><i>6.5 There is evidence that where depleted or adversely impacted stocks, resources, and habitats have been identified, efforts have been made to ensure they are restored or allowed to recover (i.e., ideally within a two generations timescale). Underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the stock of concern framework by the State of Alaska.</i></p>	Yes
<p>Rationale:</p> <p>In the NPFMC tier system, the flatfish stocks both in BSAI and GOA are currently managed under Tier 3 (only 2 under 1a). Stocks in tier 3 are further categorized as (a), (b), or (c) based on the relationship between biomass, B40%, and a lower biomass limit, as indicated in the table in Clause 6.1. The category assigned to a stock determines the method used to calculate Acceptable Biological Catch (ABC) and OFL. The harvest control rule is biomass-based, for which fishing mortality is constant when biomass is above the B40% target and declines linearly down to the threshold value when biomass drops below the target, consistent with the precautionary approach. Below the limit specified in Tier 3c, the fishing mortality rate (FOFL) used to set the OFL is set to zero. The rule used to determine the ABC is applied in exactly the same manner, i.e. based on a harvest control rule triggered by targets and limits, and below the limit, maxFABC (fishing mortality) is set to zero. Note that the MSST threshold used to determine if a stock is overfished is a different reference point than those used in the NPFMC tier system. NPFMC Groundfish FMPs for GOA and BSAI Regions also define a B20% threshold as follows: “For groundfish species identified as key prey of Steller sea lions (i.e., walleye pollock, Pacific cod, and Atka mackerel), directed fishing is prohibited in the event that the spawning biomass of such a species is projected in the stock assessment to fall below B20% in the coming year”.</p> <p>The SAFE reports for these stocks describe the current stock status, including fishing mortality and biomass relative to reference points. The stocks in GOA and BSAI are all well above the B35% (MSY proxy) and B40% reference points, indicating they are not overfished or experiencing overfishing (see section The HCR ensures that catch limits are adjusted when stock biomass falls below B40% or to zero if it drops below Tier 1 and 3c limits. If a stock is below MSST, a rebuilding plan is implemented to restore biomass to BMSY. These measures have effectively prevented overfishing in these stocks.</p>	

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No)
<p><i>6.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that target reference points have been established and are consistent with achieving MSY, a suitable proxy, or a lesser fishing mortality—if that is optimal in the circumstances of the fishery (e.g., multispecies fisheries) or is needed to avoid severe adverse impacts on dependent predators. Examples may include stock assessment reports or fishery management plans.</i></p>	Yes
<p><i>6.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are established safe limit reference point(s) for exploitation (i.e., consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). When a limit reference point is approached, measures are taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. Examples may include stock assessment reports or fishery management plans.</i></p>	Yes
<p><i>6.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that data and assessment procedures are installed measuring the position of the fishery in relation to the reference points. Accordingly, the stock under consideration is not overfished (i.e., it is above limit reference point or proxy) and the level of fishing permitted is commensurate with the current state of the fishery resources—maintaining its future availability and taking into account that long-term changes in productivity can occur due to natural variability and/or impacts other than fishing. Examples may include stock assessment reports or fishery management plans.</i></p>	Yes
<p><i>6.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that management actions are agreed should data sources and analyses indicate that these reference points have been exceeded. Accordingly, contingency plans are agreed in advance for the appropriate management response to serious threats to the resource as a result of overfishing, adverse environmental changes, or other phenomena that may have adverse impacts on the fishery resource. Such measures may be temporary and are based</i></p>	Yes

<i>on best scientific evidence available. Examples may include stock assessment reports or fishery management plans.</i>	
6.5 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that measures are introduced to identify and protect depleted stocks and those stocks threatened with depletion, and to facilitate the sustained recovery/restoration of such stocks. Also, efforts are made to ensure that resources and essential habitats critical to the wellbeing of the stocks, which have been adversely impacted by fishing or other human activities, are restored. Examples may include laws and regulations, fishery management plans, and stock assessment reports.</i>	Yes
<p>Rationale:</p> <p>The BSAI and GOA Groundfish Fishery Management Plans (FMPs) implement a precautionary approach to managing flatfish stocks in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI). This approach includes a tier system, harvest control rules (HCRs), and reference points such as the Maximum Sustainable Yield (MSY) target, to ensure sustainable fisheries management. Key flatfish species in these regions, including BSAI and GOA flatfish stocks such as Northern rock sole, Yellowfin sole, and Flathead sole, are managed under this system.</p> <p>Recent Stock Assessment and Fishery Evaluation (SAFE) reports indicate that these flatfish stocks are above critical biomass reference points (e.g., B40%) and are not currently experiencing overfishing or overfished conditions (Barbeaux et al., 2023; Thompson and Lauth, 2023). None are below the minimum stock size threshold (MSST), and fishing mortality (F) remains below the overfishing level (FOFL), ensuring the stocks are managed sustainably (NPFMC, 2023).</p> <p>These assessments are underpinned by comprehensive projections and scenario analyses that evaluate various harvest strategies to prevent stocks from approaching overfished conditions. If a stock were to become overfished, the FMPs mandate rebuilding plans with specific fishing mortality rates (FOFL and FMSY) to restore stock health, as required under the Magnuson-Stevens Act (MSA) (Witherell et al., 2023).</p> <p>SAFE reports also incorporate ecosystem assessments, analyzing the effects of both ecosystem conditions on stock dynamics and the impacts of fishing on the broader ecosystem. These ecosystem considerations are presented annually to the North Pacific Fishery Management Council (NPFMC), providing critical context for stock management decisions. Furthermore, a risk classification framework for setting acceptable biological catch (ABC) levels is being developed, incorporating factors like assessment reliability, population dynamics, and environmental conditions, which guide decisions when ABCs are set below maximum permissible levels (Dorn and Zador, 2018; 2020).</p> <p>The precautionary management framework outlined in the FMPs ensures that GOA and BSAI flatfish stocks are managed with sustainability at the forefront, guided by robust scientific analyses. Current ABCs for these stocks reflect healthy population status, being set above biomass reference points like B40% or BMSY. Should a stock become overfished, regulatory measures are promptly adjusted to facilitate recovery to MSY levels, ensuring long-term sustainability of these critical fisheries (NPFMC, 2023).</p>	

Numerical score:	Starting score	- (Number of EPs NOT met x 3) =	Overall score
	10	0	10
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)			Full Conformance
Non-conformance Number (if applicable):			NA

Fundamental Clause 7

Management actions and measures for the conservation of stock and the ecosystem shall be based on the precautionary approach. Where information is deficient a suitable method using risk management shall be adopted to consider uncertainty.

Supporting Clause		Score
7.1	<i>The precautionary approach shall be applied widely to conservation, management, and exploitation of ecosystems to protect them and preserve the ecosystem. This should take due account of fishery enhancement procedures, where appropriate. Absence of scientific information shall not be used as a reason for postponing or failing to take conservation and management measures. Relevant uncertainties shall be taken into account through a suitable method of risk management, including those associated with the use of introduced or translocated species.</i>	Yes
7.1.1	<i>In implementing the PA, the fishery management organization shall take into account, inter alia, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality, the impact of fishing activities (including discards) on non-target and associated or dependent predators, and environmental and socioeconomic conditions.</i>	Yes
7.1.2	<i>In the absence of adequate scientific information, appropriate research shall be initiated in a timely fashion.</i>	NA
7.2	<i>In the case of new or exploratory fisheries, the fishery management organization shall adopt, as soon as possible, cautious conservation and management measures, including, inter alia, catch limits and effort limits. Such measures should remain in force until there are sufficient data to allow assessment of the impact of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment should be implemented. Management measures should, if appropriate, allow for the gradual development of the fisheries.</i>	NA

Rationale

Alaska's fisheries management in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) regions, particularly targeting flatfish species, adopts a precautionary approach as outlined in the Fishery Management Plans (FMPs) developed by the North Pacific Fishery Management Council (NPFMC). This management strategy emphasizes conservation of both target stocks and the broader marine ecosystem, especially in situations of uncertainty or limited data (NPFMC, 2023).

Precautionary Management Framework in Alaska's Flatfish Fisheries (SC 7.1, 7.1.1)

The NPFMC implements a precautionary management framework through a tiered system used to assess and manage groundfish stocks, including flatfish, in Alaska. This tier system, detailed in the GOA and BSAI Groundfish FMPs, categorizes stocks based on data availability and employs a range of reference points to guide sustainable harvest levels (Hollowed et al., 2018).

- Tier System and Harvest Control Rules (HCRs): The tier system classifies stocks based on data availability and quality. For all flatfish in the UoC, which fall into Tier 3 due to reliable estimates of spawning biomass and fishing mortality, management is guided by biomass reference points such as B40% (biomass at 40% of the unfished level). When stock biomass falls below B40%, harvest rates are reduced to prevent overfishing and maintain stock sustainability (Aydin et al., 2023).
- Reference Points and Target Biomass Levels: Spawning biomass levels are evaluated relative to MSY (Maximum Sustainable Yield)-based targets. These reference points help set limits that prevent stocks from becoming overfished, and current assessments indicate that flatfish stocks remain above B40%, signifying they are not overfished or subject to overfishing (NPFMC, 2023).
- Overfishing Limits (OFL) and Acceptable Biological Catch (ABC): The ABC for flatfish is deliberately set below the OFL to provide a buffer that accounts for uncertainties in stock assessments. This precautionary measure ensures that overfishing does not occur, even if there are unexpected variations in stock status or ecosystem changes (Dorn and Zador, 2018).

Risk Management in Data-Limited Situations (SC 7.1, 7.1.1)

When data is limited or uncertainty is high, the NPFMC employs a risk management framework that prioritizes conservation. This framework ensures precautionary measures are in place when data is deficient, reflecting the precautionary principle in Alaska’s fisheries management.

- Risk Classification Framework: The NPFMC’s risk classification system systematically reduces the ABC from its maximum permissible level by considering uncertainties related to stock assessments, population dynamics, and ecosystem factors (Dorn & Zador, 2018). This approach ensures that fishing pressure decreases as the overall risk to stocks or ecosystems increases.
- Fixed Percentage Buffers and Variable Reductions: The framework includes fixed percentage buffers that adjust based on uncertainty levels, implementing precautionary reductions in allowable catch to protect flatfish stocks and the broader ecosystem.
- Ecosystem-Based Management Considerations: Ecosystem principles are integrated into management plans, addressing impacts on non-target species, habitats, and ecosystem dynamics. Bycatch limits and prohibited species catch (PSC) controls reduce unintended ecosystem impacts, thereby mitigating risks of imbalance (Zador et al., 2017).

Adaptive Management Practices (SC 7.1, 7.1.1)

Adaptive management is a critical aspect of the precautionary approach, allowing for flexibility in response to new data or changes in stock status.

- Annual Stock Assessments: Alaska’s fisheries management conducts annual stock assessments for flatfish species, using fishery-dependent and independent data to inform management decisions based on the best available science (Zador et al., 2017).
- Ecosystem Reports: Annual ecosystem reports for the GOA and BSAI regions provide essential information on ecosystem changes affecting stock health. This data integration helps implement precautionary measures when ecosystem changes pose risks to target stocks.

Regulatory Framework and Conservation Measures (SC 7.1, 7.1.1)

The precautionary approach is mandated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), which requires the NPFMC to prevent overfishing, rebuild overfished stocks, and protect essential habitats.

- Rebuilding Plans: Should flatfish stocks become overfished, the NPFMC is required to develop rebuilding plans that restore stocks to MSY levels within a set timeframe. These plans are precautionary, reducing fishing mortality to facilitate recovery (NPFMC, 2023).
- Monitoring and Enforcement: The North Pacific Groundfish Observer Program (NPGOP) provides comprehensive monitoring, ensuring compliance with catch limits and bycatch reduction measures. The data collected supports timely and responsive management actions when needed.

The management of flatfish fisheries in the GOA and BSAI is deeply rooted in a precautionary approach prioritizing conservation and ecosystem health. Through robust regulatory frameworks, annual assessments, risk management protocols, and adaptive ecosystem-based management, Alaska’s fisheries management ensures that even in the face of uncertainty, appropriate measures are taken to prevent overfishing and promote long-term sustainability.

Finally, taking into account the availability of adequate scientific information on the stock status (SAFE reports) and the present fishery is not a new or exploratory fisheries, Supporting Clauses 7.1.2 and 7.2 are not applicable.

Evaluation Parameter Rationale - Process	Met? (Yes/No/NA)
<i>7.1 There are management measures, regulations, and laws that command or direct the use of the precautionary approach (PA) for conservation, management, and exploitation of the aquatic resources under assessment. This could either take the form of an explicit commitment to the application of the PA, or be evidenced by an overarching approach applied throughout the management literature.</i>	Yes
<i>7.1.1 There is a system in place under which the potential uncertainties listed above can be examined and taken into account during the decision-making process.</i>	Yes
<i>7.1.2 There is a process that identifies weaknesses in the scientific information available to fishery management organizations, and initiates additional research as necessary. The primary focus of this requirement is the status of the stocks under consideration.</i>	NA
<i>7.2 For new or exploratory fisheries, there is a process that allows immediate application of the PA, including catch and effort limits, and the possible adverse impact of such fisheries on the long-term sustainability of the stocks.</i>	NA

Rationale:

Precautionary approach-based reference points are used in the management of Alaskan flatfish stocks and are stated in the NPFMC FMPs for the GOA and BSAI regions. Scientific information and stock assessments available are at a consistently high level, and clearly provide the necessary basis for conservation and management decisions. Uncertainties are taken into account in the stock assessment process, in the establishment of reference points, and risk assessment is used in providing harvest options.

Potential uncertainties in the stock size, reference points, productivity, etc. are taken into account in the assessment process. Uncertainties in the management process, reference points, classification of stocks into precautionary approach tiers, setting of catch levels, etc. are explicit in the NPFMC FMPs.

Finally, taking into account the availability of adequate scientific information on the stock status (SAFE reports) and the present fishery is not a new or exploratory fisheries, Supporting Clauses 7.1.2 and 7.2 are not applicable.

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No/NA)
<i>7.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the PA is applied to conservation, management, and exploitation of an ecosystem to protect them and preserve the ecosystem. Examples may include stock assessment reports, fishery management plans and other documents.</i>	Yes
<i>7.1.1 There is evidence to demonstrate that in the fishery under assessment, uncertainties considered include those associated with the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities (including discards) on non-target and associated or dependent predators, as well as environmental and socio-economic conditions.</i>	Yes
<i>7.1.2 There is evidence that such a process has been applied in the case of the fishery under assessment, including examples of initiated research. Depending on the situation, appropriate research or further analysis of the identified risk is initiated in a timely fashion.</i>	NA
<i>7.2 There is evidence that catch and effort limits have been implemented, and other management measures, including the assessment of possible adverse impacts, have been performed for these fisheries.</i>	NA

Rationale:

In the Alaska fisheries targeting flatfish in the GOA and the BSAI, a precautionary approach is applied in the management of these stocks, as outlined by established reference points. This approach is critical for maintaining sustainable fisheries for key flatfish species in the UoC. Scientific information and stock assessments, described in detail in management protocols (see, for example, the NPFMC SAFE reports), provide a robust basis for conservation and management decisions in these fisheries. The scientific advice presented includes evaluation of stock status relative to different harvest levels, highlighting the risks associated with biomass levels falling below the adopted reference points (e.g., Dorn et al., 2019).

Stock assessments incorporate uncertainties in key parameters, including survey indices, mean weights at age, and stock-recruit relationships. These assessments use probabilistic models to evaluate the risks of exceeding

reference points under current and projected stock sizes, and these risks are explicitly presented in the catch option tables within each annual Stock Assessment and Fishery Evaluation (SAFE) report (e.g., Plan Team for the Groundfish Fisheries of the Bering Sea and Aleutian Islands, 2023, <https://meetings.npfmc.org/Meeting/Details/3018>). Extensive research on the impacts of fishing, environmental factors, and socio-economic considerations is conducted and updated annually, providing critical context for management decisions (e.g., Shotwell et al., 2022).

The overall objectives of the NPFMC management plans are to prevent overfishing and optimize yield from the fisheries, while taking into account the varying levels of uncertainty associated with different stocks. The management framework employs a tier system (Tiers 1-6) that classifies each stock based on the level of information available (NPFMC, 2023). The harvest control rules for each tier explicitly account for uncertainty, setting the Acceptable Biological Catch (ABC) below the Overfishing Limit (OFL). Total Allowable Catch (TAC) is then determined from the ABC, considering socio-economic factors and management uncertainty, maintaining the hierarchy $TAC \leq ABC < OFL$ (NPFMC, 2023).

Finally, taking into account the availability of adequate scientific information on the stock status (SAFE reports) and the present fishery is not a new or exploratory fisheries, Supporting Clauses 7.1.2 and 7.2 are not applicable.

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No)
<i>7.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the PA is applied to conservation, management, and exploitation of an ecosystem to protect them and preserve the ecosystem. Examples may include stock assessment reports, fishery management plans and other documents.</i>	Yes
<i>7.1.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in implementing the PA, the fishery management organization takes into account, inter alia, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities (including discards) on non-target and associated or dependent species, as well as environmental and socio-economic conditions. Examples may include stock assessment reports, fishery management plans and other documents.</i>	Yes
<i>7.1.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the absence of adequate scientific information, appropriate research is initiated in a timely fashion. Examples may include various data or scientific reports.</i>	NA
<i>7.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the case of new or exploratory fisheries, the fishery management organization adopts, as soon as possible, cautious conservation and management measures, including, inter alia, catch and effort limits. Such measures remain in force until there are sufficient data to allow assessment of the impact of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment are implemented. Management measures should, if appropriate, allow for the gradual development of the fisheries. Examples may include various data or scientific reports.</i>	NA

Rationale:

The reference points for flatfish stocks in the GOA and BSAI fisheries are established by the NPFMC tier system, which follows a precautionary approach as documented in the FMPs for these regions. Stock status is evaluated against these reference points annually through the SAFE reports. Where feasible, projections are included in the stock assessments to predict future biomass trajectories and assess the risks of overfishing (Shotwell et al., 2022; Barbeaux et al., 2022).

There are no current concerns regarding stock enhancement, introduced, or translocated species for the flatfish stocks considered in the GOA and BSAI regions (NPFMC, 2023). Uncertainty is addressed in the stock assessments of various species, which use models like Statistical Catch-at-Age (SCAA) and Stock Synthesis 3 (SS3). These models consider uncertainties in input parameters, recognizing that they are not error-free.

The NPFMC’s FMPs for groundfish explicitly outline how different levels of uncertainty are incorporated into management decisions, including setting catch limits and harvest control rules (NPFMC, 2023). Environmental and socioeconomic data that influence stock assessments and management strategies are well-documented through annual SAFE reports, ensuring a comprehensive evaluation of stock status and management performance (Barbeaux et al., 2022).

Finally, taking into account the availability of adequate scientific information on the stock status (SAFE reports) and the present fishery is not a new or exploratory fisheries, Supporting Clauses 7.1.2 and 7.2 are not applicable.

Fundamental Clause 8

Management shall adopt and implement effective management measures designed to maintain stocks at levels capable of producing maximum sustainable yields, including harvest control rules and technical measures applicable to sustainable utilization of the fishery, and based upon verifiable evidence and advice from available objective scientific and traditional sources.

Supporting Clause		Met? (Yes/No/NA)
8.1	<i>Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote optimum utilization, and are based on verifiable and objective scientific and/or traditional, fisher, or community sources.</i>	Yes
8.1.1	<i>When evaluating alternative conservation and management measures, the fishery management organization shall consider their cost-effectiveness and social impact.</i>	Yes
8.1.2	<i>Responsible fisheries management organizations shall adopt and implement measures necessary to ensure the management of bycatch and reduction of discards as part of fisheries management (1) in accordance with the PA, as reflected in Article 6 of the UN Fish Stocks Agreement, and as set out in Article 6.5 and 7.5 of the Code; (2) in accordance with the responsible use of fish as set out in the Code; and (3) based on the best scientific evidence available, taking into account fishers' knowledge.</i>	Yes
8.2	<i>The fishery management organization shall prohibit dynamiting, poisoning, and other similar destructive fishing practices.</i>	Yes
8.3	<i>The fishery management organization shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery. When deciding on use, conservation, and management of the resource, due recognition shall be given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs, and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements shall be made to consult all the interested parties and gain their collaboration in achieving responsible fisheries.</i>	Yes
8.4	<i>Where excess capacity exists, mechanisms shall be established to reduce capacity to levels commensurate with sustainable use of the resource. Fleet capacity operating in the fishery shall be measured and monitored. The fishery management organization shall maintain, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations and a record of all authorizations to fish allowed by them.</i>	Yes
8.4.1	<i>Studies shall be promoted that provide an understanding of the costs, benefits, and effects of alternative management options designed to rationalize fishing, especially options relating to excess fishing capacity and excessive levels of fishing effort.</i>	Yes
8.5	<i>Technical measures regarding the stock under consideration shall be taken into account, where appropriate, in relation to fish size, mesh size, gear, closed seasons or areas, areas reserved for particular (e.g., artisanal fisheries), and protection of juveniles or spawners.</i>	Yes

8.5.1	<i>Appropriate measures shall be applied to minimize catch, waste, and discards of non-target species (both fish and non-fish species), and impacts on associated, dependent, or endangered species.</i>	Yes
8.6	<i>Fishing gear shall be marked in accordance with the State's legislation in order that the owner of the gear can be identified. Gear marking requirements shall take into account uniform and internationally recognizable gear marking systems.</i>	Yes
8.7	<i>The fishery management organization and relevant groups from the fishing industry shall measure performance and encourage the development, implementation, and use of selective, environmentally safe, and cost-effective gear, technologies, and techniques that are sufficiently selective as to minimize catch, waste, discards of non-target species (both fish and non-fish species), and impacts on associated or dependent predators. The use of fishing gear and practices that lead to discarding the catch shall be discouraged, and the use of fishing gear and practices that increase survival rates of escaping fish shall be promoted. Inconsistent methods, practices, and gears shall be phased out accordingly.</i>	Yes
8.8	<i>Technologies, materials, and operational methods or measures—including, to the extent practicable, the development and use of selective, environmentally safe, and cost effective fishing gear and techniques—shall be applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution, and waste.</i>	Yes
8.9	<i>The intent of fishing selectivity and fishing impacts-related regulations shall not be circumvented by technical devices. Information on new developments and requirements shall be made available to all fishers.</i>	Yes
8.10	<i>Assessment and scientific evaluation shall be carried out on the impacts of habitat disturbance on the fisheries and ecosystems prior to the commercial-scale introduction of new fishing gear, methods, and operations. Accordingly, the impacts of such introductions shall be monitored.</i>	NA
8.11	<i>International cooperation shall be encouraged for research programs involving fishing gear selectivity, fishing methods and strategies, dissemination of the results of such research programs, and the transfer of technology.</i>	Yes
8.12	<i>The fishery management organization and relevant institutions involved in the fishery shall collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies, and on the behavior of target and non-target species regarding such fishing gear—as an aid for management decisions and with a view to minimizing non-utilized catches.</i>	Yes
8.13	<i>Where appropriate, policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. The fishery management organization shall ensure that, when selecting the materials to be used in the creation of artificial reefs, as well as when selecting the geographical location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation are observed.</i>	NA

Rationale:

The MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimum yield on a continuing basis and sets out the standards (e.g., optimal use and avoiding overfishing) which are followed in managing the AK flatfish. The Council uses a multi-tier PA, which includes OY and MSY reference points. NMFS and the Council follow a multi-faceted PA (OFL, ABC, TAC, OY) to manage the federal target stocks fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations. All vessels participating in the BSAI groundfish fisheries, other than fixed gear sablefish, require a Federal groundfish license. Licenses are endorsed with area, gear, and vessel type and length designations. Fishing permits may be authorized, for limited experimental purposes, for the target or incidental harvest of groundfish that would otherwise be prohibited. Gear types authorized by the FMP are trawls, longline (including hook-and-line, jig, troll, and

handline), pots (including longline pots and pot-and-line), and other gear as defined in regulations. Nonpelagic trawl gear modified to reduce the potential impact on bottom habitat is required when directed fishing for flatfish species in the Bering Sea subarea with nonpelagic trawl gear. For vessels using nonpelagic trawl gear, elevating devices on the sweeps are required when directed fishing for flatfish species in the Central GOA Regulatory Area. The use of nonpelagic trawl is prohibited in Cook Inlet. Three types of king crab protection areas are designated around Kodiak Island. Type I areas prohibit nonpelagic trawling year-round; and Type II areas prohibit nonpelagic trawling from February 15 to June 15; and adjacent areas designated as Type III may be reclassified by the Regional Administrator as Type I or Type II following a recruitment event. The Gulf of Alaska Slope Habitat Conservation Area is closed to nonpelagic trawling year-round. Trawling in the Marmot Bay Tanner Crab Protection Area is prohibited year-round, except for pelagic trawl gear used to directed fish for pollock. (**SC 8.1; 8.4; 8.5; 8.5.1;**). 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 National Standards for fishery management and the National Standard Guidelines require that: "The fishing mortality rate does not jeopardize the capacity of a stock or stock complex to produce MSY." The National Standards are further interpreted through the National Standard Guidelines, required by the MSA and developed and published by NMFS. The National Standard Guidelines for National Standard 1 require that: "when specifying limits and accountability measures intended to avoid overfishing and achieve sustainable fisheries, Councils must take an approach that considers uncertainty in scientific information and management control of the fishery. These guidelines describe how to address uncertainty such that there is a low risk that limits are exceeded." Since 2007, the MSA has required that all FMPs include catch limits and accountability measures that are intended to ensure that overfishing cannot reduce a stock below the level that will produce MSY on a continuing basis (NOAA, 2018; MSA, 2007). The management approach of the Council carries out objectives by considering reasonable, adaptive management measures, as described in the MSA and in conformance with the National Standards, the ESA, the NEPA, and other applicable law (NPFMC, 2020; 2020b) (**SC 8.1**)

The following objectives are directly taken from the BSAI and GOA Groundfish FMPs:

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. [Continue to use the existing optimum yield cap for the GOA 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 (SC 8.1.2):

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.*

Avoid Impacts to Seabirds and Marine Mammals:

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

23. 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.

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

25. 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:

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

27. 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.

28. Develop a Marine Protected Area policy in coordination with national and state policies.

29. Encourage development of a research program to identify regional baseline habitat information and mapping, subject to funding and staff availability.

30. 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:

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

32. Maintain the license limitation program, modified as necessary, and further decrease excess fishing capacity and overcapitalization by eliminating latent licences and extending programs such as community or rights-based management to some or all groundfish fisheries.

33. Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of access rights based on performance.

34. 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 (SC 8.3):

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

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

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

Improve Data Quality, Monitoring and Enforcement:

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

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

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

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

42. 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.

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

44. 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.

Exempted fishing permits (EFPs) allows fishing activities that would otherwise be prohibited by fishery management plans. EFPs are issued for a variety of purposes, including:

- Research: Landing undersized fish, collecting fish for public display, and developing seafood products
- Conservation: Conservation engineering and environmental cleanup
- Data collection: Collecting data on size, sex, and other characteristics of fish
- Health and safety: Conducting health and safety surveys

- Hazard removal: Removing hazards

EFPs are issued by NOAA Fisheries under the Magnuson-Stevens Act. EFPs can be an important tool for fisheries management, as they allow for experimentation to explore new practices and scientific approaches. In some cases, EFP projects have provided the scientific information needed to make regulatory changes (**SC 8.4.1**)

AFSC also runs the Economic and Social Sciences Research Program in Alaska. The aim of the Program is to provide economic and sociocultural information to assist NMFS in meeting its stewardship responsibilities with activities being conducted in support of this mission. The Council has established the Social Science Planning Team to improve the quality and application of social science data that informs management decision-making and program evaluation. The FMPs include a substantial section on the economic and socioeconomic characteristics of the fisheries and communities in Alaska. There is a detailed annual SAFE report on economic status of Alaskan fisheries (Aydin et al. 2023; Adams et al. 2023) and a section on economics in the SAFE reports. Harvest levels for each groundfish species or species group that are set by the Council for a new fishing year are based on the best biological, ecological, and socioeconomic information available, and follow a rigorous and public peer-reviewed process. (**SC 8.1.1; 8.4.1**)

As listed in the FMPs and in NMFS regulations, the only legal gears for taking AK flatfish in the Alaskan fisheries are pelagic trawl, bottom trawl, jig, longline, and pot. The UoC is only for non-pelagic trawl. Regulations pertaining to vessel and gear markings in the fishery are established in NMFS and ADFG regulations as prescribed in the annual management measures published in the Federal Register. There is no evidence that indicated the marking of gear is not being followed or is not effective. No destructive gears such as dynamite or poison are permitted, nor is there any evidence that such methods are being used illegally. There is no evidence that regulations involving gear selectivity in BSAI and GOA flatfish in Alaska fisheries are being circumvented either by omission, or through the illegal use of gear technology. Evidence provided by fishing fleets indicates that lost fishing gear is minimal. A NOAA (2015) study shows ghost fishing mortality and gear loss for derelict trawl (and other gears such as longline) are likely to be lower in comparison to gillnets and trap gears, although less is known of the effects of derelict trawls and longlines. The gear regulations also contain details on mesh sizes permitted, biodegradable panels in pot gears, types of hook and line gear allowed, etc. The use of bottom contact gear is prohibited in the Gulf of Alaska Coral and Alaska Seamount Habitat Protection Areas year-round. Fishing with trawl vessels is not permitted year-round in the Crab and Halibut Protection Zone and the Pribilof Island Habitat Conservation Area. Also, a number of closure zones for trawl gears are described in the FMPs for GOA and BSAI. A suite of measures specific to seabird avoidance in hook and line fisheries in Alaskan waters also exists, and data on seabirds are collected by observers, and included in the SAFE documents. Various measures to reduce bycatches of PSC species (e.g., crabs, halibut, Chinook) in BSAI and GOA, including gear modifications and closed areas and seasons, have been adopted in recent years. Other industry-driven measures taken to reduce halibut catch include use of excluder devices, improved communication and data sharing among vessels to avoid halibut, and enhanced deck sorting to reduce mortality of halibut returned to the sea (Gauvin 2013). Exempted fishing permits have been issued for deck sorting on Amendment 80 C/Ps to reduce halibut mortality, and implementing regulations were adopted in October 2019. Numerous measures to protect Steller sea lion populations and habitat affect are implemented in the FMPs for GOA and BSAI groundfish. NMFS and the Council must describe and identify EFH in FMPs, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. Further details on this are described under Fundamental Clause 12 below. (**SC 8.2; 8.5; 8.5.1; 8.6; 8.7; 8.9**).

The Council and BOF have extensive processes in place to allow for identifying and consulting with domestic parties having interest in the Alaska groundfish fisheries. The Council is responsible for allocation of the target stocks resource among user groups in Alaskan waters, and the BOF public meeting process provides a regularly scheduled public forum for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaskan Native organizations and other governmental and non-governmental entities that catch target stocks off Alaska to participate in the development of legal regulations for fisheries. Organizations and individuals involved in the fishery and management process have been identified. The Alaska management process has many stakeholders, including license holders, processors, fishermen's organizations, cooperatives, coalitions, the states of Alaska, Washington, and Oregon, CDQ groups, and environmental groups. The Council's process is the primary means for soliciting stakeholder information important to the fisheries, and this is fully transparent and open to the public. Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. Fishing industry stakeholders work extensively with fishery scientists, managers, and other industry members on various initiatives to ensure sustainability of Alaska flatfish complex fisheries. The Council established a Rural Outreach Committee in 2009 to improve outreach and communications with rural communities and Alaska Native entities and develop a method for systematic documentation of Alaska Native and community participation in the development of fishery management actions. The Western Alaska CDQ Program, established by the Council in 1992, allocates a percentage of all BSAI quotas for groundfish, prohibited species, halibut, and crab to eligible communities. There are approximately 65 communities within a 50-mile radius of the BS coastline who participate in the program.

The fisheries for flatfish in Alaska are conducted by U.S. vessels only. In adjacent waters of the GOA cooperation on research and management between Canada and the United States occurs as part of the science and management process (**SC 8.11**). The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee April 2024 has further information. https://www.psmfc.org/tsc-drafts/2024/AFSC_2024_TSC_Report.pdf

There are numerous measures implemented in Alaskan fisheries to minimize non-utilized catches, such use prohibition of discarding (Improved Retention/Improved Utilization Program), use of salmon and halibut excluder devices in trawl nets, and use of streamers on longline gear to reduce seabird bycatch. Many of the studies and subsequent implementation have involved cooperative efforts between researchers at institutions in NMFS, ADFG, universities, and industry, and are introduced into regulations only after extensive testing has occurred. Key studies include research on excluder devices, deck sorting of halibut, and research on pots to reduce Tanner crab bycatch (**SC 8.12**). Additional information on bycatch is presented in Fundamental Clause 12 below.

There have not been any new gear types in the last three years, nor is there artificial reef structures, thus 8.10 and 8.13 are not applicable.

Evaluation Parameter Rationale - Process	Met? (Yes/No/NA)
8.1 <i>The process by which management measures are developed for the fishery utilizes the best scientific evidence available, including traditional sources where these are verifiable, and also considers the cost-effectiveness and social impact of potential new measures. The assessment team shall provide evidence for the main type of management measures present in the fishery. Some of the main examples may include (but are not limited to) legal gear specifications, permit requirements, observer requirements, reporting requirements, limited access, vessel license limitations, size limits, sex restrictions, total allowable catch, in season adjustments, fishing seasons, geographical registrations areas, bycatch reduction devices, gear modification, minimizing waste and ghost fishing, closed waters, catch limits for other fisheries, and bycatch management.</i>	Yes
8.1.1 <i>The process by which management measures are developed for the fishery allows for consideration of the cost-effectiveness and social impact of potential new or modified management measures.</i>	Yes
8.1.2 <i>The responsible fisheries management organizations has adopted and implemented effective measures necessary to ensure the management of bycatch and reduction of discards as part of fisheries management.</i>	Yes
8.2 <i>There are management measures, or regulations, or laws that prohibit destructive fishing practices.</i>	Yes
8.3 <i>There is a process that allows for identifying and consulting with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs, and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of the fisheries resource.</i>	Yes
8.4 <i>There is a system to measure fleet capacity and maintain regularly updated data on all fishing operations. Research has been conducted to determine or estimate the fishing capacity commensurate with the sustainable use of the resource. There are mechanisms in place to measure the total fishing capacity within the unit of certification, and to reduce this capacity if it is determined to exceed the sustainable level.</i>	Yes
8.4.1 <i>There is a need and a process that allows, as appropriate, for studies to understand the costs, benefits, and effects of alternative management options designed to rationalize fishing.</i>	Yes
8.5 <i>The management system has taken into account technical measures, where and as appropriate (i.e., some fisheries do not have the requirement for a minimum fish size), to the fishery and stock under assessment, in relation to fish size, mesh size, gear, closed seasons, closed areas, areas reserved for particular (e.g., artisanal) fisheries, and protection of juveniles or spawners.</i>	Yes
8.5.1 <i>There is a mechanism by which management measures are developed to minimize the catch, waste and discarding of non-target species and the impact of the fishery on associated, dependent, and ETP species. This system shall include the development of specific management objectives.</i>	Yes
8.6 <i>There is regulation for gear marking.</i>	Yes
8.7 <i>The management system and relevant groups from the fishing industry have encouraged the development of technologies and operational methods to reduce waste and discard of the target species. Relevant groups includes fishers, processors, distributors, and</i>	Yes

<i>marketers. There are mechanisms in place by which the selectivity, environmental impact, and cost-effectiveness of gears included in the unit of certification are measured.</i>	
<i>8.8 There has been development of technologies, materials, and operational methods that minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, and a system to minimize pollution and waste.</i>	Yes
<i>8.9 There is a system that makes available information on new developments and requirements to all fishers to avoid circumvention of fishing regulations.</i>	Yes
<i>8.10 New gear has been recently introduced on a commercial scale within the last 3 years, or there is a plan to introduce new gear in the foreseeable future.</i>	Yes
<i>8.11 There is a system of international information exchange to allow knowledge to be shared.</i>	Yes
<i>8.12 There is collaborative research into fishing gear selectivity, fishing methods, and strategies.</i>	Yes
<i>8.13 There is a mechanism in place for identifying potential for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. This mechanism ensures that where artificial structures are deemed appropriate, environmental protection, safety, and navigation are considered in their application.</i>	NA
Rationale:	
<p>As noted in the rationale for the Supporting Clauses, there are mechanisms and objectives in place in the BSAI and GOA FMPs, along with the MSA, National Standards to reduce bycatch and ensure the conservation of the resources, surrounding habitat and impact to other species. There have been numerous regulations, as well as technological developments, aimed at reducing waste and discards in the AK flatfish fisheries, and to ensure that the resources are harvested sustainably. These include various measures to address fish size, discards, and closed seasons and areas. Specific examples include development of excluder devices for trawl gear to reduce these by-catches, and closures of large areas to protect numerous endangered species (including salmon, crab, and marine mammals). Since 1998, full retention of flatfish in Alaska is required in all Alaskan fisheries under the Improved Retention/Improved Utilization Program. In addition, some vessels have made various gear modifications to avoid catch of smaller fish, and/or to minimize bottom contact. Marine Reserve Areas (MRAs) are put in place to help manage bycatches in groundfish fisheries. Fishing industry groups such as cooperatives and coalitions have undertaken numerous conservation-oriented measures in relation to fish size, bycatch avoidance, and product utilization. NMFS has a full suite of fishery regulations for Alaskan waters which cover all aspects of fishing, including seasons, gear limitations, and numerous area closures.</p>	

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No)
<i>8.1 There is evidence that the overall framework of management measures in place is effective at achieving the long-term optimum yield, which is defined by the FAO as “the harvest levels for a species that achieves the greatest overall benefits, including economic, social and biological considerations.” If the stock has been maintained above the limit reference point, this shall be taken as evidence that management measures are effective in avoiding overfishing.</i>	Yes
<i>8.1.1 There is evidence for the consideration of the cost-effectiveness and social impact of potential new or modified management measures.</i>	Yes
<i>8.1.2 There is evidence of adoption and implementation of effective measures to ensure the management of bycatch and reduction of discards as part of fisheries management (1) in accordance with the PA, as reflected in Article 6 of the UN Fish Stocks Agreement, and as set out in Article 6.5 and 7.5 of the Code; (2) in accordance with the responsible use of fish as set out in the Code; and (3) based on the best scientific evidence available, taking into account fishers’ knowledge. Please note that traditional knowledge should be verifiable. The strategy to ensure the management of bycatch and reduction of discards as part of fisheries management is being implemented successfully (e.g., there is a well-known track record of consistently setting conservative bycatch limits based on quality information and advice about bycatch); or bycatch is minimized to the greatest extent possible, especially for vulnerable species such as sharks, seabirds, turtles, and marine mammals, through mitigation measures that have been shown to be highly effective (e.g., observer coverage and procedures, bycatch caps, utilization measures, full catch accounting, on-deck techniques, avoidance mechanisms and gear technology, etc.). Also, the fishery is not a leading cause of a high level of mortality for any species of concern (e.g., not a Category I fishery for marine mammal bycatch as designated by the National Marine Fisheries Service).</i>	Yes

8.2 The regulations or laws effectively prohibit dynamiting, poisoning, and other similar destructive fishing practices.	Yes
8.3 In accordance with national laws and regulations, there is evidence that domestic parties having a legitimate interest in the use and management of the fishery (as described above) have been identified and encouraged to collaborate in the fisheries management process.	Yes
8.4 There is evidence of the size of fleet capacity, and of data describing fishing operation, and that the mechanisms described above are successful at maintaining the effective fishing capacity of the unit of certification at a level commensurate with the sustainable use of the resource. Management mechanisms, which restrict the application of fishing capacity, such as quotas, shall be considered valid mechanisms in relation to this parameter. The core emphasis of this requirement is to ensure that exploitation is sustainable. Assessment teams should ensure that fisheries are within catch limit recommendations to determine whether excess capacity is having an effect on resource overexploitation.	Yes
8.4.1 There is evidence for studies conducted on alternative management options designed to rationalize fishing.	Yes
8.5 Technical measures are related to sustainability objectives, ensuring sustainable exploitation of the target species, and minimizing the potential negative impacts of fishery activities on non-target species, ETP species, and the physical environment.	Yes
8.5.1 There are measures in place to minimize catch, waste, and discards of nontarget species (both fish and non-fish species). These measures are considered effective at achieving the specific management objectives described in the process parameter. There are measures in place to minimize impacts on associated, dependent, or endangered species. These measures are considered effective at achieving the specific management objectives described in the process parameter.	Yes
8.6 Fixed gear is marked according to national legislation, and lost fixed gear can be identified back to owner.	Yes
8.7 Such technologies and operational methods have been implemented. The methods in use are effective in reducing waste and discards of the non-target species. There is evidence that the gears used in the fishery are appropriate, in terms of selectivity, environmental impact, and cost-effectiveness, as assessed by the responsible scientific authority of the fishery. Methods shall be considered successful if there is evidence that the fishery under assessment is not causing significant risk of overfishing to non-target species.	Yes
8.8 Technologies, materials, and operational methods that minimize the loss of fishing gear and ghost fishing by lost or abandoned gear are applied whenever appropriate. Also, these measures are effective in minimizing, to the extent practicable, pollution and waste.	Yes
8.9 The adopted methods are successful and effective and fishing regulations are made known to the participants. Enforcement data are highlighting significant violations.	Yes
8.10 An appropriate assessment of potential impacts has been carried out. There is evidence to suggest that the assessment is adequate to support habitat conservation and fishery management purposes. Additionally, there is a monitoring regime in place.	Yes
8.11 There is evidence for international information exchange, such as meeting records or other information.	Yes
8.12 There is evidence of such research, and the results have been applied accordingly in fisheries management.	Yes
8.13 This mechanism has been applied to the stocks under consideration, resulting in the conclusion to either use artificial structures, or that artificial structures are inappropriate. Care has been taken in the selection of materials to use in constructing artificial reefs, the selection of sites for their deployment, and to ensure that relevant conventions concerning the environment and the safety of navigation have been observed.	NA
Rationale: Evidence can be seen in the FMPs, the SAFE reports, stock assessments and in the fishery regulations. See the rationale above for further details.	

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No/NA)
8.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that conservation and management measures are designed to ensure the long-term sustainability of fishery resources at levels which promote optimum utilization, and are based on verifiable and objective scientific and/or traditional, fisher, or community sources. Examples may include reports, fishery management plans, regulations, or other management measures.	Yes
8.1.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the evaluation of alternative conservation and management measures, their cost-	Yes

<i>effectiveness and social impact are considered. Examples may include reports, fishery management plans, regulations or other management measures.</i>	
<i>8.1.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the responsible fisheries management organizations have adopted and implemented effective measures necessary to ensure the management of bycatch and reduction of discards as part of fisheries management. Examples may include stock assessment, bycatch or other ecosystem assessment reports.</i>	Yes
<i>8.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization prohibits dynamiting, poisoning, and other similar destructive fishing practices. Examples may include laws, fishery management plans, regulations, and enforcement data.</i>	Yes
<i>8.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization seeks to identify domestic parties having a legitimate interest in the use and management of the fishery. When deciding on use, conservation, and management of the resource, due recognition is given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs, and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements are made to consult all the interested parties and gain their collaboration in achieving responsible fisheries. Examples may include laws, fishery management plans, regulations, and meeting records.</i>	Yes
<i>8.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fleet capacity operating in the fishery is monitored and measured, and statistical data on all fishing operations allowed is updated and maintained. Where excess capacity exists, mechanisms are established to reduce capacity to levels commensurate with sustainable use of the resource. Examples may include fleet reports or other documents or reports.</i>	Yes
<i>8.4.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that studies are promoted that provide an understanding of the costs, benefits, and effects of alternative management options designed to rationalize fishing, especially options relating to excess fishing capacity and excessive levels of fishing effort. Examples may include various evaluation or reports on fishing rationalization.</i>	Yes
<i>8.5 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that technical measures regarding the stock under consideration are taken into account, where appropriate, in relation to fish size, mesh size, gear, closed seasons, closed areas, areas reserved for particular (e.g., artisanal) fisheries, and protection of juveniles or spawners. Examples may include fishery management plans, regulations or various other reports.</i>	Yes
<i>8.5.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that appropriate measures are applied to minimize catch, waste and discards of non-target species (both fish and non-fish species), and impacts on associated, dependent, or endangered species. Examples may include various stock and ecosystems assessment reports.</i>	Yes
<i>8.6 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fishing gear is marked in accordance with State's legislation in order that the owner of the gear can be identified. Gear marking requirements take into account uniform and internationally recognizable gear marking systems. Examples may include various fleet reports and regulations.</i>	Yes
<i>8.7 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization and relevant groups from the fishing industry measure performance and encourage the development, implementation, and use of selective, environmentally safe, and cost effective gear, technologies and techniques, that are sufficiently selective as to minimize catch, waste, discards of non-target species (both fish and non-fish species), and impacts on associated or dependent species. Examples may include various reports, regulations, or other data.</i>	Yes
<i>8.8 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate those technologies, materials, and operational methods or measures—including, to the extent practicable, the development and use of selective, environmentally safe, and cost effective fishing gear and techniques—are applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution, and waste. Examples may include various regulations, data, and reports.</i>	Yes
<i>8.9 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the intent of fishing selectivity and fishing impacts-related regulations is not circumvented by technical devices. Information on new developments and requirements is made available to all fishers. Examples may include various data and reports.</i>	Yes

8.10 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that assessment and scientific evaluation is carried out on the implications of habitat disturbance impact on the fisheries and ecosystems prior to the commercial-scale introduction of new fishing gear, methods, and operations. Accordingly, the effects of such introductions are monitored. Examples may include various regulations, data, and reports.	Yes
8.11 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that international cooperation is encouraged for research programs involving fishing gear selectivity, fishing methods and strategies, dissemination of the results of such research programs, and the transfer of technology. Examples may include various data and reports.	Yes
8.12 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization and relevant institutions involved in the fishery collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies, and on the behavior of target and non-target species in relation to such fishing gear—as an aid for management decisions and with a view to minimizing non-utilized catches. Examples may include various data and reports.	Yes
8.13 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that where appropriate, policies are developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. The fishery management organization shall also ensure that, when selecting the materials to be used in the creation of artificial reefs, as well as when selecting the geographical location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation are observed. Examples may include various laws, data and reports.	NA
Rationale:	
See rationale above under the Supporting Clauses.	

Numerical score:	Starting score	- (Number of EPs NOT met x 3) =	Overall score
	10	0	10
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)			Full Conformance
Non-conformance Number (if applicable):			NA

Fundamental Clause 9

Fishing operations shall be carried out by fishers with appropriate standards of competence in accordance with international standards, guidelines and regulations.

Supporting Clause		Met? (Yes/No/NA)
9.1	<i>States shall advance, through education and training programs, the education and skills of fishers and, where appropriate, their professional qualifications. Such programs shall take into account agreed international standards and guidelines.</i>	Yes
9.2	<i>States, with the assistance of relevant international organizations, shall endeavour to ensure, through education and training, that all those engaged in fishing operations be given information on the most important provisions of the FAO CCRF (1995), as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.</i>	Yes
9.3	<i>The fishery management organization shall, as appropriate, maintain records of fishers which shall, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their State's laws.</i>	Yes

Rationale:

Programs are available at various institutions that provide training and education for those seeking to enter commercial fishing or a maritime career. For example, the Alaska Maritime Workforce Development Plan was developed in 2014 by representatives of Alaska Fisheries, Seafood, and Marine Industry Sectors, Alaska State Agencies and the University of Alaska to support a sustainable maritime workforce in Alaska.¹⁵

The NOAA Fisheries Alaska Marine Education and Training Mini-Grant Program supports projects that will increase sustainability, communication, education, and training on marine resource issues and education for marine-related professions in Alaska. Projects prepare communities for employment in marine-related professions by supporting aquaculture; increasing seafood and fishing safety, seafood marketing, or management; and by increasing the sustainability of fishing practices through technology improvements. Further details can be found under the NOAA Fisheries Funding opportunities.¹⁶ **(SC 9.1)**

The 1995 Code of Conduct for Responsible Fisheries or—CCRF—sets out international principles and standards of behavior to ensure effective conservation, management, and development of both marine and freshwater living aquatic resources. It accounts for the impact of fishing on ecosystems, the impact of ecosystems on fisheries, and the need to conserve biodiversity. The CCRF is voluntary, although parts of it are based on relevant international laws. NMFS, the Council and ADFG have rules and regulations governing AK fisheries available on their websites. The BSAI and GOA FMPs also contain a summary of management measures that apply to these fisheries. These also cover legal definitions such as quota shares, individual fishing quotas, etc **(SC 9.2)**.

Data on the number and location of Alaskan fishers, permits issued, etc. can be found in the annual SAFE documentation. Information on Alaska sport fish and crew license holders has been compiled through the Alaska Fisheries Information Network. Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska’s Commercial Fisheries Entry Commission (CFEC) website.¹⁷ Fishermen in the state-managed fisheries must register prior to fishing and are required to keep a logbook during the fishery. Completed logbook pages must be attached to the ADFG copy of the fish ticket at the time of delivery. USCG also maintains records and issues credentials on licenses for crewmembers, including engineers, captains, mates, deckhands, etc. The State of Alaska issues commercial fishing licenses for all crew **(SC 9.3)**.

Evaluation Parameter Rationale - Process	Met? (Yes/No/NA)
<i>9.1 There are implemented education programs for fishers (e.g., health and safety, fisheries management framework, rule and regulation, etc.).</i>	Yes
<i>9.2 There are relevant measures of the FAO CCFR and other applicable environmental and other standards being exposed to fishers for their training.</i>	Yes
<i>9.3 There is a system to collect and maintain fisher records.</i>	Yes
Rationale:	
See above.	

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No/NA)
<i>9.1 These programs are effective in training fishers, in line with international standards and guidelines.</i>	Yes
<i>9.2 These programs are effective in training fishers, in line with international standards, guidelines, and key CCRF principles. The presence of general training programs for fishermen (e.g., health and safety, fisheries management framework, rule and regulation, etc.) shall be evidence that the key principles of the CCRF have been filtered down from management to fishermen. Furthermore, the existence of laws and regulation with which fishermen are compliant demonstrate further compliance to this clause.</i>	Yes
<i>9.3 These records are considered accurate and effective for management purposes.</i>	Yes
Rationale:	
See rationale above.	

¹⁵ https://www.alaska.edu/fsmi/AKMaritimeWFDPlan_HighRes_5-22-14.pdf

¹⁶ <https://www.fisheries.noaa.gov/alaska/funding-financial-services/alaska-region-funding-opportunities>

¹⁷ <https://www.cfec.state.ak.us/>

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No/NA)
9.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States enhance, through education and training programs, the education and skills of fishers and, where appropriate, their professional qualifications. Such programs take into account agreed international standards and guidelines. Examples may include various data, websites.	Yes
9.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States, with the assistance of relevant international organizations, endeavor to ensure, through education and training, that all those engaged in fishing operations be given information on the most important provisions of the FAO CCRF, as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations. Examples may include various data, websites.	Yes
9.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization maintains, as appropriate, records of fishers which, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws. Examples may include various data or reports.	Yes
Rationale:	
See rationale above.	

	Starting score	- (Number of EPs NOT met x 3) =	Overall score
Numerical score:	10	0	10
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)			Full Conformance
Non-conformance Number (if applicable):			NA

Fundamental Clause 10

An effective legal and administrative framework shall be established and compliance ensured, through effective mechanisms for monitoring, surveillance, control, and enforcement for all fishing activities within the jurisdiction.

Supporting Clause	Met? (Yes/No)
10.1 <i>Effective mechanisms shall be established for fisheries monitoring, surveillance, control, and enforcement measures including, where appropriate, observer programs, inspection schemes, and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher, or community approaches, provided their performance could be objectively verified.</i>	Yes
10.2 <i>Fishing vessels shall not be allowed to operate on the stock under consideration in question without specific authorization.</i>	Yes
10.3 <i>States involved in the fishery shall, in accordance with international law, and within the framework of fisheries management organizations or arrangements, cooperate to establish systems for monitoring, control, surveillance, and</i>	NA

	<i>enforcement of applicable measures with respect to fishing operations and related activities in waters outside the States jurisdiction.</i>	
10.3.1	<i>Fishery management organizations which are members of or participants in fisheries management organizations or arrangements, shall implement internationally agreed measures adopted in the framework of such organizations or arrangements and consistent with international law to deter the activities of vessels flying the flag of non-members or nonparticipants engaging in activities that undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, port States shall also proceed, as necessary, to assist other States in achieving the objectives of the FAO CCRF (1995), and should make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State.</i>	NA
10.4	<i>Flag States shall ensure that no fishing vessels are entitled to fly their flag, fish on the high seas or in waters under the jurisdiction of other States, unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels shall carry on board the Certificate of Registry and their authorization to fish.</i>	NA
10.4.1	<i>Fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State shall be marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels.</i>	NA

Rationale:

The U.S measures for regulating the BSAI and GOA fisheries are found in [50 CFR 600](#) and [50 CFR 679](#). Gear types authorized by the FMP are trawls, hook-and-line, pots, jigs, and other gear as defined in regulations. The fishery is primarily managed by required licenses and/or permits, fishing seasons, annual TACs, closed areas, catch restrictions.

Annually, the Council develops harvest specifications based on information from the Groundfish Plan Teams, SSC, AP, the public, and any other relevant information. Harvest specifications include overfishing limit, acceptable biological catch (ABC), total allowable catch (TAC), ABC surplus and ABC reserve. Final harvest specifications are implemented by mid-February each year to replace those in effect for that year and based on new information contained in the latest groundfish SAFE reports. Current harvest specifications can be found at the following link: <https://www.npfmc.org/fisheries-issues/issues/harvest-specs/>.

Monitoring, control and surveillance (MCS) is carried out at-sea and shore-side for the federal fisheries by the NMFS Office of Law Enforcement (OLE) and the U.S. Coast Guard (USCG and Alaska Wildlife Troopers (AWT) at the State level. 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, 2019). 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 NOAA Fisheries—maximizing productivity of sustainable fisheries and fishing communities and protection, recovery, and conservation of protected species. There is also a Cooperative Enforcement Program in place, which is a partnership with the federal and state agencies that increases the enforcement activities and promotes compliance with federal laws and regulations.

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 (**SC 10.1; 10.2**)

There is also a comprehensive, industry-funded, at sea and on shore Observer Program. All sectors of the groundfish fishery may be required to carry one or more observers or an electronic monitoring system for at least a portion of their fishing time. NMFS develops an Annual Deployment Plan and makes adjustments to the plan after scientific evaluation of data collected under the Observer Program. Vessels and processors in the full observer coverage category are required to obtain observer coverage by contracting directly with observer providers to meet coverage requirements in regulation. The AK flatfish 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 AK flatfish fishery. (**SC 10.1, 10.2**)

Evaluation Parameter Rationale - Process	Met? (Yes/No/NA)
<i>10.1 There are clear mechanisms established for fisheries monitoring, surveillance, control, and enforcement.</i>	Yes
<i>10.2 There is a mechanism or system established to maintain a record of fishing authorizations.</i>	Yes
<i>10.3 There is a mechanism or system established to conduct enforcement operations outside the State's jurisdiction.</i>	NA
<i>10.3.1 There are regulations established against vessels flying the flag of non-member or non-participant States, which may engage in activities that undermine the effectiveness of conservation and management measures established by fisheries management organizations.</i>	NA
<i>10.4 There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.</i>	NA
<i>10.4.1 There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.</i>	NA
Rationale: As noted in the rationale above, there is a required MCS system in place and required by Federal law for the AK flatfish fishery. A federal groundfish license is required for catcher vessels, including catcher/processor, and all participants in the AK flatfish fishery. There is mandatory full observer coverage and additional observer requirements for vessels classified as catcher processors (CPs) and as CPs; using trawl gear and groundfish CDQ fishing. 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.	

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No)
<i>10.1 These mechanisms are effective, and include effective observer programs, inspection schemes, and vessel monitoring systems where appropriate for the type of fishery under assessment. Monitoring, surveillance, control, and enforcement mechanisms can be considered effective if they are sufficiently broad to cover the entirety of the unit of certification, there is evidence that rules and regulations are consistently enforced, and there is no evidence of frequent or widespread violation of fishery regulations. This could include relevant traditional, fisher, or community approaches, provided their performance could be objectively verified. With respect to fisheries on the high seas, the legal obligations of UNCLOS and UNFSA have particular relevance. Evidence of the performance of the legal framework can be derived from assessing conformance with requirements covering compliance and enforcement. Specifically, the assessment team shall document the general level/type of fisheries controls (e.g., number of boarding's, reprimands) and the respective level of fisheries violations (e.g., %) on a yearly basis.</i>	Yes
<i>10.2 This mechanism is effective for maintaining updated records of fishing authorizations and ensuring fishing vessels operate with appropriate authorization.</i>	Yes
<i>10.3 This mechanism is enforcing operations in internationally occurring fisheries. If the stock under consideration is not transboundary, shared, straddling, highly migratory or high seas, then the Standard need only be concerned with the effectiveness and suitability of the monitoring, surveillance, control, and enforcement activities at the States level for the fishery</i>	NA

<i>of which the unit of certification is a part. If the unit of certification is part of a States fleet fishing on a transboundary, shared, straddling, highly migratory or high seas stock, then it is still likely to be the effectiveness and suitability of the monitoring, surveillance, control, and enforcement activities at the States level that shall be assessed. If the unit of certification covers all the fishing on the stock under consideration, then the monitoring, surveillance, control, and enforcement of all of the States fleets is of concern and shall be assessed (to ensure full consideration of total fishing mortality on the stock under consideration).</i>	
<i>10.3.1 These measures are effective in deterring such practices.</i>	Yes
<i>10.4 These vessels have been issued with a Certificate of Registry and they are required to carry it on board.</i>	Yes
<i>10.4.1 Foreign vessels authorized to fish in the State's EEZ or its vessels fishing in another State's EEZ have been marked accordingly to international guidelines.</i>	NA
Rationale:	
All vessels fishing in Alaska need to be registered and meet all requirements of the Alaska Department of Fish and Game (ADF&G). Details of the permit and participation restrictions can be found in Section 3.3 of the BSAI ¹⁸ and GOA FMP ¹⁹ . Evidence of these actions can also be found in Groundfish SAFE reports, and in annual observer reports from the North Pacific Observer Program. ²⁰	

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No/NA)
<i>10.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that effective mechanisms are established for fisheries monitoring, surveillance, control, and enforcement measures including, where appropriate, observer programs, inspection schemes, and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified. Examples may include rules and regulations, enforcement reports.</i>	Yes
<i>10.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fishing vessels are not allowed to operate on the stock under consideration in question without specific authorization. Examples may include various data.</i>	Yes
<i>10.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States involved in the fishery do, in accordance with international law, and within the framework of fisheries management organizations or arrangements, cooperate to establish systems for monitoring, control, surveillance, and enforcement of applicable measures with respect to fishing operations and related activities in waters outside their States jurisdiction. Examples may include enforcement reports.</i>	NA
<i>10.3.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organizations which are members of or participants in fisheries management organizations or arrangements implement internationally agreed measures adopted in the framework of such organizations or arrangements and consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants engaging in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, port States also proceed, as necessary, to achieve and to assist other States in achieving the objectives of the FAO CCRF, and make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State. Examples may include enforcement or other reports.</i>	NA
<i>10.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the flag State ensures that no fishing vessels are entitled to fly their flag, fish on the high seas or in waters under the jurisdiction of other States, unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels shall carry on board the Certificate of Registry and their authorization to fish. Examples may include various laws, regulations, and other data or reports.</i>	NA

¹⁸ <https://www.npfmc.org/wp-content/uploads/BSAIfmp.pdf>

¹⁹ <https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmfp.pdf>

²⁰ <https://www.fisheries.noaa.gov/alaska/fisheries-observers/north-pacific-observer-program>

10.4.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State, are marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. Examples may include various laws, regulations, and other data or reports.

NA

Rationale:

Evidence of the MCS system in place for the AK flatfish fisheries can be found in annual observer reports, observed catch tables and in enforcement reports from the Office of Law Enforcement to the Council. The following links can be accessed for further details on the monitoring actions for this fishery.

<https://www.fisheries.noaa.gov/resource/document/north-pacific-observer-program-2022-annual-report>

<https://www.fisheries.noaa.gov/alaska/fisheries-observers/observed-and-monitored-catch-tables>

NOAA, 2023c. Office of Law Enforcement Alaska Division. Report to North Pacific Fishery Management Council. December 2023. <https://meetings.npfmc.org/CommentReview/DownloadFile?p=475936fa-58f5-4403-b98a-21a19244e4ef.pdf&fileName=B4%20OLE%20Report.pdf>

USCG 17th District enforcement report <https://meetings.npfmc.org/CommentReview/DownloadFile?p=fcb2e345-48b5-45af-91ef-a65e4d628257.pdf&fileName=B7%20USCG%20Report.pdf>

	Starting score - (Number of EPs NOT met x 3) =		Overall score
Numerical score:	10	0	10
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)			Full Conformance
Non-conformance Number (if applicable):			NA

Fundamental Clause 11

There shall be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations.

Supporting Clause		Met? (Yes/No/NA)
11.1	<i>State laws of adequate severity shall be in place that provide for effective sanctions.</i>	Yes
11.2	<i>Sanctions applicable to violations and illegal activities shall be adequate in severity to be effective in securing compliance and discouraging violations wherever they occur. Sanctions shall also be in force to affect authorization to fish and/or to serve as masters or officers of a fishing vessel in the event of non-compliance with conservation and management measures.</i>	Yes
11.3	<i>Fisheries management organizations shall ensure that sanctions for IUU fishing by vessels and, to the greatest extent possible, nationals under its jurisdiction are of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. This may include the adoption of a civil sanction regime based on an administrative penalty scheme. Fisheries management organizations shall ensure the consistent and transparent application of sanctions.</i>	Yes
11.4	<i>Flag States shall take enforcement measures towards fishing vessels entitled to fly their flag which have been found by the State to have contravened applicable conservation and management measures. The State shall, where appropriate, make the contravention of such measures an offense under national legislation.</i>	NA

Rationale

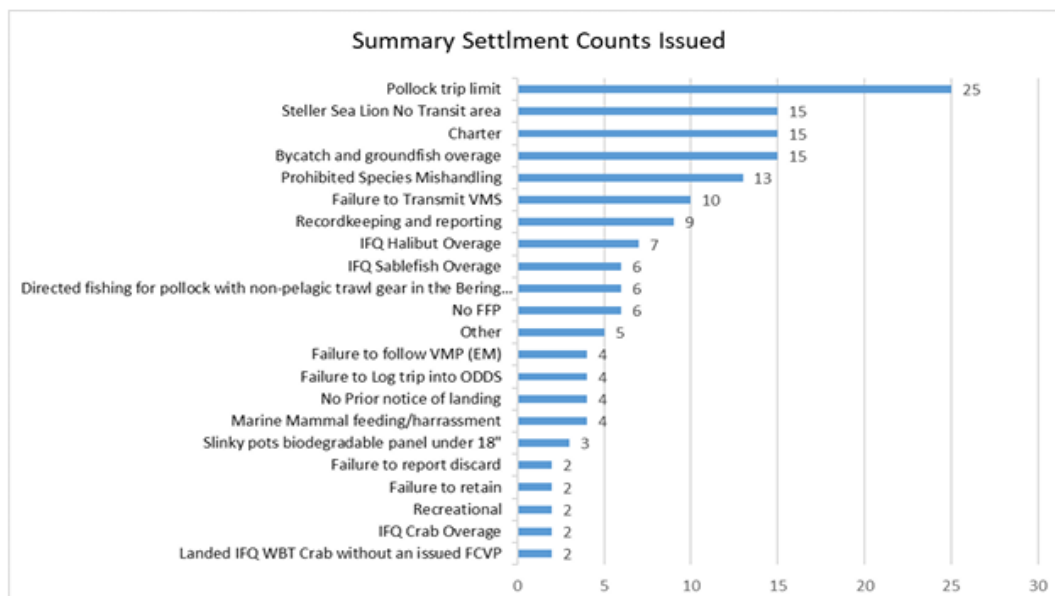
There is a strong enforcement program to deter fisheries violations through successful prosecution and deterrent penalties. NOAA has authority and responsibility under more than 30 federal statutes to manage sustainable fisheries, and to protect living marine resources, including marine areas and species (NOAA Policy for Assessment of Penalties and Permit Sanctions – June 24, 2019, 63pp). Officers and agents in the NOAA Office of Law Enforcement, the US Coast Guard, Customs and Border Protection, Immigration and Customs Enforcement, US Fish and Wildlife Service, and State officers authorized under Cooperative Enforcement Agreements, monitor compliance and investigate potential violations of the statutes and regulations enforced by NOAA.

The Code of Federal Regulations list the sanctions to deal with non-compliance. Penalties for fisheries related violations include fines; permit cancellations or suspensions, permanent prohibitions on participation in the fishery, 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.

OLE agents/officers have the option to provide a written warning for minor offences however, these are taken into account for repeat offenders. More serious offences can be dealt with by a summary settlement, i.e. a violation which is not contested and results in a ticket which may include a discounted fine, thus allowing the violator to quickly resolve the case without incurring legal expenses. Thereafter, an offence is referred to NOAA's Office of General Counsel (OGC) for Enforcement and Litigation which can impose a sanction on the vessels permit or further refer the case to the US Attorney's Office for criminal proceedings. Penalties may range from severe monetary fines, forfeiture of catch, boat seizure and/or imprisonment. The MSA has an enforcement policy section (50 CFR 600.740) that details these "remedies for violations" (MSA, 2007) **(SC 11.1; 11.2; 11.3)**

In the OLE Alaska Enforcement Division Report to NPFMC (December 2023), efforts were highlighted on the nonpelagic trawl operation. 43 trawl vessels were boarded, 29 trawl gear inspections were completed, 44 incidents/investigations were opened, and enforcement actions were taken in five investigations. Subsequent to the reported time in the June report, in the BSAI Red King Crab Savings Area, 34 more trips were monitored (total 738), and in the Gulf of Alaska 23 more (total 123) (NOAA, 2023c).

From October 1, 2022, to September 30, 2023, NOAA officers opened 1,544 incidents including 931 MSA, 454 Northern Pacific Halibut Act, 84 Marine Mammal Protection Act, 65 Endangered Species Act, and 10 involving other statutes and regulations (Lacey Act, Pacific Salmon Fishing Act, Port State Measure Act, and Whaling Convention Act, etc. The following figure shows the summary settlement issued.



**Other includes counts of two or fewer related to chunked halibut, IFQ permit holder not present, selling sport caught halibut, and discarding unsorted pollock catch.*

Figure 12 Summary Settlement Counts Issued. Source: OLE Report to NPFMC, December 2023

Based on this information, there is evidence that sanctions are consistently applied.

However, also in the 2023 OLE report to the Council, there are several Notices of Violation and Assessment (NOVA). Out of 15 NOVAs listed, at least 3 of those incidents could be directly related to the vessels/companies in the UoCs for this fishery. The relevant incidents are as follows:

AK2000930; F/V America's Finest and F/V U.S. Intrepid – Owner Fishermen's Finest, Inc. was charged under the Frank Lobiondo Coast Guard Authorization Act of 2018 with exceeding mothership processing caps of Flathead sole, Yellowfin sole, and Alaska plaice. A \$48,183 NOVA was issued, and the case settled for \$47,183.

AK2205725; C/P Cape Horn - Owner Cape Horn Vessel, LLC and operator Peter Pack were charged jointly and severally under the Magnuson-Stevens Act with fishing in a closed area. A \$26,801 NOVA was issued.

AK2106551; C/P Cape Horn – Crewman Ata loapo was charged under the Magnuson-Stevens Act with sexually harassing a female fisheries observer. A \$24,000 NOVA was issued.

Overall, the OLE report notes trends across all fleets, including those in the UoC and those trends are declining (2023 OLE) A note was included for the violations in the OLE report that, *“Though the statements in this category generally increased over the 4 years, the unique incidents with dispositions of Compliance Assistance decreased from 2019 to 2020, then held relatively steady through 2022, while the number of total actions decreased by more than half. Cases forwarded to GCES remained steady “and “Statements, and statements resulting in Compliance Assistance, dropped in this management program as well following 2019.”* (OLE, 2023).

The client representative stated that the Alaska Seafood Cooperative (AKSC) staff meets with OLE quarterly to discuss trends in observer statements. These trends are communicated to the fleet and vessel ownership. Evidence of these meetings was provided to the assessment team. Additionally, OLE attends the annual AKSC captains' meeting and describes enforcement-related issues from the previous year so that vessel leadership can address them in the subsequent season. While OLE communicates trends they see to AKSC staff and members, specific enforcement actions are dealt with at the company level. Any OLE investigations are held confidential until they are completed and/or settled under the NOVA process, at which time they are included in the annual enforcement report. OLE stated that it was only allowed to discuss enforcement actions/issues with the company, however the clients were able to provide additional evidence in terms of the infractions listed in the December 2023 enforcement report. It was noted at the ACDR stage that “additional internal processes are in place to communicate to crew fishery management regulations and the important role of observers.” (Personal communication, Jason Anderson, AKSC client representative). During the site visit, representatives from the various companies that operate under the AKSC confirmed that violations/infractions are handled at the company level. Frank O'hara, the O'hara Corporation, reviewed protocols for their company regarding infractions, and Glenn Merrill, the Director of Government Affairs for North Star Fishing Company (the parent company for the F/V Cape Horn), provided excerpts of the Employee Handbook, that addresses non-discrimination policies, anti-harassment policies, non-retaliation policies, complaint procedures and corrective action. All new hires sign several documents as part of the onboarding process including the handbook. Returning crew re-sign all these documents annually. It was also noted that the AKSC have partnered with OLE to hold the observer training for the key crew. This training has been completed for the last several years prior to the start of the 'A Season' fishery, that begins on January 20. Meeting details were provided to the assessment team as evidence of the protocols in place and that the trainings occur with regular frequency. In addition to OLE providing observer training, an anti-harassment training for their supervisors was given by their employment law attorney.

It should be noted that the F/V Cape Horn no longer fishes and the person cited for the violations is no longer employed with the company. It should also be noted that by the time violations are listed in a Council report, they may be old or outdated. Regarding the infraction for F/V America's Finest and F/V U.S. Intrepid – Owner Fishermen's Finest, Inc. and notice of being charged under the Frank Lobiondo Coast Guard Authorization Act of 2018 for exceeding mothership processing caps, this is very specific legislation that is applicable to that company and is not incorporated within the cooperative's agreements. Sections 835 and 836 of the Public Law 115-282 was provided and further describes the specific limitations applicable to just that company.

Based on the evidence provided regarding company protocols, OLE trainings and the overall decline in trends noted in the December 2023 enforcement report, evidence exists that sanctions are consistently applied and thought to provide effective deterrence.

Regarding IUU fishing, the Report to Congress, *Report of the Maritime Security and Fisheries Enforcement Act Interagency Working Group on IUU Fishing Regarding Efforts to Investigate, Enforce, and Prosecute Illegal, Unreported and Unregulated Fishing in 2022* lists in summary settlements, fines and violations specifically related to IUU fishing.²¹ (SC 11.1; 11.2; 11.3)

²¹ <https://www.fisheries.noaa.gov/s3/2024-06/2024-MSAFE-Report-Final.pdf>

Evaluation Parameter Rationale - Process	Met? (Yes/No)
11.1 <i>The system of States laws is of adequate severity to provide for effective sanctions.</i>	Yes
11.2 <i>The system of sanctions in place is sufficiently severe to deter violations and illegal activities. The system shall be considered adequate in severity if the potential sanctions include fines, suspension or withdrawal of permission to fish, and confiscation of catch or equipment.</i>	Yes
11.3 <i>The system of sanctions in place are of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. This may include the adoption of a civil sanction regime based on an administrative penalty scheme. The fisheries management organization also ensures the consistent and transparent application of sanctions.</i>	Yes
11.4 <i>If applicable, the system of enforcement measures is effective for foreign vessels fishing in the State's EEZ or for its vessels fishing in high seas or in another State's EEZ.</i>	NA
<p>Rationale: Evidence of the effectiveness of the sanctions can be seen in the enforcement reports. No IUU fishing was reported in the December OLE report to the Council. NOAA Fisheries also provides annual reports to Congress about the Working Group's efforts, pursuant to Maritime Security and Fisheries Enforcement Act, 2019, to investigate, enforce and prosecute groups and individuals engaging in IUU fishing. The most recent Report To Congress from 2022 shows penalties issued, fines and settlements settled, but none directly applicable to this fishery.</p>	

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No/NA)
11.1 <i>There is evidence to substantiate that States laws are of adequate severity to provide for effective sanctions. The evidence here includes largely (a) whether laws set out effective penalty provisions and the courts respond in a manner that deters further or repeat offenses, (b) the views of the industry, other stakeholders, and the general public, and (c) the outcomes and associated trends of the enforcement efforts when measured against appropriate performance indicators.</i>	Yes
11.2 <i>There is evidence to substantiate that sanctions for violations of regulations (e.g., suspension, withdrawal, or refusals of fishing permit or of the right to fish) are adequate in severity to secure compliance and discourage violations.</i>	Yes
11.3 <i>There is evidence to substantiate that sanctions for violations of regulations are of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. Sanctions are applied transparently and consistently across the board.</i>	Yes
11.4 <i>There is evidence to substantiate enforcement action in these cases (i.e., boarding, violations).</i>	NA
<p>Rationale: The December 2023 OLE report to the Council provides evidence of enforcement actions and effective sanctions for violations. As noted in the rationale above, the total actions decreased by more than half and there were not any repeat offenses listed in the report. Additionally, the client group meets with the Office of Law Enforcement to discuss trends in observer statements and any violations or infractions received. This is then communicated with the fleet and vessel owners to reduce the risk of repeat infractions. Evidence was provided to the assessment team on these trainings with the client and OLE.</p>	

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No/NA)
11.1 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States laws of adequate severity are in place that provide for effective sanctions. Examples may include various laws, regulations, and other data or reports.</i>	Yes
11.2 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that sanctions applicable in respect of violations and illegal activities are adequate in severity to be effective in securing compliance and discouraging violations wherever they occur. Sanctions are in force that affects authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures. Examples may include various laws, regulations, and other data or reports.</i>	Yes
11.3 <i>The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fisheries management organization ensures that sanctions for IUU fishing by vessels and, to the greatest extent possible, nationals under its jurisdiction are of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. This may include the adoption of a civil sanction regime based on</i>	Yes

<i>an administrative penalty scheme. The fisheries management organization also ensures the consistent and transparent application of sanctions. Examples may include various laws, regulations, and other data or reports.</i>	
<i>11.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that flag States take enforcement measures with fishing vessels entitled to fly their flag if the vessels have been found by the State to have contravened applicable conservation and management measures. These enforcement measures will include, where appropriate, making the contravention of such measures an offense under national legislation. Examples may include various laws, regulations, and other data or enforcements reports.</i>	NA
<p>Rationale: The rationale provided above details the evidence and effectiveness of the sanctions in place. Please see the following references for further details. National Oceanic and Atmospheric Administration (NOAA). (2023c). <i>Office of Law Enforcement Alaska Division: Report to North Pacific Fishery Management Council</i>. December 2023. https://meetings.npfmc.org/CommentReview/DownloadFile?p=475936fa-58f5-4403-b98a-21a19244e4ef.pdf&fileName=B4%20OLE%20Report.pdf</p> <p>NOAA (2022). Report to Congress, <i>Report of the Maritime Security and Fisheries Enforcement Act Interagency Working Group on IUU Fishing Regarding Efforts to Investigate, Enforce, and Prosecute Illegal, Unreported and Unregulated Fishing in 2022</i>. https://www.fisheries.noaa.gov/s3/2024-06/2024-MSAFE-Report-Final.pdf</p>	

Numerical score:	Starting score	- (Number of EPs NOT met x 3)	=	Overall score
	10	0		10
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)				High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)				Full Conformance
Non-conformance Number (if applicable):				NA

Fundamental Clause 12

Considerations of fishery interactions and effects on the ecosystem shall be based on the best scientific evidence available, local knowledge where it can be objectively verified, and a risk assessment-based management approach for determining most probable adverse impacts. Adverse impacts of the fishery on the ecosystem shall be appropriately assessed and effectively addressed.

Supporting Clause	Met? (Yes, No)			Score	
	EP Process	EP Status	EP Evidence basis		
12.1	<i>The fishery management organization shall assess the impacts of environmental factors on target stocks and associated or dependent species in the same ecosystem, and the relationship among the populations in the ecosystem.</i>	Yes	Yes	Yes	10
Rationale	Ecosystem Status Reports are produced annually to compile and summarize information about the status of the Alaska marine ecosystems for the North Pacific Fishery Management Council, the scientific community and the public. As of 2016, there are separate reports for the Eastern Bering Sea (EBS), Aleutian Islands (AI), the Gulf of Alaska (GOA), and Arctic (forthcoming) ecosystems. These reports include ecosystem report cards, ecosystem assessments, and ecosystem and ecosystem-				

	<p>based management indicators that together provide context for ecosystem-based fisheries management in Alaska.</p> <p>Process: There is an annual process for updating and producing the ecosystem status reports, and using them when compiling the SAFE documents, which link ecosystem indicators directly to groundfish stock abundance, status, trends and threats. There is also an ongoing process to activate the fishery ecosystem plan, and take into consideration emerging issues such as climate change which are likely impacting or will impact the fisheries. For example, The Council convened a two-day Climate Scenarios Workshop on Wednesday, June 5 and Thursday, June 6, 2024. The purpose was to generate ideas for short- and long-term management approaches to improve climate resiliency of federally managed fisheries in the North Pacific. The workshop included over 200 in-person and virtual participants.</p> <p>The workshop included case studies of climate change impacts in Alaska fisheries, and examples of ongoing work by the Council, NMFS, and communities to build climate readiness and support adaptation. The main focus of the workshop was a set of four hypothetical future scenarios that described varying degrees of climate change impacts that could be experienced in the future, as well as a range of ecosystem-based management approaches that could be practiced by the Council. Participants explored these hypothetical scenarios through small group breakout sessions. This EP is met.</p> <p>Current status / Appropriateness / Effectiveness: The annual Ecosystem Status Reports provide evidence that assessments are conducted to determine the impacts of environmental factors on target and associated species as well as relationships among these species. The reports are done separately for each major ecosystem in the Alaska region (EBS, AI, and GOA - soon to also include Arctic) which provides sufficient detail to monitor and allow informed management of the fisheries.</p> <p>Evidence: Annual ecosystem status reports provide the required evidence. They are accessible here: https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands. At this link there is also an interactive tool available to help visualize the ecosystem status in each area, along with a “report card” on ecosystem health. Scientists at the Alaska Fisheries Science Center have begun exploring quantitative linkages among Report Card indicators, illustrating how changes in one variable might affect another (i.e., which indicators are stronger/weaker determinants of trends in other ecosystem components). The method used is dynamic structural equation modeling (DSEM), which can also project next year values and can therefore be used as a tool alongside the Spring PEEC (Preview of Ecosystem and Economic Conditions) meeting to identify emergent trends and potential noteworthy topics to track through summer surveys and research efforts.</p> <p>Understanding ecosystem structure and function usually begins by organizing indicators within a simplified conceptual model, such that ecological relationships among indicators can be expressed, visualized, and discussed. One simplified approach to visualize relationships among variables is a qualitative network model (QNM) (Levins, 1974). QNMs summarize the relationship among multiple variables (represented as boxes) that are linked by hypothesized mechanisms (represented as arrows), where mechanisms are specified as a positive or negative impact of one variable on another. QNMs have been successfully used at the Alaska Fisheries Science Center to identify likely consequences of hypothetical ecosystem changes (Reum et al., 2015, 2021) and can incorporate stakeholder input regarding relevant variables (boxes) and mechanisms (arrows).</p>	
<p>12.2</p>	<p><i>The most probable adverse impacts from human activities, including fishery effects on the ecosystem/environment, shall be assessed and, where appropriate, addressed and or/corrected, taking into account available scientific information and local knowledge. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full consideration should be given to the special circumstances and requirements in developing fisheries, including financial and technical assistance, technology transfer, training, and scientific cooperation. In the absence of</i></p>	<p>N/A</p> <p>Clause 12.2 is a summary clause and as such does not need to be scored. The 12.2 sub-clauses will instead provide the specific elements that need to be scored.</p>

	<i>specific information on the ecosystem impacts of fishing on the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk, the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures.</i>				
12.2.1	<i>The fishery management organization shall consider the most probable adverse impacts of the unit of certification on main associated species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) shall be monitored and shall not threaten these non-target species with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action shall be taken.</i>	Yes	Yes	Yes	10
12.2.2	<i>The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) shall be monitored and shall not threaten these non-target species with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action shall be taken.</i>	Yes	Yes	Yes	10
12.2.3	<i>There shall be outcome indicator(s) consistent with achieving management objectives for non-target species (i.e., avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).</i>	Yes	Yes	Yes	10
Rationale	<p>See section 4.6 for tables showing catches of main and minor associated species in these fisheries, as well as Prohibited Species Catch (PSC) numbers (classified as “bycatch” rather than ETP because these stocks do not qualify as ETP). There is a common rationale for justifying EP scores for 12.2.1-12.2.3 for Process, Status, and Evidence EPs, provided here.</p> <p>Process: The UoC in this assessment has no main associated species, as the bulk of the landings are the flatfish species under assessment. There are several minor associated species, all of which are managed as part of the BSAI or GOA groundfish FMPs (Alaska skate, starry flounder, turbot in the BSAI and POP, sablefish, big skate, butter sole, longnose skate, dusky rockfish and English sole in the GOA). Of these, GOA POP, dusky rockfish and sablefish are all separately RFM certified. The annual harvest specifications process for groundfish in the BSAI and GOA meets this EP because it includes a process to establish “outcome indicators,” in this case reference points, which are precautionary and based on annual stock assessments, and then sets allowable harvests to ensure the stock stays above the target reference point. If the stock is below the target reference point (TRP) (B_{40%} and B_{35%}), the harvest control rules mandate a reduction in allowable catch designed to enable the stocks to rebuild.</p> <p>Status: There are no main associated species. All minor associated species are managed under the groundfish FMP, and stocks are healthy. POP, sablefish, and dusky rockfish are all separately RFM</p>				

	<p>certified with no stock status issues. Other associated species may be “ecosystem component” species and monitored to ensure there is no change in abundance or other factor that may require them to be reclassified as “in the fishery.” These species are not commercially targeted.</p> <p>Evidence:</p> <p>These fisheries have full observer or EM coverage, and managed groundfish stocks receive regular quantitative stock assessments with reference points (<i>outcome indicators</i>) and allowable harvests are based on clear control rules and are actively monitored. Some species that are not part of the fishery FMP are considered as “ecosystem component” and managed less intensively because they are not targeted. Nevertheless, monitoring of removals is complete, and there are clear triggers for re-evaluation of the stock as “in the fishery” or “ecosystem component.” In summary, excellent information on fishery removals, combined with fishery independent abundance surveys and quantitative stock assessments means that the evidence EP is fully met for associated species.</p>				
12.2.4	<p><i>The fishery management organization shall consider the most probable adverse impacts of the unit of certification on ETP species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.</i></p>	Yes	Yes	Yes	10
12.2.5	<p><i>There shall be outcome indicator(s) consistent with achieving management objectives seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and any associated enhanced fishery activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.</i></p>	Yes	Yes	Yes	10
Rationale	<p>The rationale for 12.2.4 and 12.2.5 is combined because the justification for the three EPs is the same for both (concerning ETP species).</p> <p>Process: The ESA (United States 1983), signed on 1973, provides for the conservation of species that are endangered or threatened and the conservation of the ecosystems on which they depend. NOAA has jurisdiction over endangered and threatened marine species and works with the U.S. Fish and Wildlife Service (USFWS) to manage ESA-listed species. Generally, NOAA manages marine species, while USFWS manages land and freshwater species.</p> <p>Section 4(f) ESA directs NOAA’s National Marine Fisheries Service (NMFS) to develop and implement recovery plans for threatened and endangered species. NMFS Office of Law Enforcement works with the U.S. Coast Guard and other partners to enforce and prosecute ESA violations (NOAA).</p> <p>Recovery plans for ESA-listed species must include: (1) a description of site-specific management actions necessary to conserve the species or populations; (2) objective, measurable criteria which, when met, will allow the species or populations to be removed from the endangered and threatened species list; and (3) estimates of the time and funding required to achieve the plan’s goals. Each ESA-listed species has a recovery plan, and regular updates on progress toward recovery. ESA-listed seabirds also have <i>outcome indicators</i> normally contained within Biological Opinions and concomitant Incidental Take Statements. These documents provide the conditions under which “takes” of ESA-listed species can occur in commercial fisheries and what happens if these allowable takes are exceeded. None of the UoC fisheries have reported mortalities of ESA or ACAP seabirds.</p> <p>Marine mammals that are not ESA listed are protected under the Marine Mammal Protection Act (MMPA) which also has a process in place to carry out population assessments and establish PBRs (“outcome indicators”) and commensurate take limits in commercial fisheries that may cause them serious injury or mortality. The outcome indicators can change based on the level of certainty regarding population status and trends as well as fishery interactions and is biased precautionary in the absence of recent information or other source of uncertainty such as population structure. The</p>				

	<p>MMPA also establishes a process for take reduction action should the take exceed the prescribed limits. This EP is fully met.</p> <p>Current status / Appropriateness / Effectiveness: Section 4.6 of this report provides details on the status of relevant ETP populations. Most are considered “not strategic” meaning total takes are well below PBR, and fishery takes are below 10% of PBR. Where these populations are considered “depleted” due to ESA listing status, the fisheries in this assessment (and all fisheries combined) are well within PBR limits, thus this EP is met.</p> <p>Evidence basis: For marine mammals, regular population abundance surveys are carried out, or indicators of population health such as pup count or nesting success are monitored, and, for mammals, this information is fed into Stock Assessment Reports (e.g. Muto et. al 2021 and Young et. al. 2023). These reports provide conservative PBRs, and estimates of fishery and other causes of mortality. The UoC fisheries are monitored with 100% observer or EM coverage, and all takes are recorded. This EP is met.</p>				
12.2.6	<p><i>The fishery management organization shall consider the most probable adverse impacts of the unit of certification on habitats, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.</i></p>	Yes	Yes	Yes	10
12.2.7	<p><i>There shall be knowledge of the essential habitats for the stock under consideration and potential fishery impacts on them. Impacts on essential habitats, and on habitats that are highly vulnerable to damage by the fishing gear involved, shall be avoided, minimized, or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat shall be considered, not just the part of the spatial range that is potentially affected by fishing.</i></p>	Yes	Yes	Yes	10
12.2.8	<p><i>There shall be outcome indicator(s) consistent with achieving management objectives for avoiding, minimizing, or mitigating the impacts of the unit of certification on essential habitats for the stock under consideration and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.</i></p>	Yes	Yes	Yes	10
Rationale	<p>The rationales for subclauses 12.2.6, 12.2.7 and 12.2.8 are grouped because justifications for meeting each EP are very similar and overlapping for all subclauses pertaining to habitat.</p> <p>Process:</p> <p>The MSA 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”. Councils are also required to give special attention to HAPCs. Each Council FMP contains provisions for a review of EFH issues every five years. The latest review was carried out in 2015, and a new review was announced in April 2022. EFH information is also reviewed annually in the “Ecosystems Considerations” section of SAFE reports.</p> <p>As part of the 2015 review, EFHs throughout the EBS, AI, and GOA (i.e., the full spatial range) have been modelled for all major species of groundfish and invertebrates based on available information on distributions of eggs, larvae, juveniles, and adults. This information is principally derived from bottom trawl surveys and commercial catch data. This allows the model to predict distributions of EFHs based on percentile distributions of the species abundance. Fishing effects were then added to the model based on existing literature of effects on sediment types and recovery times. This allows prediction on</p>				

a monthly basis of the extent of impact and recovery on a 5x5m grid. The model specifically includes long-lived species on deep and rocky habitats.

The assessment of impacts first considers whether the stock is above its limit reference point. Mitigation measures would be recommended for any stock below its limit reference point if reductions in EFH are identified as a cause of stock depletion. The next criterion is whether the Cumulative Effects Assessment (CEA) is reduced for each species and life stage. (CEA is generally taken as the 50% quantile threshold of suitable habitat.) If >10% of the CEA is impacted, further analyses are required by stock assessment authors to determine whether there is a significant correlation with life history parameters for the stock to determine any plausible stock effects. Any plausible effects would be investigated by Plan Teams and SSC; if more than minimal and not temporary, these would result in mitigation measures being recommended to the Council. This would result in the Council following its FMP amendment process to mitigate adverse effects. HAPCs are sub-sites with important ecological functions or are especially vulnerable to human impacts, and are identified to or by the Council according to set priorities (e.g., coral beds, seamounts, skate habitat).

There is a well-defined process in place to model the extent of EFH for each major species and to evaluate, according to set criteria, the effects of fishing. Where such effects may be appreciated, a process to evaluate and mitigate is in place within the Council. An alternative process is in place to identify priority HAPC and to evaluate and protect them. These processes specifically include the effects of trawl fisheries. The information provided by the EFH model may be used to produce and test management measures designed to avoid significant adverse effects. Both scientific trawl survey and commercial catch data are used to inform the model.

Habitat essential to endangered species is identified according to regulatory requirements (ESA and MMPA). NOAA Fisheries has designated critical habitat for Steller sea lions in the Aleutian Islands (see Clause 12.2.4). All fisheries operating in BSAI and GOA must abide by these closed areas, ensuring that cumulative impacts are minimal.

Current Status/Appropriateness/Effectiveness:

Several HAPCs are identified throughout the EBS, AI, and GOA – Alaska Seamounts, Bowers Ridge, GOA Coral Habitat, GOA Slope Habitat (bottom contact gear prohibited or restricted), and skate nursery areas (monitoring priority areas). Figure 9 shows HAPCs and other habitat closures in Alaska waters. All BSAI and GOA certified fisheries must abide by the same area closures, gear limitations, etc., which ensures that cumulative impacts on HAPCs and EFHs are minimal.

In the present UoC fisheries, all target species are above their limit reference points, and none of the groundfish SAFE reports or the FMPs conclude that habitat modification or loss is a concern for these species.

Habitat in the EBS, AI and GOA has been mapped at a level of 5 km² grids, and while this level is likely under sampling habitat, the data provide an idea of what is occurring on the seafloor (Figure 6). Figure 6, Figure 7, and Figure 8 show the percentage of area within each grid cell that has been disturbed (2003-2017) for BS, AI, and GOA, respectively. Figure 5 shows a high occurrence of mud and sand and lesser amounts of gravel, cobble, and boulders.

Therefore, it can be concluded that the relevant habitats are not affected substantively by these commercial fisheries and this EP is met.

As stated above, several HAPCs are identified throughout the EBS, AI, and GOA – Alaska Seamounts, Bowers Ridge, GOA Coral Habitat, GOA Slope Habitat (bottom contact gear prohibited or restricted), and skate nursery areas (monitoring priority areas). The status EP is met for all subclauses.

Evidence Basis:

FMPs and calls for nominations of HAPC and EFH reviews and methodologies provide fully adequate information on knowledge of the essential habitats for the “stock under consideration” and potential fishery impacts on them and on habitats that are highly vulnerable to damage by the fishing gear. Information and reports are all publicly available on the NOAA Fisheries and Council websites. The evidence EP is met for all habitat-related subclauses.

12.2.9	<i>The fishery management organization shall consider the most probable adverse impacts of the fishery under assessment on the ecosystem, by assessing and, where appropriate, addressing and or/correcting</i>	Yes	Yes	Yes	10
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	<i>them, taking into account available scientific information and local knowledge.</i>				
12.2.10	<i>There shall be outcome indicator(s) consistent with achieving management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhanced activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration must be reversible and not cause serious or irreversible harm to the natural ecosystem’s structure, processes, and function.</i>	Yes	Yes	Yes	10
12.2.11	<i>The fishery management organization shall consider the most probable adverse human impacts on the stock/ecosystem under consideration, by assessing and, where appropriate, addressing and or/correcting them, taking into account available scientific information and local knowledge.</i>	Yes	Yes	Yes	10
Rationale	<p>The rationale for the EPs for subclauses 12.2.9, 12.2.10 and 12.2.11. are grouped here because they are very similar and overlapping.</p> <p>Process: Through scientific investigations of NMFS, the PSEIS provides a comprehensive evaluation of the FMPs. The SAFE process evaluates the stock status of the target species on an annual basis, considering major bycatches, effects on prohibited species (i.e., species which cannot be landed and have limits in place on total catches in a fishery sector; these are notably halibut, crab, and salmon), habitat, and a wide-ranging consideration of ecosystem indicators. These evaluations are supported by extensive monitoring programs with specific investigations on issues of concern (such as EFH impacts and impacts on seabirds). The Council has wide-ranging representation from the stakeholder community. In addition, the Groundfish Plan Team, Ecosystem Committee, and the Council meetings are all open to public attendance. Available scientific information is therefore fundamental to the impact evaluation process and is reinforced by information and issues raised by stakeholders throughout the management process.</p> <p>Significant specific information is collected on all appreciable adverse effects of the fishery on the ecosystem, using both specific scientific studies as well as views and information provided by the wider stakeholder community. These are assessed through PSEIS and routinely through the SAFE and the Council processes. Management objectives have been developed in response to these processes.</p> <p>Each major stock is subject to a SAFE assessment, and specific management objectives are developed in response to any new issues arising. In 2014, the Council adopted an Ecosystem Policy, which is considered in all long-term planning initiatives, fishery management actions, and science planning to support ecosystem-based fishery management. The intent is that management explicitly takes “into account environmental variability and uncertainty, changes and trends in climate and oceanographic conditions, fluctuations in productivity for managed species and associated ecosystem components, such as habitats and non-managed species, and relationships between marine species” and incorporates “the best available science, including local and traditional knowledge, and engage scientists, managers, and the public” (NPFMC 2019b).</p> <p>Ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST) model, which is concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock, and arrowtooth flounder. Food-web modelling using Ecopath/Ecosim has been carried out for EBS, AI and GOA, providing predominantly guild-level analyses of cumulative and ecosystem level indicators.</p>				

	<p>The Council approach to groundfish fisheries explicitly includes for ecosystem-based management 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, avoidance of impacts on seabirds and mammals and reduce and avoid impacts to habitats.</p> <p>As for the process to develop and maintain “outcome indicators,” setting precautionary single-species TACs is a good example of this, especially as these can be modified as informed by ecosystem trends that may impact stock abundance. In addition, in the BSAI, the 2 million metric ton optimal yield groundfish catch cap is can be considered as a good ecosystem level reference point or “outcome indicator.” This EP is fully met.</p> <p>Current Status/Appropriateness/Effectiveness: Management measures are in place, based on a sound and fishery-related evidence platforms and extensive evaluations, designed to achieve the stated objectives for relevant ecosystem components. These specifically include marine mammals, seabirds, prohibited species, target and bycatch species, essential fish habitat, HAPCs, and food-web effects. As such, information and objectives are specific to the fishery and/or fishery management system, and use of more generic information is not considered necessary. This EP is met.</p> <p>Evidence Basis: SAFE assessments (including ecosystem indicators and essential fish habitat evaluations) for each species are published annually, together with endangered species management plans, marine mammal monitoring, and management measures. Developments in ecosystem modelling are published in the scientific press and NOAA Fisheries website. All information is readily available through NOAA Fisheries and Council websites. This EP is fully met for these subclauses.</p>				
12.3	<p><i>The role of the stock under consideration in the food web shall be considered, and if it is a key prey species in the ecosystem, management objectives and measures shall be in place to avoid severe adverse impacts on dependent predators.</i></p> <table border="1" data-bbox="839 1021 1489 1238"> <tr> <td data-bbox="839 1021 991 1238">Yes</td> <td data-bbox="991 1021 1137 1238">Yes</td> <td data-bbox="1137 1021 1315 1238">Yes</td> <td data-bbox="1315 1021 1489 1238">10</td> </tr> </table>	Yes	Yes	Yes	10
Yes	Yes	Yes	10		
12.4	<p><i>There shall be outcome indicator(s) consistent with achieving management objectives seeking to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species.</i></p> <p>Not applicable as none of the target stocks are key prey species in these ecosystems.</p>				
Rationale	<p>Process:</p> <p>The role of each stock in the food web is specifically considered in the EBS, AI, and GOA systems. This includes specific monitoring and evaluation of ecosystem interactions, notably through the ecosystem indicators reported to the stock assessment authors and considered at the Plan Team, SSC and Council deliberations. These indicators include physical conditions and prey and predator indicators, such as mesozooplankton, copepod size, capelin populations, and apex fish biomass.</p> <p>In addition, ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST) model, which is concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock, and arrowtooth flounder. Food-web modelling using Ecopath/Ecosim has been carried out for EBS, AI, and GOA, providing predominantly guild-level analyses of cumulative and ecosystem level indicators. The CEATTLE model combines predation between cod, pollock, and arrowtooth flounder inter- and intraspecies predation with climatic effects, aiming to develop reference points in relation to prevailing climatic conditions and multi-species ABCs. Though only relevant to the arrowtooth flounder target species in this assessment, this demonstrates that there are mechanisms in place by which the role in the food web of groundfish stocks like the stocks under consideration, are assessed and monitored. These are not key prey species thus there are no required management objectives relating to minimizing impacts to dependent predators. This EP is fully met.</p>				

	<p>Current Status/Appropriateness/Effectiveness:</p> <p>The development of ecosystem indicators and models and the incorporation of these into stock assessments and Plan Team, SSC, and the Council evaluation process allow for the ongoing development of management measures to achieve the management objectives. These may include precautionary adjustments of TACs and designation of essential habitat for mammalian predators if required. This EP is met.</p> <p>Evidence Basis:</p> <p>The ecosystem indicators and other ecosystem modelling information used in the SAFE assessments, endangered species management plans, and the outcomes of SSC and Council evaluations are all publicly available on the NMFS and Council websites.</p>				
12.5	<p><i>States shall introduce and enforce laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).</i></p>	Yes	Yes	Yes	10
Rationale:	<p>MARPOL 73/78 consists of six separate Annexes, each set out regulations covering the various sources of ship-generated pollution. Annex I and II are mandatory for all signatory nations to MARPOL while Annexes III, IV, V and VI are optional.</p> <p>Process: Currently, the U.S. is signatory to Annexes I, II, III, V and VI. Annexes I, II, V and VI have been incorporated into U.S. law by the Act to Prevent Pollution from Ships (APPS) and implemented within 33 USC 1901 and 33 CFR 151. The U.S. incorporates Annex III by the Hazardous Materials Transportation Act (HMTA) implemented within 46 USC 2101 and 49 CFR 171 -174 and 176. Although the U.S. has not ratified Annex IV, the U.S. has equivalent regulations for the treatment and discharge standards of shipboard sewage – the Federal Water Pollution Control Act (FWPCA) as amended by the Clean Water Act and implemented by 33 USC 1251 and 33 CFR 159.</p> <p>Outcome/Status: The regulations implemented by the US Coast Guard and in the Federal Register directly incorporate the relevant annexes to which the US is signatory. The US Coast Guard has authority to enforce these regulations and has developed guidance and policies enabling them to do so. For example, CG-3PV Policy Letter 06-09 instructs Coast Guard officers in the correct enforcement of MARPOL Annex I, related to oil pollution from ships (USCG 2006).</p> <p>Evidence basis: As above, there is a direct link between the MARPOL treaty and its mandatory annexes for signatories, and the implementing legislation within the US government. This is fully and transparently documented, and available from the US Coast Guard on the internet, here: https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Commercial-Vessel-Compliance/Domestic-Compliance-Division/MARPOL/.</p>				
12.6	<p><i>Research shall be promoted on the environmental and social impacts of fishing gear especially the impact of such gear on biodiversity and coastal fishing communities.</i></p>	Yes	Yes	Yes	10
Rationale	<p>The NPFMC maintains a list of research priorities which are periodically reshuffled to reflect the changing importance of different impacts of fisheries. The current top twelve research priorities for 2024-2028 include:</p> <ul style="list-style-type: none"> • Research to reduce western Alaska salmon bycatch in the Bering Sea groundfish fisheries, which has a direct link to coastal fishing communities dependent on shrinking salmon runs returning to their rivers. • An explicit priority to examine the economic , social and culture effects of fisheries and fishery management policy on communities over time, including impacts from fishery policy changes and tribal citizen and tribal nation reliance on, participation in and impacts of federally managed fisheries. 				

	<ul style="list-style-type: none"> A priority to develop predictive tools and models that evaluate the impact of multiple projected climate scenarios on managed resources to inform management options related to ecosystem production and resilience and adaptation of fishing communities <p>Process: The NPFMC process to establish research priorities which include research into environmental and social impacts of fishing on biodiversity and coastal communities meets this EP.</p> <p>Status: There is evidence for this research (see above), and it is considered appropriate for overall fisheries management purposes. This EP is met.</p> <p>Evidence: The evidence (e.g. the published list of research priorities arising from the Council process available here, among other places: https://www.npfmc.org/june-2024-newsletter/) is sufficient to substantiate that research is promoted on the abovementioned issues and impacts. This EP is met.</p>				
12.7	<p><i>The fishery management organization shall make use, where appropriate, of Marine Protected Areas (MPAs). The general objectives for establishing MPAs shall include ensuring sustainability of fish stocks and fisheries, and protecting marine biodiversity and critical habitats.</i></p>	Yes	Yes	Yes	10
Rationale	<p>Process:</p> <p>The MSA 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”. Councils are also required to give special attention to HAPCs. Each Council FMP contains provisions for a review of EFH issues every five years. Under the MSA, the Council is required to prepare and submit an FMP to the secretary of Commerce for approval for each fishery under its authority that is considered to require conservation and management. In so doing, the FMPs must be consistent with ten national standards for fishery conservation and management (16 USC § 1851).</p> <p>The latest EFH review developed a hierarchical impact assessment methodology to operationalize the “more than minimal and not temporary” criterion. This is based on the model of EFH impact and recovery outlined earlier. Stock assessment authors are required to determine whether the population under assessment is above or below its limit reference point. For stocks at this level, mitigation measures would be required if the stock assessment author determines that there is a plausible connection to reductions in EFH. The next question is whether the CEA (defined as the 50% quantile of EFH) is disturbed by fishing. If so, then stock assessment authors must determine whether critical life-history characteristics of the stock are correlated with the proportion of CEA affected. If correlations suggest a plausible stock effect, plan teams and SSC will consider appropriate mitigation measures to recommend to the Council.</p> <p>HAPCs are designated following a nomination process according to 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.</p> <p>The mechanisms developed to identify significant effects on EFH and for identifying HAPC are considered consistent with achieving management objectives for avoidance, minimization, or mitigation of impacts on essential habitats for the “stock under consideration” and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. This is further supported by habitat ecosystem indicators considered as part of the SAFE process. The process EP is met.</p> <p>Current Status/Appropriateness/Effectiveness:</p> <p>The Council has in place groundfish FMPs in the BSAI and GOA that include the AK flatfish fisheries. Within these FMPs, there is a management and policy objective to reduce and avoid impacts to habitat, specifically regarding marine protected areas:</p> <ul style="list-style-type: none"> Develop a marine protected area policy in coordination with national and state policies. 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. 				

<ul style="list-style-type: none"> • Implement marine protected areas if and where appropriate. <p>Several HAPCs are identified throughout the EBS, AI, and GOA – Alaska Seamounts, Bowers Ridge, GOA Coral Habitat, GOA Slope Habitat (bottom contact gear prohibited or restricted), and skate nursery areas (monitoring priority areas). Figure 29 shows HAPC and other habitat closures in Alaska waters. All BSAI and GOA certified fisheries must abide by the same area closures, gear limitations, etc., which ensures that cumulative impacts on HAPCs and EFHs are minimal.</p> <p>Evidence Basis:</p> <p>MPAs cover 26% of U.S. waters, including many within the Alaska EEZ (https://marineprotectedareas.noaa.gov/). The Council's FMPs outline the consideration and implementation of MPAs. Research on EFH and bottom habitat in the BSAI and GOA carried out by the Alaska Fisheries Science Center and others is of high quality and applicability.</p>
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Evaluation Parameter Rationale - Process	Met? (Yes/No)
12.1 <i>There is a process that allows assessment and monitoring of environmental factors (e.g., climatic, oceanographic) on target and associated species in the same ecosystem, and that assess the relationships between species in the ecosystem.</i>	Yes
12.2 <i>None – this is a summary clause and is not scored.</i>	N/A
12.2.1 <i>There is a process that accounts for the most probable adverse impacts of the unit of certification on main associated species. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on such impacts of fishing for the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk, the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures. If information has been utilized from generic evidence based on similar fishery situations, then, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP or bycatch of non-target fishery resources (or nontarget stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.</i>	Yes
12.2.2 <i>There is a process that accounts for the most probable adverse impacts of the unit of certification on minor associated species. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on such impacts of fishing for the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures. If information has been utilized from generic evidence based on similar fishery situations (proxies), then, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP or bycatch of non-target fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.</i>	Yes
12.2.3 <i>There is a process to set outcome indicator(s) consistent with achieving management objectives for non-target species (i.e., avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).</i>	Yes
12.2.4 <i>There is a process that accounts for the most probable adverse impacts of the unit of certification on ETP species. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on such impacts of fishing for the unit of certification, generic evidence based on similar fishery situations (proxies) can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures. If information has been utilized from generic evidence based on similar fishery situations, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the</i>	Yes

<p><i>following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP or bycatch of non-target fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.</i></p>	
<p><i>12.2.5 There is a process in place that allowing creation of effective outcome indicators seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and any associated enhanced fishery activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.</i></p>	Yes
<p><i>12.2.6 There is a process that accounts for the most probable adverse impacts of the unit of certification on habitats. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on such impacts of fishing for the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures. If information has been utilized from generic evidence based on similar fishery situations, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP species or bycatch of non-target fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.</i></p>	Yes
<p><i>12.2.7 There is a mechanism in place by which the potential impacts of the fishery upon habitats essential to the stock under consideration and on habitats that are highly vulnerable to damage are identified. This or a similar mechanism shall also be in place to identify habitats that are highly vulnerable to fishery activities by the unit of certification. The information provided by these mechanisms shall be used to produce specific management objectives related to avoiding significant adverse impacts on habitats. The knowledge of the habitats in question can therefore include relevant traditional, fisher, or community knowledge, provided its validity can be objectively verified (i.e., the knowledge has been collected and analyzed through a systematic, objective, and well-designed process, and is not just hearsay). When identifying highly vulnerable habitats, their value to ETP species shall be considered, with habitats essential to ETP species being categorized accordingly.</i></p>	Yes
<p><i>12.2.8 There is a mechanism in place that allows the establishment of outcome indicator(s) consistent with achieving management objectives for avoiding, minimizing, or mitigating impacts on essential habitats for the stock under consideration and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.</i></p>	Yes
<p><i>12.2.9 There is a process that accounts for the most probable adverse impacts of the unit of certification on the ecosystem. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations (proxies) can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures. If information has been utilized from generic evidence based on similar fishery situations, then, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP species or bycatch of non-target fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.</i></p>	Yes
<p><i>12.2.10 There is a process to allow for drafting effective outcome indicator(s) consistent with achieving management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhancement activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. There is also a process that states modifications to the habitat for enhancing the stock under consideration are reversible and do not cause serious or irreversible harm to the natural ecosystem’s structure, processes, and function.</i></p>	Yes

12.2.11 <i>There is a process that accounts for the most probable adverse impacts of the unit of certification on the ecosystem. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations (proxies) can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures.</i>	Yes
12.3 <i>There is a mechanism in place by which the role of the stock under consideration in the food web is assessed and monitored, and its relative importance as a prey species is determined. If the species is considered by the fisheries management organization to be an important prey species, there shall be specific management objectives relating to minimizing the impacts of the fishery on dependent predators. The FAO Guidelines require that all sources of fishing mortality on the stock under consideration are taken into account (whether or not it is a prey species) in assessing the state of the stock under consideration, including discards, unobserved mortality, incidental mortality, unreported catches, and catches in other fisheries.</i>	Yes
12.4 <i>There is a mechanism in place that allows the establishment of outcome indicator(s) consistent with achieving management objectives seeking to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. Mortality in Alaska is usually accounted for all removals of given species. The state and federal fish accounting systems operate in depth and make an explicit effort to document all removals to confirm with regulations in force. The assessors shall ensure that all removals are accounted for in the system (fish ticket, eLandings) for stock assessment and management purposes.</i>	Yes
12.5 <i>The appropriate regulations have been implemented.</i>	Yes
12.6 <i>Research is promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities, as applicable to the fishery.</i>	Yes
12.7 <i>There is a process available for the consideration of MPAs as appropriate, as a tool for management.</i>	Yes
Rationale:	Yes

Evaluation Parameter Rationale – Current Status/Appropriateness/Effectiveness	Met? (Yes/No/NA)
12.1 <i>There is evidence that assessments have been conducted to determine the impacts of environmental factors on the target and associated or dependent species (to the stock) in the same ecosystems, and on the relationships among these species. The results of these studies are in sufficient detail to allow informed management of the fishery. This requirement is intended to provide information about the current understanding of the overall marine ecosystem structure and relationships among the various species, coupled with environmental monitoring. More information about the effects of the fishery on specific ecosystem components (e.g., associated bycatch and ETPs species interactions, gear-habitat disturbance, ecosystem and food-webs impacts, etc.) are assessed in the following clauses of this section.</i>	Yes
12.2 <i>None – this is a summary clause and is not scored.</i>	NA
12.2.1 <i>There is evidence that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on main associated species (e.g. recruitment overfishing or other impacts that are likely to be irreversible or very slowly</i>	Yes

<p><i>reversible), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target species with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action is taken. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.</i></p>	
<p><i>12.2.2 There is evidence that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on minor associated species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target species with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action is taken. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.</i></p>	Yes
<p><i>12.2.3 There is evidence that outcome indicator(s) consistent with achieving management objectives for non-target species (i.e., avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible) have been achieved. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.</i></p>	Yes
<p><i>12.2.4 There is evidence that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on ETP species (e.g. negatively impacting rebuilding efforts), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these impacts are monitored and do not impede, slow, or reduce likelihood of recovery of the species to target levels (or other planned outcomes). If such impacts arise, effective remedial actions are taken.</i></p>	Yes
<p><i>12.2.5 There is evidence for established outcome indicators (e.g., in a fishery management plan or other regulation) seeking to ensure that ETP species are protected (through States or international regulations) from adverse impacts resulting from interactions with the unit of certification and any associated enhanced fishery activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored. Overall, fishing activity does not impede, slow, or reduce likelihood of recovery of the species to target levels or other planned outcomes. Management objectives shall be achieved accordingly. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.</i></p>	Yes
<p><i>12.2.6 There is evidence that the fishery management organization considers the most probable adverse impacts of the unit of certification on habitats, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, if these impacts are likely to be irreversible or very slowly reversible, effective remedial action is taken (please see Appendix 1 part 5, noting specifically the 3 habitat assessment elements, and part 7 for cumulative effects evaluation). Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.</i></p>	Yes
<p><i>12.2.7 Successful management measures have been developed and are in place to achieve the objectives described in the process parameter.</i></p>	Yes
<p><i>12.2.8 Successful outcome indicators and management measures have been developed and are in place to achieve the objectives described in the process parameter.</i></p>	Yes
<p><i>12.2.9 There is evidence that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on the ecosystem (e.g. food-webs effects), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these impacts are likely to be irreversible or very slowly reversible; or effective remedial action shall be taken. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored. There are policies in place (e.g., harvest control rules) that are effective at protecting ecosystem functioning and accounting for species' ecological role, and precautionary and effective spatial management is used (e.g., to protect spawning areas, prevent localized depletion, and protect important foraging areas for predators of fished species) if applicable.</i></p>	Yes

<i>The bait used to capture the stock under consideration shall not be formally classified as ETP species (by Alaska or other international designations), and the fishery under consideration does not hinder recovery or rebuilding of overfished species that are not formally classified as ETP species and used as bait.</i>	
<i>12.2.10 There is evidence for outcome indicator(s) consistent with achieving management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhancement activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure, processes, and function. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.</i>	Yes
<i>12.2.11 There is evidence that the fishery management organization considers the most probable adverse human impacts of the unit of certification on the ecosystem, by assessing and, where appropriate, addressing and or/correcting them, taking into account available scientific information and local knowledge. Accordingly, these impacts are likely to be irreversible or very slowly reversible; if so, effective remedial action shall be taken. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.</i>	Yes
<i>12.3 Management measures have been developed and are in place to achieve the management objectives described in the process parameter, and there is evidence to demonstrate that they are successful to this end. If the species under assessment is not considered to be a key prey species, then this parameter shall be considered fulfilled.</i>	Yes
<i>12.4 There is evidence that outcome indicators and management measures have been developed, are in place, and have succeeded in achieving the objectives described in the process parameter.</i>	Yes
<i>12.5 These regulations and their enforcement are effective and in line with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).</i>	Yes
<i>12.6 There is evidence for this research, and is it considered appropriate for overall fisheries management purposes.</i>	Yes
<i>12.7 There shall be evidence for the use of MPAs, if appropriate (e.g. if they are employed MPAs as part of suite of management tools), as a tool for effective management with the general objectives of ensuring sustainability of fish stocks and fisheries, and protecting marine biodiversity and critical habitats.</i>	Yes
Rationale:	

Evaluation Parameter Rationale – Evidence Basis	Met? (Yes/No/NA)
<i>12.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization assesses the impacts of environmental factors on target and other species belonging to the same ecosystem or associated with or dependent upon the target species, and the relationship among the populations in the ecosystem. Examples may include various stock and ecosystems assessment reports.</i>	Yes
<i>12.2 None – this is a summary clause and is not scored.</i>	NA
<i>12.2.1 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on main associated species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these nontarget species with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly</i>	Yes

<p><i>reversible. If such impacts arise, effective remedial action is taken. Examples may include various stock and ecosystems assessment reports.</i></p>	
<p><i>12.2.2 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on minor associated species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these nontarget stocks with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action is taken. Examples may include various stock and ecosystems assessment reports.</i></p>	<p>Yes</p>
<p><i>12.2.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicator(s) consistent with achieving management objectives for non-target species (i.e., avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible). Examples may include fishery management reports, and stock or ecosystems assessment reports.</i></p>	<p>Yes</p>
<p><i>12.2.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on ETP species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these nontarget stocks with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action are taken. Examples may include various stock and ecosystems assessment reports.</i></p>	<p>Yes</p>
<p><i>12.2.5 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicators seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and any associated enhanced fishery activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Examples may include fishery management plans, or stock and ecosystems assessment reports.</i></p>	<p>Yes</p>
<p><i>12.2.6 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on habitats, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target species with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action is taken. Examples may include various stock and ecosystems assessment reports.</i></p>	<p>Yes</p>
<p><i>12.2.7 Successful management measures have been developed and are in place to achieve the objectives described in the process parameter.</i></p>	<p>Yes</p>
<p><i>12.2.8 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicator(s) consistent with achieving management objectives for avoiding, minimizing, or mitigating impacts on essential habitats for the stock under consideration and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. Examples may include various regulations, data, and reports.</i></p>	<p>Yes</p>
<p><i>12.2.9 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on the ecosystem, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target stocks with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action is taken. Examples may include various stock and ecosystems assessment reports.</i></p>	<p>Yes</p>
<p><i>12.2.10 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicator(s) consistent with achieving management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhancement activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are reversible and</i></p>	<p>Yes</p>

<i>do not cause serious or irreversible harm to the natural ecosystem's structure, processes, and function. Examples may include various regulations, data, and reports.</i>	
<i>12.2.11 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on the ecosystem, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target stocks with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action is taken. Examples may include various stock and ecosystems assessment reports.</i>	Yes
<i>12.3 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the role of the stock under consideration in the food web is considered, and if it is a key prey species in the ecosystem, objectives and management measures are in place to avoid severe adverse impacts on dependent predators. Examples may include various stock and ecosystem assessment reports.</i>	Yes
<i>12.4 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicator(s) consistent with achieving management objectives seeking to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. Examples may include various stock and ecosystems assessment reports.</i>	Yes
<i>12.5 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the State has introduced and enforces laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). Examples may include various regulations, data, and reports.</i>	Yes
<i>12.6 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that research is promoted on the environmental and social impacts of fishing gear especially the impact of such gear on biodiversity and coastal fishing communities. Examples may include various regulations, data, and reports.</i>	Yes
<i>12.7 The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization has made use, where appropriate, of MPAs. The objectives of establishing MPAs are ensuring sustainability of fish stocks and fisheries, and protecting marine biodiversity and critical habitats. Examples may include various regulations, data, and reports.</i>	Yes
Rationale:	

	Starting score - (Number of EPs NOT met x 3) =		Overall score
Numerical score:	10	0	10
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)			High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)			Full Conformance
Non-conformance Number (if applicable):			N/A

Fundamental Clause 13

Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.

No Supporting Clauses under Fundamental Clause 13 were applicable because the fishery under assessment does not use fisheries enhancement techniques.

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